

# Slow Moving and Dead Stock: Some Alternative Solutions

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**ABSTRACT:** Slow-moving and dead stocks have been a classic problem of ceramic tile industries. Different varieties of ceramic tiles have the potentials of remaining as dead stock. Thus, this study is aimed at exploring some preventive alternatives and solutions in overcoming slow-moving and dead stock. Quite many companies experience similar problems, and companies take creative solutions. Semi-structured interviews, non-participant observation, and documentation analysis are data collection methods used in this study. This study showed that the demand forecast is a strategy to avert dead stock. In addition, the solution for the past dead stock is that additional services should be provided to the customers by initiating sales of ceramics with beautiful patterns and being committed to social responsibility activities through giving away the dead stock of ceramics to factory laborers or marginal communities who are renovating their houses.

*Keywords:* Slow-moving inventory, dead stock, ceramic.

## 1 INTRODUCTION

The change in the paradigm of inventory from valuable assets to worthless assets forces a company to vary its business process innovation. Companies that have not implemented a just-in-time system have to prepare process innovation that focused on minimizing inventory and avoiding deadstock (Pinçe & Dekker 2011, Van Jaarsveld & Dekker 2011).

Previous studies showed that the main reason for slow-moving and dead stock is the low or rare demands for goods (Mobarakeh et al. 2017, Petropoulos et al. 2019), excessive stocks (Escalona et al. 2019, Matsebatlela & Mpofu 2015), seasonal product (Panda et al. 2008), design errors that make these goods unsold (Fan & Zhou 2018), and the lack of follow-up initiatives for stocks with low turnover (Chuang & Zhao 2019). Slow-moving and dead stocks certainly affect the newness or the obsolescence of the products and the huge carrying cost of stock (Fan & Zhou 2018, He & Wang 2019). Thus, slow-moving and dead stocks should be anticipated, and when they occur, these stocks should be wisely handled as not to impact the company's finance negatively.

Manufacturing companies have three types of inventories, namely, raw materials, work in process and finished good inventory. Each type of inventories requires appropriate inventory management (Chuang & Zhao 2019; Lee 2005, Rozhkov & Ivanov 2018, Tsourveloudis et al. 2000). The study focuses on finished goods inventory since finished goods inventories are the largest portion in PT. "SK" as one of the largest ceramic tile companies in East Java. The uniqueness of the stocks that PT. "SK" has is that even though there are few quantities of stocks per design type, it owns millions of designs and colors. This study, thus, is aimed at exploring inventory management of the company in efficiently minimizing costs of slow-moving and dead stocks.

The study contributes significantly to business people in a creative way in overcoming dead stock. The contribution is also to provide insights to social responsibility activists that quite a few company resources are without added value for the company. However, these resources can be used to help marginal communities. In addition to that, the study can have positive impacts on other researchers to explore the solutions of slow-moving items and deadstock further more creatively.

The study starts with an introduction related to the background, the objective, and the significance of the study. The second part of the paper focuses on the literature review, and then, the paper continues to in-depth research methodology process. The next sections are about findings and their analysis closed with the conclusion and limitations and prospects of future studies.

Inventory has been an essential asset for a company and has been used as a bumper over uncertainty of market demands (Chuang & Zhao 2019, Nemtajela & Mbohwa 2017), unreliability of material supply (Van Jaarsveld & Dekker 2011), price protection (Gavirneni 2006), quality discount, and lower ordering cost (Cárdenas-Barrón et al. 2018, He & Wang 2019). In contrast, since stocks contained non-value-added costs, it should be minimized (Tayyab & Sarkar 2016). Thus, the company should be able to balance the needs and the costs of inventory.

Slow-moving inventory is stocked, which is considered very slow in its circulation and distribution volumes (Dolgui & Pashkevich 2006, Pinçe & Dekker 2011, Snyder et al. 2012). Deadstock is an unsold stock and stored in a warehouse for a long time (Snyder 2002). The stipulation of slow-moving inventory dan dead stock criteria is different for different companies because these criteria are based on the managerial judgment that is influenced by the type and the characteristics of a business. Inventory that remains unsold beyond six months is categorized as slow-moving inventory, and inventory above one year is categorized as deadstock (Goh & Lim 2014).

