# Inventory management systems of small and medium enterprises in Bangladesh

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## Abstract

**Purpose** – Inventory is a crucial part of a systematic supply chain of a business. Small firms mostly neglect inventory management (IM) by accumulating excessive inventory for a time. The study aims to examine the IM practices of small and medium enterprises (SMEs) in Bangladesh.

**Design/methodology/approach** – The study applied a qualitative case study design. Data were collected from ten SME owners in Bangladesh. The study employed a purposive sampling technique to collect data. This study used semi-structured interviews to generate data. The NVivo software was used to analyze the data.

**Findings** – The findings show that most SME business owners collect raw materials from the local market. Along with the local sources, they collect raw materials from international markets. Some SME entrepreneurs collect raw materials throughout the country as they dealt with recycled products. Frequently, they used digital technologies and online media to manage raw materials. SME owners could not buy many raw materials due to financial crisis, wastage, and damage, leading to a ratio of 10–15% losses.

**Research limitations/implications** – This research contributes greatly to the government, SME Foundation, and trade associations concerning the SME IM system. The study recommends the government should reduce the tax rate on importing SME raw materials and inventories and exporting SME products.

**Originality/value** – This is the first study that focuses on the IM systems of SMEs in Bangladesh.

**Keywords** Inventory management, SME, SME owners, Qualitative research, Bangladesh

**Paper type** Research paper

## 1. Introduction

Inventory is a crucial part of a systematic supply chain of a business. It is used to balance the supply and demand of a specific product. Effective inventory management (IM) can lead to higher revenue and profits. Small firms mostly neglect IM by accumulating excessive inventory for a time with cash tied in it, and it leads to the inability to control the flow of inventory effectively (Bai and Zhong, 2008). These small and medium enterprises (SMEs) hold an important place in both developing and developed countries by contributing

significantly to the national economy (Visvanathan and Kumar, 1999). For the development of the national economy, SMEs can play an essential role in increasing productivity, efficiency and fair competition. To survive in today's competitive business environment, SMEs should emphasize increasing their competitive advantage through low-cost but high-quality product offerings in line with their limited resources (Scully and Fawcett, 1994). It can be done by using effective IM, enabling a firm to manage and minimize inventory to acquire competitiveness over the other rival firms in the market (Sprague and Wacker, 1996). An effective IM system can be integrated with capacity utilization to increase quality and reduce cost for better competitiveness (Ricklavely, 1996). Orobia et al. (2020) specified a significant relationship between IM and the financial performance of small firms. Effective IM practices can become helpful for SMEs to ensure financial soundness. Karadağ (2018) found that receivables management and cash management are strongly associated with financial performance though the association of IM was found relatively weaker. So, there are differences in the findings on the influence and association of IM practices on SMEs' business operation and financial performance. It necessitates further exploring the dynamics of SMEs' IM practices for better understanding.

In Bangladesh, the relative market share of SMEs in the manufacturing sector is very significant, which was reported 40–50% of the total value added generated by the sector (Alauddin and Chowdhury, 2015). A recent study conducted by the Japan Bangladesh Chamber of Commerce and Industry (JBCCI) reported that there are 17,384 micro-enterprises, 15,666 small firms, 6,103 medium firms in Bangladesh 3,639 large-scale enterprises (Rahman, 2021). The number of SME firms has been increasing in the last two years due to the declaiming role of ready-made garments (RMG) and remittances in the economy of Bangladesh. Collectively, the contribution of these SMEs may get prominence in the next few years if these firms can manage themselves with proper nurturing and efficiency. To encourage and persuade entrepreneurial activities, SMEs can be a primary source of business interest, and they can contribute to the national economy to a large extent.

Ensuring these enterprises' rapid and sustainable growth can alleviate poverty and generate employment. More than 50% of industrial enterprises are SME-sized, and it has low capital intensity and high labor intensity compared to other large-scale enterprises (Alauddin and Chowdhury, 2015). In terms of employment generation, SMEs have been predominant by employing about 24 million people in the last year (Hossain, 2021). The problems of SMEs can be addressed to avoid the failure of the operation of SMEs primarily by considering the importance of economic growth and poverty alleviation (ILO, 2010). The solution in such cases is to manage the demands of raw materials and other inputs of the SMEs, which can be achieved by proper IM (Baron et al., 2011). For SMEs, inventory has significance, especially for the manufacturing industry. It enables an enterprise to reduce costs initially and maintain proper stock to meet the demand for the market and in-house needs for raw materials and other inputs (Rajeev, 2008).

