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# PERPETUAL AND JUST-IN-TIME INVENTORY CONTROL APPROACHES APPLIED BY MANAGERS FOR IMPROVING OPERATIONS OF SMALL AND MEDIUM SCALE ENTERPRISES

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**Abstract**

This study ascertained the extent managers applied perpetual and just-in-time inventory approaches for improving operations of small and medium scale enterprises in South-East Nigeria. Two research questions and two null hypotheses guided the study. Descriptive survey research design was adopted for the study. The population comprised 4745 registered SMEs managers from services, construction and manufacturing businesses operating within South-East Nigeria. Sample size of 1424 registered SMEs managers were used, through proportionate stratified random sampling technique. The instrument for data collection was a 22-item structured questionnaire. The instrument was validated by three experts. Cronbach Alpha was used to determine the internal consistency of the instrument, with an overall co-efficient value of 0.91. Mean and standard deviation were used to answer the research questions, while Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 alpha levels. The findings of the study revealed that just-in-time inventory approaches is lowly applied by managers of SMEs in South-East, Nigeria, while perpetual inventory approaches are moderately applied to improve their business operations. Years of business experience of managers of SMEs significantly influence their mean ratings on the extent just-in-time inventory approaches are applied for improving operations in South-East Nigeria; but did not significantly influence their mean ratings on the extent perpetual inventory approaches are applied for improving operations. It was recommended among others that Management of small and medium scale enterprises should organize regular training for managers on various inventory control approaches that will empower them to adequately apply different inventory control approaches appropriately for busines growth, sustainability, and development.

**Keywords.** Perpetual and Just-In-Time Inventory Control Approaches, Managers, SMEs.

## Introduction

Small and medium scale enterprises are generally regarded as one of the engines of economic growth in developing economies and developed nations. They have been largely acknowledged as the oil required for lubricating the engine of socio-economic transformation of any nation (Abosede, Hassan and Oko-Oza, 2017). Olaoye, Adedeji and Ayeni-Agbaj (2018) defined small and medium scale enterprises in Nigeria according to asset base and number of staff employed. Small and medium scale enterprises, according to the Olaoye, Adedeji and Ayeni-Agbaj, are enterprises with asset base between #5million to #500 million and a staff strength that is between 11 and 100. In the context of this study, small and medium scale enterprises is any enterprises that has an asset between 5 million naira to 500 million naira and a staff strength that is between 12 to 250.


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Small and medium scale enterprises account for a greater percentage of all businesses in virtually all economies and generate majority of private sector employment and output. They contribute to improved standard of living, substantial local capital formation, achieve high levels of productivity, and capability for individuals and nations. Small and medium scale enterprises play very important roles in the process of employment creation, industrialization, provision of personalised services and sustainable economic growth (Mohammed, Balaraba and Salawak, 2017).

Despite the positive outlook and growth trends of the sector, small and medium scale enterprises in Nigeria, as in most developing economies, are faced with a number of challenges. These challenges include inadequate capital (finance), poor record keeping, unsuitable location, poor planning, inadequate infrastructural facilities, lack of skilled manpower, inadequate managerial and entrepreneurial skills, corruption and lack of transparency arising from government regulation and regulators (Imoisi and Ephraim, 2015). Others include break downs in production schedule, supply shortages, reduction of working capital as a result of excess procurement of raw materials and low capacity utilization which constitute a problem to their effective growth and development among others (Alabi, Awe and Musa, 2015; Mohammed, Balarabe and Salwa, 2017). Among these, finance is a core problem area for Nigeria's SMEs (Eze and Uchenu, 2021). Another challenge lays in the applied of inventory control approaches. Effective management of inventories control can increase the profit of a business and as well add to its return on total asset.

Inventory control approach refer to the various systems and means used in an enterprise to control the enterprises investment in stock which deal with recording and monitoring of stocks levels, forecasting future demands, deciding when and how many to be order. Nikita, Siphokazi, Sphelele, Siyanda, Mamorena and Juan-Pierré (2015) noted that a good inventory control approach offers a wide range of benefits to business organizations as the proper relationship between sales and inventory can better be well maintained. First, without inventory control approaches in place, the stores department can become over-stocked or under-stocked. Similarly, inventory control approaches provide a business with information needed to take markdowns by identifying slow-selling merchandise. Discovering such items early in the season will allow a business to reduce prices or make changes in marketing strategy before consumer demands completely disappear.