Slow-moving and dead stocks contain quite high non-value-added costs, among which are warehouse cost, maintenance cost to preserve the quality of the stock, repair cost, and opportunity cost. This high non-value-added cost can be avoided using various approaches in forecasting demands more accurately (Chuang & Zhao 2019, Dolgui & Pashkevich 2006). In the meantime, to overcome slow-moving and dead stock, sales promotion can be intensified using the price reduction, premiums, bonus product, lotteries, and coupons, sample, and lump-sum sales or donation.

## 2 RESEARCH METHODS

The study is applied research with an analytical approach (Silverman 2000). The research problem of the study is how slow-moving and dead stocks are solved to streamline the cost of the finished goods inventory at a ceramic tile company. The scope of

this study is on the finished goods inventory. It is based on the consideration that the composition of the finished goods is approximately 70% of the total stock. The subject of the study is one of the ceramic tile companies in East Java, named PT. "SK". The selection is based on the vulnerability of the product regarding slow-moving and dead stock issues. The data were collected using interviews, documentation of the process, and observation of the sales activities and production plan of the company.

Semi-structured interviews were conducted with sales manager, production manager, accounting and finance manager, warehouse division head, and PPIC division head. The interview questions were related to demand forecasting, sales forecasting process, aspects considered in forecasting, demands, production planning, logistics, inventory costs, carrying costs, and other inventoriable costs along with activities conducted to overcome slow-moving and dead stock. The interviews were conducted 15 times with the duration of each interview between 45 minutes and 3 hours.

The non-participant observation was done by observing the process of the flow of receipts of goods from production division, the process of structuring and releasing goods, scheduling plans, and production and marketing plans, along with meetings regarding the handling process of slow-moving and dead stock. The observation was conducted seven times, with the total time spent 15 hours. The document analysis was applied to inventory stock cards, product costing, inventory cost, carrying cost, production schedules, and sales forecasts.

After the data had been collected, data processing and analysis is done. The triangulation method was used to test the validity and reliability of the data (Silverman 2000). The data processing was started with the classification of the inventory for every type of ceramic tile. Afterward, the stock card was analyzed and classified into slow-moving and dead stock. Then, it was continued with the observation and the measurement of inventory storage space, inventory cost analysis, and minutes of sales and production meetings. Next, an aggregate analysis of the data was also conducted. At the final stage, discussions related to alternative current and future solutions to the problems were carried out by the company.

## 3 RESULTS AND DISCUSSIONS

Slow-moving inventory is categorized as a warehouse stock of 6 to 12 months old (Dolgui &

Pashkevich 2006, Pinçe & Dekker 2011). Meanwhile, deadstock is a warehouse stock of more than one year old with no mutation at all (Snyder et al. 2012). Slow-moving inventory, which is not immediately addressed, have a chance of being dead stock, and this stock will be soon obsolete (Goh & Lim 2014). For the ceramic industry, stock inventory has been a classic problem. The head of the production mentioned that slow-moving inventory potential indicators could be traced from stock cards at the warehouse where the stock leaving the warehouse divided by the available stock is less than 30%.

Slow-moving inventory and dead stock in PT. "SK" are caused by internal factors, such as (1) error of the warehouse that lacks discipline in updating stock cards, (2) mistake in estimating sales demand. This is due to the lack of careful marketing and less attention to external and internal factors that will affect future sales demand and impact on making the sales forecast to be less precise, (3) IT mastery limitations that result in the company not using computerized system and concepts that can help improve the accuracy of demand forecasting, and (4) employee's capability limitations that result in a lack of understanding of quality standards and policies, ceramic quality targets and the worst of all, the existence of an overproduction tolerance by the management to prevent stockout. The management believes that in-demand fluctuation should be anticipated using sufficient inventory. Moreover, there are several other reasons for the production bottlenecks, such as broken machines, exhausted materials, and manufacturing company's labor problems that are responsible for the company's problems with stocks. All these situations are in line with the previous studies confirming the numerous internal factors responsible for slow-moving inventory and dead stock (Fan & Zhou 2018, He & Wang 2019, Matsebatalela & Mpofo 2015).