SMEs usually confront two types of IM problems, which are excess inventory and shortage of input materials in the business. Rajeev (2008) suggested the need for managers in the machine tool sector to drastically alter their approach (i.e. use of rule-of-thumb) to IM. Rajeev (2008) states that the major problems of the managers in inventory management are the use of rule-of-thumb for inventory management (IM), low importance given to forecasting, random ordering of materials, low levels of training and development, and low computer use. By maintaining safety stock and timely ordering materials, the owners can solve these problems in the short run, but there should have an inventory management practice for long-run success. SMEs take inventory management decisions based on intuitions and lack proper professional knowledge, which ultimately leads to massive inventory investment and maintenance. SME owners design their inventory policies and strategies based on the buyers' demands, industry practices, predictions and estimates, and accessible production capacity (John et al., 2015).

Considering the limited literature on SME inventory management in Bangladesh, the study aims to examine the inventory management practices of SMEs in Bangladesh. This study can contribute to the existing literature in several ways. This is the first study that explores the inventory management system of SMEs in Bangladesh. The study extends the literature concerning the developing country perspective of SME inventory management systems. The study findings are hoped to be beneficial for SME regulators and stakeholders in Bangladesh as it is the first of its kind.

By adopting a qualitative case study design, this study finds that most SME businesses owners collect raw materials from the local market. In addition, they collect raw materials from the international markets. Some SME entrepreneurs collect raw materials throughout the country as they dealt with recycled products. Sometimes, they use digital technologies and online media to manage raw materials. SME owners could not buy many raw materials due to financial crisis, wastage and damage, leading to the ratio of 10–15% losses.

The paper is structured as follows. Section two provided relevant literature review, section three discussed the methodology, section four illustrates findings, section five narrates discussions and section six concludes the paper.

## 2. Literature review

Inventory management is an essential part of making all the decisions in handling the inventory in an organization such as activities to be carried out, policies of inventory management and procedures in handling the inventory to ensure enough quantity of each item is kept in the warehouse at all times. Inventory management is the building block of the supply chain house; it is the fluid that lubricates its wheels (Wild, 2017). Inventory is an essential factor in SME production costs to boost competitive advantage (Hasbullah *et al.*, 2021). Singh and Verma (2018) highlighted the scope of inventory management that covers many topics, such as replenishment scheduling, managing costs of storage and inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space, quality management, replenishment, returns and defective goods, and demand forecasting. Inventory is essential in manufacturing production costs (Hasbullah and Santoso, 2020). The existence of inventory will cause certain risks that the company must bear due to the stock (Rossit *et al.*, 2019). The fluctuations and risks of mismatch predictions with actual demand impact on changes in production planning made so far (Shao *et al.*, 2021). Safety stock determines how much inventory is needed during the Grace period in meeting the amount of demand (Godichaud and Amodeo, 2019). Inventory management can play a positive role in small firms' growth. This has brought important messages that the input markets and the business environment in Vietnam have not yet stimulated well-economic activities, so they exploit and create additional financial resources such as borrowing to consolidate their endogenous resources (Park *et al.*, 2020).

The suppliers also have scarce resource sources in the import of raw materials. In this way, synchronizing demand and supply is becoming a pressure point for small businesses (Muchaendepi *et al.*, 2019). Atnafu and Balda (2018) found that a higher level of inventory management technique can improve competitiveness and lead to higher organizational performance. An effective technique for inventory management should analyze the cost associated with different levels of inventory. A SME should optimize its inventory with the cost for effective stock management to expedite a dependable forecast of sales (Atrill, 2006).

Many factors may affect inventory management effectively. These factors include the seasonality of demand and supply dynamics, related batch sizes, and the necessity of keeping buffer stock for meeting supply uncertainty (Cachon and Olivares, 2010). Three trends were identified for understanding the logistics solution, one of these trends was proper integration

of logistics activities can reduce the material flow cost and also the cost of inventory maintenance (Hakansson and Persson, 2004). In another study, it was found that supply chain management comprises three important components, which are effective management of customers, utilization of organizational resources and efficient use of inventory (Singh and Kumar, 2020).