Marfo-Yiadom, Asante and Darkwah (2018) held that holding large quantity of inventory offers wide range of benefits to organizations and can as well be associated with certain costs. Marfo-Yiadom et-al noted among other things that, holding large inventory helps to ensure that the possibility of disruption to production from a stock-out is remote. Large stocks mean that large orders can be placed so that buyers can negotiate favourable prices and thus get trade discounts. Large stocks protect the firms against price increases for a few months as large stocks mean fewer and less frequent orders, which will cut the cost of buying inventory. Inventory control approach basically deals with two problems: When should an order be placed? (Order Level), and How much should be ordered? (Order Quantity). These questions are answered by the use of inventory models.

Inventory model is a mathematical/scientific model that helps businesses in determining the optimum level of inventories that should be maintained in a production process, managing frequency of ordering, deciding on quantity of goods or raw materials to be stored, tracking flow of supply of raw materials and goods to provide uninterrupted service to customers without any delay in delivery. The scientific model strikes the balance between the loss due to non-availability of an item and cost of carrying the stock of an item. Scientific model aims at maintaining optimum level of stock of goods required by the company at minimum cost to the company. Olowolaju (2015) revealed some benefits of inventory control approach through the practice of scientific inventory control to include


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improvement in customer's relationship because of the timely delivery of goods and services, smooth and uninterrupted production resulting in no stock out; efficient utilization of working capital and minimizing loss due to deterioration, obsolescence, damage and pilferage, economy in purchasing, and eliminates the possibility of duplicate ordering.

Consequently, suitable inventory control approaches that meet the economic reality of a particular business organization must be applied. A number of systems and approaches have been developed in the field of operations control to deal with inventory problems. Such inventory control approaches include Economic Order Quantity (EOQ), Activity-Based Costing (ABC), Just In Time (JIT), Vendor Managed Inventory (VMI), Perpetual Inventory Control, Periodic Inventory, Barcode Inventory Control. Others are Two Bin Method, Three Bin Method, Fixed Order Quantity, Fixed Period Ordering, Frequency Identification (RFID), Vital Essential Desirable, Fast Normal Slow Deed, Fixed Order Quantity and Fixed Period Ordering (Kumar and Anas, 2015). This study focused on perpetual and just-in-time inventory control approaches in SMEs.

Perpetual inventory maintains a continuous record of physical quantities of inventory. It records the purchase of each item of inventory. Perpetual inventory allows for more real-time inventory tracking, making it superior to other methods. However, the system requires consistent record-keeping and monitoring. This system is essential for adequate management planning and controls over inventory maintained and stock out (Yitayew, 2014). Perpetual inventory control approach continually updates inventory records and accounts for additions and subtractions when inventory items are received, sold from stock, moved from one location to another, picked from inventory and scrapped. It controls the movement of each item of inventory as it goes in and out of stock and shows the current balance at hand. According to Wangari and Kagiri (2015), some organizations prefer perpetual inventory approach because they deliver up-to-date inventory information and better handle minimal physical inventory counts. Perpetual inventory control approach is also preferred for tracking inventory because they deliver accurate results on a continual basis when managed properly. To Chopra (2015), this type of inventory control system works best when used in conjunction with a database of inventory quantities and bin locations up-dated in real time by warehouse workers using barcode scanners. Perpetual inventory system is preferred in organizations due to the fact that it delivers inventory information that are not outdated thus handle minimal physical inventory counts.