Aside from internal factors, external factors also trigger the occurrence of deadstock, among which are the development of the design trends and colors requiring the company's quick responses. The rapid development of the design trends and colors results in shorter product life cycles. The shorter the life cycle is, the more rapid the planning, scheduling, and production execution (Nemtajela & Mbohwa 2017, Snyder 2002). Based on the production planning schedule, it can be seen that new types of ceramic tiles are produced monthly. Adaptive and responsive actions are required to boost customer satisfaction and company sales. However, this condition does not apply to classic design, for example, white ceramic tiles. White ceramic tiles are

considered as classic ceramics since it is needed at all times.

Slow-moving inventory and dead stock may incur higher costs of inventories, especially on its transporting cost (Goh & Lim 2014, Lee 2005). Based on the company's records, 39 ceramic types are slow-moving inventories with storage duration between six and twelve months. Seventeen types of dead stock with storage duration over 12 months and some others with storage duration of about four years have also been detected.

Table 1. Slow Moving and Dead Stock

Inventory	Quantity (in box)
Slow Moving Inventory	15,967 boxes
Dead stock	3,335 boxes

The more the quantities of slow-moving items and dead stock are, the more the holding costs the company has to spend. In addition to the cost of money that depends on the cost of the product, the embedded cost in the stock relates to warehouse expenses, repacking, fumigation, and opportunity cost. Warehouse rent expense is calculated by measuring the stock storage area, multiplying it by rent expense per square meter. Fumigation expense is the cost of spraying pests, bugs, and termites since they destroy box packing and pallets. The spraying is conducted every six months. Repacking expenses for the cost of the boxes for inner and outer boxes should also be considered when some stocks are defected, corrupt, or damaged. Opportunity cost is money embedded in inventory that should have been spent on other investments to gain a higher return. Opportunity cost should also be considered when the capital invested in slow-moving stocks is going with very slow turnover, even if the available stocks have turned into dead stocks, and the invested capital has no more turnover. The summary of slow-moving inventory and dead stock expenses is indicated in Table 2 and Table 3.

Of all these meticulous calculations, it is obvious that there are huge costs spent by the company, and these costs are periodic in nature, except for the product-related costs. Product costs are imposed when those products are totally unusable and/or defected. The rental costs of the warehouse, the fumigation, and the packing and opportunity costs borne by the company are avoidable as long as the company management abides by good practices of demand forecasting. The proper forecast of the demand may result in the improvement of the accounting system, the quality of human resources, and the support of information technology. PT. "SK" has been using an accounting service and bought accounting software

for their accounting and financial processes. The accounting system is revisited annually.

Table 2. Slow-Moving Inventory Cost

Cost	Slow-Moving Inventory	
	Size	Total Cost
Monthly warehouse rent	Warehouse area = 73,614 m <sup>2</sup>	Rp 7,361,400
Fumigation cost	Warehouse capacity = 451m <sup>3</sup>	Rp 6,765,000
Packing cost	Number of boxes = 16,661	Rp 44,657,133
Product cost (when unsold)	Number of boxes = 16,661	Rp 624,154,000
Opportunity Cost		Rp 45,429,490

Table 3. Dead Stocks' Cost

Cost	Dead Stock		
	Size		Total Cost
Monthly warehouse rent	Warehouse Area = 16,621 m <sup>2</sup>		Rp 1,662,100
Fumigation cost	Warehouse Capacity = 102m <sup>3</sup>		Rp 1,530,000
Packing cost	Number of boxes = 3,335		Rp 11,349,586
Product cost (when unsold)	Number of boxes = 3,335	Total Cost =	Rp 117,082,500
Opportunity Cost			Rp 33,483,517

The demand forecasting process precisely requires three essential stages, namely, design issues, specification issues, and evaluation issues (Boylan et al. 2014). The first stage is the design issues. At this stage, the logistics manager and the sales manager define the process of and the demand forecasting objectives. The main reason for the sales forecast is to be able to predict future customers' demands. The results of the sales forecast are communicated to the production division in order to plan production to minimize slow-moving inventory.