The inventory investment for a small business takes up a big percentage of the total budget, yet inventory control is one of the most neglected management areas in small firms. Many small firms have an excessive amount of cash tied up to the accumulation of inventory sitting for a long period because of slack inventory management or the inability to control the inventory efficiently. Rajeev (2008) found major problems in the inventory management practices of small businesses based on machine tool production. The problems include using the rule of thumb for IM, lack of forecasting, frequent ordering of materials, inadequate training and development, low use of information technology and also negligence in managing the purchase and variable lead time. The study confirmed the need for managers in the machine tool sector to alter their approach to inventory management drastically. Karim et al. (2018) revealed that a company practices risky inventory management in keeping stock, as it relies heavily on third-party warehousing services beyond the company's control. This study also revealed that the standard operating procedures are too general and lack specificity. However, poor inventory management has a modest influence on the company's financial performance. Poor inventory management translates directly into strains on a company's cash flow (Bai and Zhong, 2008).

To manage inventory at an optimum level, the main challenge is the difficulty faced to forecast demand and targeting customers' expectations of product availability in the market (Coyle et al., 2003). The challenge in managing inventory is to balance the supply of inventory with demand. A company would ideally want to have enough inventories to satisfy the demands of its customers-no lost sales due to inventory stock-outs. On the other hand, the company does not want too much inventory to stay on hand because of the cost of carrying inventory (Coyle et al., 2003). An increase in inventory efficient use gives a jump-start to small business economic efficiency growth. Application of the system approach to inventory management allows monitoring of the whole material flow process and minimizes randomness of this process. For managing optimum inventory level, material flow needs to be streamlined and understood as a system for a consolidated integration among material, financing and information flow (Viktorovna and Ivanovich, 2016a, b).

Managing shelf space is important for controlling inventory and stock management. It has a strong impact on stock-outs and the allocation of shelf space should be decided based on case pack quantity and also consider the demand of customers in the market (Eroglu et al., 2011). Deloof (2003) established that shortening the inventory conversion period is a precursor to increasing stock out costs and will eventually result in loss of sale opportunities hence poor performance. Juan and Martinez (2002), in their study of 8,872 small and medium-sized Spanish firms, also demonstrated that managers of firms could create value by reducing the number of days of inventory. Effective inventory management processes help to increase the operational efficiency of firms, improve customer service, reduce inventory and distribution costs, and enable businesses to track items and their expiration dates, consequently balancing among availability and demand (Pandey, 2004).

## 3. Methodology
The study aims to investigate the inventory management systems of small and medium enterprise businesses in Bangladesh. For collecting the necessary data, Dhaka, the capital city of Bangladesh, was selected. This geographical location was used in this study as this area is the dominant commercial hub in Bangladesh and most of the head offices of the

businesses are located in the center of the city. Among the different types of businesses, SMEs businesses are considered the prime concern of an economy. This research applied a qualitative case study method in attaining the research objective. The study selected the purposive sampling technique to select the respondents. A SME fair was organized in 2019 by the SME Foundation Bangladesh for showcasing and facilitating SME activities. The researchers interviewed 10 attendees who participated in the fair.

The respondents were selected based on several criteria. First, they were familiar with SME businesses and their actions. Second, they are associated with the training, monitoring and motivational programs of the rural, route, and town levels SME business owners. Third, the respondents participated in the last SME fair arranged by the SME foundation of Bangladesh. Finally, they have diversified clusters as per the SME foundation's price-giving categories. In the following Table 1, a brief background of the participants is illustrated:

The researchers reached the saturation point at ten respondents, as most of them were trainers for SMEs. The required number of participants was reached when the point of saturation was achieved, whereby analysis of additional interviews led only to aspects that had already been mentioned in previous conversations and did not result in new findings (Creswell, 2006; Alam, 2021).