In addition, Otchere, Adzimah and Aikens (2016) found that perpetual inventory management is relatively good and the organization checks inventory continuously and at fixed time intervals (monthly) to keep their stock always available to meet customer demands. Mbanugo and Uzoka (2021) noted that the perpetual inventory management practice was lowly applied by stores officers in public tertiary educational institutions. In support, Shava and Runjani (2016) stated that the performance of small and medium scale enterprises is strongly linked to prior business experience of the managers. While, Zbigniew and Bieniasz (2016) revealed that general in 2005-2010 the perpetual inventory cycles were significantly reduced, which points to higher effectiveness of management of those assets. Many problems associated with perpetual inventory control approach is that the approach cannot be maintained manually and require specialized equipment and software that results in a higher cost of implementation, especially for businesses with multiple locations or warehouses. Another challenge of using a perpetual inventory control approach is that recorded inventory may not reflect actual inventory as time goes by because they do not use regular inventory approach (that is, when physical inventory counts are being completed, normal business activities nearly become


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suspended). As a result, workers may hurry through their physical counts because of time constraints. Thus, this brings the need for just-in-time inventory approaches.

Just-in-time inventory (JIT) control approaches are the modern concept in inventory management aimed at reducing inventory costs. With just-in-time inventory control approach, the exact amounts of good items arrive at the moment they are needed. Just-in-time control approach is a common inventory control and type of learning methodology designed to increase efficiency, cut cost and decrease waste by receiving goods only as they are needed. Olowolaju (2015) defined just in time control approach as a manufacturing system whose goal is to optimize processes by continuously pursuing waste reduction. Yazan (2017) stated that production and operations research has shown that JIT purchasing can potentially have benefits to the firms in the form of increasing product quality, improving supplier/buyer relationships and increasing sales. Akintoye (2014) stressed that the closeness of a company to the ideal JIT situation depends on the type of production process and the nature of supplier industries. The idea of JIT is to drive all queues toward zero in order to minimize inventory investment, shorten production lead time, react faster to demand changes and uncover any quality problem. In just-in-time inventory control approach, the organization keeps only as much inventory as it needs during the production process. With no excess inventory in hand, the company saves the cost of storage and insurance.

More so, Musara (2016) revealed that, on average, small and medium scale enterprises agree that lack of reliable supplier networks, lack of capital, lack of knowledge of financial gains and lack of capacity are the major challenges impeding their application of JIT principles. Yazan (2017) stated that production and operations research has shown that JIT purchasing can potentially benefits firms in the form of increasing product quality, improving supplier/buyer relationships and increasing sales. Musara stated that there is significant positive correlation between the use of JIT principles and cost efficiency, quality improvements and flexibility by managers' years of business experience. In addition, Agu, Obi-Aike and Eke (2016) added that just-in-time inventory approaches as a significant effect on the growth of the manufacturing firms to prior business experience of the managers. Therefore, all the inventory control approaches mentioned above can be seen as the system/procedures and controls that managers could use to create and improve operations of small and medium scale enterprises.

Managers are people or individuals who managed SMEs for another person or own in the business organization. To Onwuchekwa, Emele and Onwuchekwa (2017), small and medium scale enterprises managers are those who undertake innovation, finance, control and apply their business acumen in an effort to transfer innovation/inventory into goods. Small and medium scale enterprises managers are individuals heavily involved in the day-to-day running of the enterprises. Notably, Mohammed, Balaraba and Salawak (2017) defined managers of small and medium scale enterprises as business agents who play a major role in realizing the commercial and marketing objectives of the enterprises. This implies that managers of SMEs are also an entrepreneur who owns a business who could also be managers of enterprises saddled with the responsibilities of managing the day-to-day affairs of an enterprise. In the context of this study, managers of small and medium scale enterprises are owners who invest their capital to create value and get appropriate returns on their investment, and also serve as the accountants.

Certain variables may have an influence on the opinion of managers regarding the extent they applied inventory control approaches such as years of business experience. Years of business experience in this study means the number of years managers have spent in the operation of small and medium scale enterprises. Extant literature from established economies shows that performance of


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small and medium scale enterprises is strongly linked to prior business experience of the managers (Shava and Runjani, 2016). Thus, it could be said that the older the managers in business, the more they are equipped to apply adequate inventory control approaches that suits their business. In the context of this study, years of business experience consists of number of years (1 to 5years, 6 to 10years and above 10years) the managers spent within organizations and are involved in effective inventory control approaches.