The second stage is the specification issues using the application of the judgmental method. At this stage, the sales manager requests recapitulations of stock cards weekly and monthly from the warehouse. These data are combined with market research to interpret consumer behaviors. Besides, every week, the sales division of PT. "SK" holds regular meetings. During these meetings, the salesmen are asked to inform the company regarding their observations regarding the customers and the competitors. The sales division also searches for information about trends and designs in the future by seeing the trends and the designs of ceramic tiles abroad. From these meetings, customers from

outside Java prefer strikingly bright designs, while those from Java prefer classic designs and colors.

The purchases from customers outside Java result in preventing dead stock because these consumers tend to buy PT. "SK" stocks as a whole. However, the distance between customers' warehouses and the company's warehouse is the primary concern. Thus, in every launch of a new ceramic tile type, the salesmen from the company will offer designs within or outside Java. When the consumers outside Java make new orders, the management will not be reluctant to produce the order, including calculating the proportion of poor product tolerance. The company's customers outside Java do not even mind if PT. "SK" delivers more goods beyond their orders. This condition is very different from when the company handles customers in Java. PT. "SK" often makes decisions to produce order-based ceramic tiles for customers from Java without allowance for bad stocks. This is because customers from Java are not going to accept excess of goods, especially when the company overproduces the tiles.

The last stage is evaluation issues, where the management makes a judgment of the demand forecast. This demand forecast then is socialized to all the departments in the company, especially the production department, purchasing department, and finance department. The socialization is aimed at communicating and coordinating among departments. The readiness of the production capacity, the adequacy of the material supply, and the readiness of the cash flow play essential roles in the success of the sales of PT. "SK". The revision in the drafting of the demands should be integrated. However, PT. "SK" should not ignore the slow-moving inventory and dead stocks that have been occurring and will possibly occur in the future even in the smaller amount.

Slow-moving inventory and dead stock, which has been happening are handled in the corporate management using very creative approaches. One of the approaches is made by preparing designs of floors and walls by mixing various types of ceramic tile designs. Providing the designs of the images that match the area of a room is additional customer service. This method is considered to be highly useful to terminate slow-moving inventory. Approximately 60% of the slow-moving inventory has been sold out. The cost-benefit analysis of the design cost is implemented, and a designer's salary is more inexpensive than the cost of slow-moving items and dead stock. The CEO also stated that post evaluation, there is a potential to establish a ceramics design division to solve slow-moving items and deadstock; and to provide better services to consumers.

Dead stocks that have not been sold, after 12-month storage, have partly been on sale, and the rest of them have been given away in corporate social responsibility programs. PT. "SK", through its general affairs department, opens an opportunity to factory laborers or marginal communities to come and get ceramic tiles for free with requirements that the tiles must be used for their house renovation and not to be resold. The last thing to be done on dead stocks is to donate them to marginal communities with the agreement to do good words of mouth. This is aligned with the statement from the director of PT. "SK" stating that social responsibility should be based on the win-win concept. This means that the donations should benefit both marginal communities and the company because the receivers of the ceramic tile donations are going to spread the donations on both the social media of the receivers and the company. This will also positively impact the company.

#### 4 CONCLUSION

The results of this study showed that slow-moving inventory and dead stocks occur because of the inaccuracy in demand forecast resulting in inaccuracy in production planning or forecast. Furthermore, the limited capabilities of human resources and information technology significantly impact on the business. As a consequence, the company has to be accountable for high inventory costs. The initiative to reduce slow-moving and dead stocks is taken by improving the current system, human resource capabilities, and information technology. Another creative solution can be in the form of giving additional services to customers and creating win-win social responsibility programs for the company and its customers.

The study focuses on exploring and explaining possible solutions that the company may implement in solving dead stock problems. The limitation of the study is due to research subjects confined to the slow-moving and dead stocks of the finished products only. In addition, the cost of inventory calculation is based on the four types of costs traceable in accounting records. Thus, future research may be expanded to an in-depth discussion of all types of inventories and the cost of inventory traceability by considering both the direct and indirect costs of a product.

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