The tool for data collection was semi-structured interviews, which were conducted by the researchers. A semi-structured interview is defined as a tool of data collection, where questioning is guided by certain themes in a consistent and systematic structure with an interposed attempt to produce elaborative responses from interviewees with the help of probing and repeat questioning (Qu and Dumay, 2011). Miles and Huberman (1994) proclaimed that the

| Sl | Participant ID | Position | Organization | Gender | Education | Experience (Years) | Number of employees |
|---|---|---|---|---|---|---|---|
| 1 | Participant # 1 | Owner | Loom Silk and Sharee, secretary of the federation | M | Secondary | 40 | 40–45 |
| 2 | Participant # 2 | Owner | Paper cup (green management) | M | Post-Graduation | 4 | 10 |
| 3 | Participant # 3 | Owner and SME trainer | Jute, handcrafts, chairman of the Federation | F | Post-Graduation | 15 | 40 |
| 4 | Participant # 4 | Owner and SME trainer | Block and Batiks and trained more than 1,000 | F | Graduation | 16 | 43 |
| 5 | Participant # 5 | Owner | Handicrafts and batiks | F | Degree | 23 | 4 |
| 6 | Participant # 6 | Owner and SME trainer | Organic Agri products and trained more than 4,000 farmers | M | Post-Graduation | 30 | 40 |
| 7 | Participant # 7 | Owner | Jute textile and federation secretary | M | Post-Graduation | 30 | 56 |
| 8 | Participant # 8 | Owner and SME trainer | Jute products and trained more than 30,000 | F | Post-Graduation | 18 | 21 |
| 9 | Participant # 9 | Owner | Furniture and cottage | M | Graduation | 5 | 10 |
| 10 | Participant # 10 | Owner | Varieties | M | Higher Secondary | 30 | 10 |

**Table 1.**
Background of the participants

semi-structured interview method could elicit a real description from respondents of a focused field of study. Moreover, as the study is related to money matters, the interview method is comparatively a better choice. The themes of questioning were developed after an extensive review of literature in the relevant field of the study, including different aspects of inventory management, planning, monitoring and control of inventory, etc.

After taking permission from the respondents, all successful interviews were recorded initially and then transcribed, and finally, various memos were written for analyzing the information collected. The length of the interviews was 45–60 min each. These interviews were conducted both online and offline. For online interviews, a zoom meeting application was used. The zoom method is easier as it minimizes the cost of money, is time-saving and is easier to record. In addition, this approach is easier to understand the views and expressions as it has the opportunity to video record compared to an audio recording or tape recording. The other interviews were done through a face-to-face meeting with respondents. The interview sessions were recorded after taking permission from the participants. There were both audio and video formats of interviews. The recorded interviews were first transcribed and then summarized to analyze various insights, which are related to the subject matter of the study. The number of completed interviews was 10. The interviewees were experts on SME operation and management. They have 4–40 years of experience in running and managing SMEs in Bangladesh.
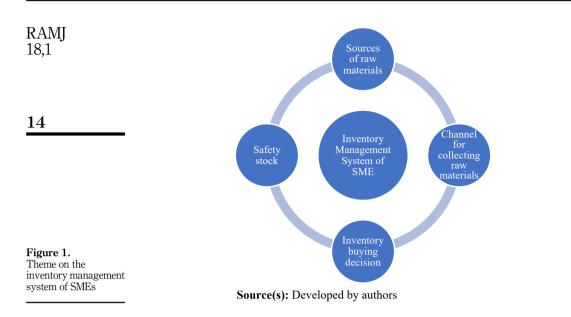
The collected responses from the interviews were examined using content analysis techniques. There were different guidelines set by Miles and Huberman (1994), Pope et al. (2000), Creswell (2006), and Bazeley (2009) to examine data that include certain steps to be followed. Firstly, the collected data were passed into NVivo 11, useful software for content analysis. Each paragraph in the transcript concerning different aspects of inventory management practices of SMEs in Bangladesh was separated and coded. The primary coding was based on a deductive approach. A scheme representing the aspects of inventory management practices was developed by using prior research. There are various types of operational definitions, which were determined to help the coding process. Later, the previously determined categories of inventory management practices were coded into tree nodes. Then, again, all transcripts were reviewed with care for second-level coding. It helped to categorize the text responses into emergent themes. The themes formed are used to create subcategories and codes under each major category of the analysis. In this way, the irrelevant data were eliminated, and data management has become more useful. The subcategories which were developed were done by grouping various quotations collected from the interview transcripts under different subcategories (Alam, 2021). These quotations enabled us to maximize the representation of the participants' views and thoughts.