According to Choi (2015) effective inventory control approach is essential in the operation of any small and medium scale enterprises. Naliaka and Namusonge (2015) noted that efficient control of inventory enhances competitive advantage of small and medium scale enterprises and sustains their operations. But the inability of managers of SMEs to apply inventory control approach will result to overstocking which eventually got expired or out- dated; under stocking, lack of stock-taking, theft of materials by workers and delays in deliveries of materials among others. Ugwu and Nwakoby (2020) indicated that many SMEs are not applying inventory control approach satisfactorily, usually due to the reality that most managers are unsound, ineffective and unwell-coordinated. Notably, the growth and development of small and medium scale enterprises in South-East seem to be slow and, in some cases, even stunted, due to poor or inappropriate inventory control approaches applied in the operations by some managers. Thus, a lot have been said, written about the inventory control approaches by managers of small and medium scale enterprises in the world over. It has also formed the subject of discussion in so many seminars and workshops both locally and internationally.

In the same vein, government at various levels have in one way or the other focused on small and medium scale enterprises. While some governments had formulated policies aimed at facilitating and empowering the growth, development and performance of small and medium scale enterprises through soft loans and other fiscal incentives, none of these efforts towards improving the performance of small and medium scale enterprises was directed towards their inventory control approaches. Despite all effort make by government towards growth, development and performance of small and medium scale enterprises. In recent time, a number of firms in South-East faced numerous challenges especially in inventory control, which affected their performances. It is on the basis of this background that this study was conceived to ascertain the extent managers applied inventory control approaches for improving operations of small and medium scale enterprises in South-East, Nigeria so as to ensure their continuous existence.

**Statement of the Problem**

Inventory control is critically important to all organizations (SMEs) inclusive. Materials flow has to be maintained if output and distribution are to be maintained. The most common problem in inventory control in most small and medium scale enterprises includes under stocking, over stocking costs, frequent stock-outs, low rate of inventory turnover, high working capital, high cost of storage, high cost of inventory with its negative effect on profits and continuity of businesses. This results in improper valuation of stock and maintaining of accurate data on a continual basis to attain optimal inventory levels which affects (SMEs) financial reporting. This makes the study on perpetual and just-in-time inventory control approaches applied by managers in SMEs for improving operations of small and medium scale enterprises in South-East Nigeria.


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**Purpose of the Study**

The main purpose of this study was to ascertain the extent perpetual and just-in-time inventory control approaches are applied by managers in SMEs for improving operations of small and medium scale enterprises in South-East Nigeria. Specifically, the study sought to ascertain the extent:

1. perpetual inventory approaches are applied by managers for improving operations of small and medium scale enterprises in South-East Nigeria.
2. just-in-time inventory approaches are applied by managers for improving operations of small and medium scale enterprises in South-East Nigeria.

**Research Questions**

The following research questions guided this study:

1. To what extent do perpetual inventory approaches apply by managers for improving operations of small and medium scale enterprises in South-East Nigeria.
2. To what extent do just-in-time inventory approaches apply by managers for improving operations of small and medium scale enterprises in South-East Nigeria.

**Hypotheses**

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of the respondents on the extent they apply perpetual inventory approaches for improving operations in South-East Nigeria based on their years of business experience based on experience (1-5 years, 6-10 years and above 10 years).
2. There is no significant difference in the mean ratings of the respondents on the extent they apply just-in-time inventory approaches for improving operations in South-East Nigeria based on their years of business experience based on experience (1-5 years, 6-10 years and above 10 years).

**Method**

The study adopted descriptive survey design. The population of the study comprised 4745 registered SMEs managers from services, construction and manufacturing businesses operating within South-East Nigeria. A sample size of 1424 registered SMEs managers were used for the study. The sample size was derived using proportionate stratified random sampling technique. Data for this study was collected using a 19 items structured questionnaire. The respondents were requested to rate the items on a 5-point rating scale of Very Highly Applied (VHA), Highly Applied (HA), Moderately Applied (MA), Lowly Applied (LA) and Very Lowly Applied (VLA) with values 5, 4, 3, 2 and 1 respectively. The instrument was validated by two experts in business education.

Cronbach's alpha method was used to establish the reliability of the instrument. The reliability coefficients values of 0.88 and 0.93 for clusters B1 and B2 respectively with an overall coefficient value of 0.91. Out of the 1424 copies of the questionnaire distributed to the respondents in their organizations through direct approach which facilitated a response rate, 1414 copies (representing 99 percent) were dully completed, retrieved and used for data analysis. Data collected were analyzed using mean and standard deviation to answer research questions while ANOVA was used to test the null hypotheses at 0.05 level of significance. The application of Statistical Package for Social Sciences (SPSS) version 23 was used for data analysis. For the hypotheses, p-value was used for decision making. Where the calculated p-value was less than the stipulated level of significance


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0.05 ($p < 0.05$), it implies that there was a significant difference between respondents' mean scores and the null hypothesis is rejected. On the other hand, if the p-value is greater than or equal to the alpha level of 0.05 ($p \geq 0.05$), it means that there was no significant difference in the respondents mean scores and is not rejected.

**Results**

***Research Question 1.*** To what extent do managers applied perpetual inventory approaches for improving operation of small and medium scale enterprises in South-East Nigeria?

**Table 1.**

Mean ratings of Managers on the extent they applied perpetual inventory approaches for improving operation of small and medium scale enterprises

| SN | Perpetual Inventory Approaches | Mean | SD | Remarks |
|---|---|---|---|---|
| 1 | Keeping a continuous track of inventory balances | 3.60 | 0.43 | Moderately Applied |
| 2 | Speeding up their financial and accounting matters | 3.20 | 0.64 | Moderately Applied |
| 3 | Creating more accurate tax and regulatory reports | 3.70 | 0.42 | Moderately Applied |
| 4 | Delivering up-to-date inventory information and better handle minimal physical inventory counts | 2.49 | 0.68 | Lowly Applied |
| 5 | Avoiding over-stocking as well as stock-outs to maintain customers patronage | 3.54 | 0.48 | Moderately Applied |
| 6 | Saving inventory and storage costs | 3.24 | 0.56 | Moderately Applied |
| 7 | Quickly identifying any discrepancies due to theft or shrinkage | 2.20 | 0.78 | Lowly Applied |
| 8 | Using technology software for real-time inventory tracking | 3.50 | 0.50 | Moderately Applied |
| 9 | Having a better understanding of consumer preferences to ensure satisfaction of their needs | 3.36 | 0.54 | Moderately Applied |
| 10 | Eliminating guesswork when it comes to setting replenishment levels | 3.56 | 0.46 | Moderately Applied |
| | Clustered mean | 3.24 | | Moderately Applied |

Data in Table 1 shows the cluster mean score of 3.24 indicating that Managers of SMEs in South-East, Nigeria moderately applied perpetual inventory approaches in their business operations. The analysis of the items further indicates that Managers rated eight items out of the ten listed items as moderately applied. The mean rating for the eight items ranged from 2.50 to 2.70. The remaining two items were rated by managers as lowly applied with mean ratings ranging from 2.20 to 2.49. The standard deviation of 0.42 to 0.79 showed that respondents are not wide apart in their mean ratings which indicate homogeneity.

***Research Question 2.*** To what extent do managers applied just-in-time inventory approaches for improving operation of small and medium scale enterprises in South-East Nigeria?

**Table 2.**

Mean ratings of Managers on the extent they applied just-in-time inventory approaches for improving operation of small and medium scale enterprises