After completing the entire coding activities, a cross-case analysis was conducted. Various inventory management behaviors of SMEs in Bangladesh were compared for every code. Through this comprehensive process, it was ensured that the categories that had been created for analysis reflected the participants' views and thoughts accurately, instead of the researcher's perspective. It is important to accurately reflect the participants' points of view on the subject matter, and a researcher must be sincere to address the respondents' views of the world properly in the analysis and findings. In the final part of the study, the analyzed data were further evaluated for identifying the presence of any relationship within the data. This was helpful for an in-depth understanding of the subject matter and the meaning of the code statement also.

## 4. Findings
Based on the research question and subquestions concerning the inventory management system of SMEs in Bangladesh, we have developed a theme from NVivo data analysis. The theme has been classified into some categories or subthemes upon the study findings in Figure 1.

Figure 1.
Theme on the
inventory management
system of SMEs



**Source(s):** Developed by authors

*4.1 Local market*
As per the responses, most of the SME owners (participants# 1; 2; 3; 5; 6; 7; 8; 10) collect their raw materials mostly from the local market. Though sometimes there is a shortage of products, this is for a shorter period.

> We don't import; that's different. We bring it from the local market. [Participants # 1] Based on the availability in the market, we buy as per demand and need. If there is a crisis in the market, there is a problem. He brings the goods from those who have them. No, before, when business was profitable, we had no chance to get it home. Now no one gives the rest. [Participants # 1] In the second question, I would say we produce raw materials from the local market. We don't have to depend on anyone. [Participant # 10]

In addition, the owners collect the raw materials online, either by using Facebook or different online websites. Concerning the fact, John *et al.* (2015) outlined that SME owners draw inventory policies as per industry practice and available production capacity.

> A new Suzuki has come an online business. These shops have invested in them. They have to take the raw material, make the product, then come to the showroom and then people go to our showroom and buy it. Now, all the women who are selling clothes online, even my son's wife, also does it. My son's wife used to buy things from big stores, and now she sells them to me. In this case, what will happen to these shops? When I am meeting my needs at home, I don't need to go to shopping centers. [Participant # 3]

One of the respondents narrated that he used foreign raw materials from China, but now he uses local goods though their quality is not satisfactory (Beck and Demirguc-Kunt, 2006).

> After 2019, the Bashundhara Group of Bangladesh started producing some raw materials. But its quality is relatively bad from abroad. [Participant # 2]

Another participant opined that the raw materials could be accessed by the rural entrepreneur as their business depends on rural products. In addition, some SME entrepreneurs collect raw materials from the internal source/local area of the country, as they work with recycled products.

Many times, we have to collect raw materials from small entrepreneurs in rural areas. [Participant #
8] Raw materials have been collected from different places as per our demands. [Participant # 9] It is
available in rural areas rather than in the town, but it is not so easy. We have to visit remote villages
to collect the raw materials. So, the collecting of raw materials is very expensive. [Participant # 9]

*4.2 Foreign market*
Some of the SME owners collect their raw materials from foreign markets, as Bangladesh
does not have available raw materials for products. In addition, the quality of the local
products is not at a satisfactory level and is not certified by the International Organization for
Standardization (ISO) or other concerned bodies required by the clients and government.

Bangladesh never produces such raw materials, so it had to depend on foreign countries for raw
materials. Until 2019, I was dependent on importing all foreign raw materials. After 2019, the
Bashundhara Group of Bangladesh started producing some raw materials. But its quality is
relatively bad from abroad. They don't provide us with the food-grade certificate, so that's not food
goods as well. But some customers look for cheap products so when they look for cheap products, we
have to compete in the markets. Then we have used those materials as well but not for all the
purposes, in just some cases we use cheap products in the cheap local market. We didn't use it much.
Our raw materials are Chinese and Korean. [Participant # 2]

*4.3 Inventory buying decision*
One of the participants stated that they could not make buying decisions easily, as it takes a
large amount of money. They need to order a large number of raw materials, as they need to
import from other countries. In addition, some of the local entrepreneurs mentioned that they
also have similar problems in collecting raw materials as they sometimes need a large amount
of money (Deloof, 2003). As a result, it impacts their production and business profit.