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| SN | Perpetual Inventory Approaches | Mean | SD | Remarks |
|---|---|---|---|---|
| 1 | Producing right items at the right time | 2.60 | 0.47 | Moderately Applied |
| 2 | Making available right quantity of items at the right time | 2.20 | 0.74 | Lowly Applied |
| 3 | Providing right quality of goods at right place at the right time | 2.73 | 0.44 | Moderately Applied |
| 4 | Managing material in-flow in a plant in order to reduce the levels of inventory | 2.59 | 0.50 | Moderately Applied |
| 5 | Planning and programmed activities to avoid over production | 2.52 | 0.53 | Moderately Applied |
| 6 | Improve return on investment of a business by reducing inventory and its associated carrying costs | 2.35 | 0.48 | Lowly Applied |
| 7 | Creating items that arrive when needed | 2.33 | 0.72 | Lowly Applied |
| 8 | Having quick information of the consumption of old stock, that triggers new stock to be ordered | 2.36 | 0.58 | Lowly Applied |
| 9 | Saving warehouse space and costs by reducing inventory | 2.24 | 0.71 | Lowly Applied |
| | Clustered mean | 2.44 | | Lowly Applied |

Data in Table 2 shows the cluster mean score of 2.44 indicating that managers of SMEs in South-East, Nigeria lowly applied just-in-time inventory approaches in their business operations. The analysis of the items further indicates that managers rated four items out of the nine listed items as moderately applied. The mean rating for the eight items ranged from 2.52 to 2.73. The remaining five items were rated by managers as lowly applied with mean ratings ranging from 2.20 to 2.36. The standard deviation of 0.44 to 0.74 showed that respondents are not wide apart in their mean ratings which indicate homogeneity.

***Hypothesis 1.*** Managers SMEs do not differ significantly in their mean ratings on the extent they applied perpetual inventory approaches for improving operations in South-East Nigeria based on their years of business experience.

**Table 3.**
Summary of ANOVA on managers' ratings on the extent perpetual inventory approaches are applied for improving operations based on their years of business experience.

| Sources of Variance | SS | df | MS | F | p-value | Decision |
|---|---|---|---|---|---|---|
| Between Groups | 1.213 | 2 | 1.223 | 11.68 | 0.441 | Not Significant |
| Within Group | 1.723 | 141 | 1.131 | | | |
| Total | 2.936 | 143 | | | | |

Table 3 shows that there is no significant difference among the three groups (1-5 years, 6-10 years and above 10 years) in terms of their mean ratings on the extent they applied perpetual inventory approaches for improving operations in South-East Nigeria based on their years of business experience. It was observed that at 0.05 level of significance, 2 is nominator and 1411 of denominator,


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the calculated F-ratio is 11.168 and *P-value* 0.441 which is greater than the 0.05 alpha level. Therefore, the null hypothesis is not rejected.

***Hypothesis 2.*** Managers of SMEs do not differ significantly in their mean ratings on the extent they applied just-in-time inventory approaches for improving operations in South-East Nigeria based on their years of business experience.

**Table 4.**
Summary of ANOVA on managers' ratings on the extent just-in-time inventory approaches are applied for improving operations based on their years of experience.

| Sources of Variance | SS | df | MS | F | p-value | Decision |
|---|---|---|---|---|---|---|
| Between Groups | 1.526 | 2 | 1.763 | 34.574 | 0.000 | Significant |
| Within Group | 4.055 | 1411 | 1.022 | | | |
| Total | 5.581 | 1413 | | | | |

Table 4 shows that there is a significant difference among the three groups (1-5 years, 5-10 years and above 10 years) in terms of their mean ratings on the extent they applied just-in-time inventory approaches for improving operations in South-East Nigeria based on their years of business experience. It was observed that at 0.05 level of significance, 2 is nominator and 1411 of denominator, the calculated F-ratio is 34.574 and *P-value* .000 which is less than the 0.05 alpha level. Therefore, the null hypothesis is rejected.

**Discussion of Findings**

Findings of the study revealed that perpetual inventory approaches are moderately applied by managers of small and medium scale enterprises for improving operation in South-East Nigeria. This implies that managers of SMEs in South-East have not fully applied perpetual inventory approaches in updating records promptly, making sure that additions to records are referenced to supporting invoices for easy verification of the records and tracking the real time movement of materials and equipment. The application of perpetual inventory approaches in financial reporting activities of SMEs by managers will help in maintaining inventory at suitable levels and at the lowest possible cost to ensure uninterrupted supplies. This finding is in line with Wangari and Kagiri (2015) that some organizations prefer perpetual inventory approach because they deliver up-to-date inventory information and better handle minimal physical inventory counts. In line with this, Otchere, Adzimah and Aikens (2016) found that perpetual inventory management is relatively good and the organization checks inventory continuously and at fixed time intervals (monthly) to keep their stock always available to meet customer demands. The finding disagrees with Mbanugo and Uzoka (2021) that the perpetual inventory management practice was lowly applied by stores officers in public tertiary educational institutions.