Of course, Everything is possible if there is money, but it must be seen that the price of Chinese Raw
materials depends on the season. The Winter season is the pick time when the price of the product is
10–15% higher. The biggest problem here again seems to be that it is not possible to import a small
quantity to import a product, you have to bring several containers to get something from abroad.
[Participant # 2]

*4.4 Goods and raw materials safety*
Concerning a large number of raw materials and goods safety, this research finds mixed
opinions from the participants. Some of the participants (participants# 2; 3; 7; 8) narrated that
there are risks in storing raw materials and goods. There are some partial losses of the raw
materials or goods for a long time or seasonal investment. The ratio of partial losses is
10–15%. We also asked the participant if seasonal goods can be sold later that time and found
a negative response for selling their goods.

Definitely. If the papers cannot be manufactured over time, then they are ruined. When the
temper is damaged, the quality of the paper is damaged. Once it's hot weather, once it's winter,
the quality of the papers goes down. [Participant # 2] No. It's not possible. [Participant # 3] In
fact, we have less space to preserve. [Participant # 3] Raw materials can be damaged if stored for
a long time. Then about 10–15% loss occurs. But most of the time we don't have to face any loss.
The raw materials are stored here for a short time. We use a separate container for storage.
[Participant # 7]

Moreover, there are fewer opportunities to stock the products. Some of them (participants# 4;
10) do not have any risk in storing goods during the summer and winter seasons.

Regarding the safety of goods, we do not have much risk in winter or summer. One thing is that if rainwater falls on the goods, the goods may be damaged. [Participant # 10] I have a shop in Mirpur 2 shopping complex where I sell products. I have a two-stored shop of about 60 feet in Haji Market next to the broken river. [Participant # 4] Yes, I can because I have enough goods. [Participant # 4]

## 5. Discussion of the findings

This study found that most SME owners collect their raw materials from local sources, remote areas of the country, village entrepreneurs and local vendors. Concerning fact, John et al. (2015) outlined that SME owners draw inventory policies as per industry practice and available production capacity. Comparing the foreign market raw materials, local goods and raw materials quality is not at a satisfactory level (Beck and Demirguc-Kunt, 2006). As a result, it's an impact on cost management, product demand and performance (Hasbullah et al., 2021; Shao et al., 2021). Momany and Alshboul (2016) stated that social media has strong connectivity to brand awareness and online marketing and sales.

Sometimes, the shortage of raw materials impacts excessive cost and profit generation Hasbullah et al. (2021), Shao et al. (2021). Sometimes, they faced financial crises and liquid money in buying or managing inventories (Deloof, 2003) which also impacted on the production and business profit (Huynh, 2021).

Moreover, due to financial problems, SME owners have to bear losses due to the lack of safety management systems or procedures (Hasbullah et al., 2021; Atnafu and Balda, 2018). Therefore, it is recommended to follow or have an effective inventory management technique in SMEs that can maximize profit and enhance business operational activities (Beck and Demirguc-Kunt, 2006). Razavian et al. (2021) found that incorporating different financing sources to purchase raw materials can positively increase supply chain profitability and improve supply chain performance when disruptions happen. Long et al. (2021) found that economic policy uncertainty, capital cost and raw material cost have asymmetrical impacts on China's fixed asset investment.

## 6. Conclusion

The study concludes that SMEs in Bangladesh have to be resistant to coping with all the business challenges. This research has implications for the government, SME foundations and trade associations concerning the SME inventory management system. First, the government can make a proper system for SME businesses to buy or collect raw materials. Second, SME foundation can form a shopping mall or a separate market for SME businesses so that the owners can collect raw materials and sell the products in that particular market. The study has several recommendations to policymakers, especially to the government, SME foundation and concerned parties (banks, associations and NGOs) for the development of the SME sector and their inventory management system. The government should reduce the tax rate on importing SME raw materials and inventories and export SME products. Meanwhile, the government or "SME Foundation" should create a separate market for SME owners, which will be beneficial for businessmen to collect raw materials and sell their goods and products. The market also should have categorization according to products and services.

The study is limited within the context of Bangladesh, and the participants are located in Dhaka city. In addition, these findings could be expanded through other research with a combination of rural SME owners and managers. We collected data during the Covid situation, and it was quite tough to collect data from outside of Dhaka city. Some of the respondents are not willing to provide interviews as they have a knowledge gap in academic research. Future research can extend the research area with a combination of rural SME owners. Researchers can investigate the inventory management process of other countries. The findings could be justified through a quantitative method.

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