The findings of the study further revealed that there is no significant difference in managers' mean ratings on the extent they applied perpetual inventory approaches for improving operation of small and medium scale enterprises in South-East Nigeria based on their years of business experience. These findings agree with Shava and Runjani (2016) stated that the performance of small and medium scale enterprises is strongly linked to prior business experience of the managers. The finding of this study disagrees with Zbigniew and Bieniasz (2016) who revealed that general in 2005-2010 the


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perpetual inventory cycles were significantly reduced, which points to higher effectiveness of management of those assets.

The reason for the similarities in test of hypotheses is because most of the SMEs managers control the movement of each item of inventory as it goes in and out of stock and shows the current balance at hand. The reason for determining extent managers applied perpetual inventory approaches are they preferred using it for tracking inventory because they deliver accurate results on a continual basis when managed properly. This difference in mean ratings could be as a result of hurry in their physical counts because of time constraints.

Findings of the study revealed that just-in-time inventory approaches are lowly applied by managers of small and medium scale enterprises for improving operation in South-East Nigeria. This signifies a low level on application of just-in-time activity-based which is unremarkable. This indicate that managers of SMEs in South-East do not give adequate attention regarding improvement of their business return on investment by reducing in-process inventory and associated carrying costs. This finding is in line with Musara (2012) who revealed that, on average, small and medium scale enterprises agree that lack of reliable supplier networks, lack of capital, lack of knowledge of financial gains and lack of capacity are the major challenges impeding their application of JIT principles. The findings disagreed with Yazan (2017) which stated that production and operations research has shown that JIT purchasing can potentially benefits firms in the form of increasing product quality, improving supplier/buyer relationships and increasing sales.

The findings of the study further revealed a significant difference in managers' mean ratings on the extent they applied just-in-time inventory approaches for improving operation of small and medium scale enterprises in South-East Nigeria based on gender and their years of business experience. These findings agree with Musara (2016) that there is significant positive correlation between the use of JIT principles and cost efficiency, quality improvements and flexibility by managers' years of business experience. In addition, Agu, Obi-Aike and Eke (2016) who added that just-in-time inventory approaches as a significant effect on the growth of the manufacturing firms to prior business experience of the managers.

The reason for the similarities in test of hypotheses is because most of the SMEs managers focused on pull production concept which reduces the overall inventories in their warehouses. The reason for determining extent managers applied economic order quantity (EOQ) inventory approaches is because they are one who should employ inventory classification techniques to improve their business operations. This difference in mean ratings could be as a result of increased in transportation costs and purchasing costs of products by small and medium scale enterprises, and among others.

**Conclusion**

Based on the findings of this study, it was concluded that perpetual and just-in-time inventory approaches have not been fully applied by managers for improving operations of small and medium scale enterprises in South-East Nigeria. The application of perpetual and just-in-time inventory control approaches by managers in the operation of small and medium scale enterprises will help to ensure efficiency in the output of the SMEs. Thus, the perpetual and just-in-time inventory control approaches mentioned here were not widely applied which is as a result of SMEs managers' inability to determine the roles inventory control plays in the activities of organizations, and due to the reality that most managers are unsound, ineffective and unwell-coordinated in their job.


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**Recommendations**

Based on the findings of this study, the following recommendations are made:

1. Management of small and medium scale enterprises should organize regular training for managers on various inventory control approaches that will empower them to adequately apply different inventory control approaches appropriately for growth, sustainability, development and smooth running of their businesses.
2. Government should offer short course on inventory management techniques to owners of small and medium scale enterprises. This will acquaint them with the rudiments and inventory control approaches for effective inventory control in their enterprises.

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