Evaluate the effect of perpetual inventory management control practice on performance of selected polytechnics in Southwest, Nigeria

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Abstract
The choice of which inventory system or practice could better suit an organization was a matter of relevance or usefulness of the inventory practices to be adopted. Therefore, a good inventory system must as a matter of necessity be able to capture accurately information need of the organization, be users friendly and be relevant in term of consistency which were the hallmark of perpetual inventory system. This study examined the effect of perpetual inventory management control practice (on the basis of indicators regular updating of inventory, delivery of up to date information, accurate capturing of inventory, increase information technology skills application and ensue different in real inventory taking) on performance of selected polytechnics in Southwest, Nigeria. To investigate the objective, a survey research design was adopted to gather data for the study through the distribution of questionnaire to 736 respondents in the selected polytechnics. More so, from the 736 copies of questionnaire distributed to the respondents' only lt 720 copies of questionnaire were counted as valid and useful for the study. The descriptive statistics and inferential statistics of Ordinary Least Square (OLS) were employed for the study. The finding of the study indicated that perpetual inventory control system had a significant positive effect on performance of the polytechnics. The study concluded that perpetual inventory control system enhanced the inventory performance of the polytechnics.
Keywords*: PICS, Regular Updating, Information Technology, Real Inventory, Organizational Performance*

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I.   Introduction

The declining performance and rising magnitude of inefficiency among store employees in Nigerian polytechnics is the first thing that triggered this study. Statistical facts, such as Nigeria's Human Capital Index, could be used to illustrate the low or declining performance of the Civil Service. For instance, the poverty rate in Nigeria rose in the past three decades. It rose from 27.2% in 1990 to 46.3% in 2000, and in 2002, it dropped to 42.7%. By 2016, the poverty rate in Nigeria had risen to 65.6% (National Bureau of Statistics, 2022). By and large, the above stated statistical facts are indicative of the poor social conditions in Nigeria, which are some of the consequences of the faulty and/or non-implementation of policies, and the poor monitoring and evaluation of government policies and programmes - as a result of public sector corruption, inadequate material resources, lack of policy continuity (Makinde, 2022), lack of technical know-how, bureaucratic corruption, and the poor performance of public employees. Onyeacholem (2022) argues that the main reason for the high rate of non-implementation or poor implementation of policies, programmes and projects (that are meant to enhance Nigeria's Human Capital Index, Gross Domestic Product, and Physical Infrastructure Development) is the Nigerian civil servants' poor attitude to work.

The educational institutions, especially the polytechnics, contribute significantly to the economy in several ways such as training of technical manpower, middle level management employees as well as providing employment opportunities for both academic and non-teaching staff. The education sector in Nigeria contributes significantly to the gross domestic product of the country (National Bureau of Statistics, 2022). The contributions of the education sector are germane to the economy and more than double of the manufacturing sector, especially in the area of technological change in the economy. More so, higher education stimulates research and hereby raises productivity which undoubtedly benefit the society. Regrettably, this subsector of the industry is facing both financial and non-financial problems due to poor inventory management practices. Some studies showed that a large number of enterprises fail because of incompetent staff put in charge of inventory management (Liedholm, MacPherson & Chuta 2020). The study by Tushabomwe (2022) revealed that poor record keeping and lack of basic inventory management experience and skills by staff of most central stores are major contributors to failure.

Hence, it is imperative to empirically investigate the view of Tushabomwe (2020) in the context of some selected polytechnics in Southwest Nigeria.

Public enterprises have become less competitive due to poor inventory control systems. Countless public establishments have adopted inventory management systems in their efforts to achieve performance targets as well as to improve their operational efficiency. However, it appears less emphasis is placed on inventory management in public institutions due to the notion that public enterprise is no man's enterprise. The consequences of this seem to have lowered the bar of organization performance such as polytechnics as a sub-sector of the economy (NBTE, 2022).

Despite the importance of inventory management system in public tertiary institutions, it appears many polytechnics in the Southwest do not give the phenomenon the attention it desires and this seems to be responsible for mismanagement of tax payers' resources and lack of competence among store staff, leading to inefficiency and inadequate performances.

The study laments that the treatment of files in Nigerian public sector organizations which ideally should not take more than 48 hours, most often take as long as four weeks. He also posits that records are so poorly kept, and therefore take awful length of time to retrieve. More worrisome, according to Onyeacholem (2022), is the fact that approvals for useful projects which ought not to take more than one week seem to take almost eternity. The consequence is the poor state of the nation's economy. The spirit of public service appears to have overwhelmed store staff across polytechnics in South-west Nigeria as inventory are not properly maintained.

Majority of studies like, (Atnafu & Balda, 2018; Otuya & Eginiwin, 2019) have adopted qualitative approach and have not obtained deep insights of how inventory management systems contribute to organizational performance and yet polytechnics have intensive capital in inventories whose management is vital to the sustainability of the Nigerian education system. If nothing urgent is done to address this challenge, the already lean resources of the government could further rendered unproductive. For instance, some establishments prefer perpetual inventory control systems because they deliver up-to-date inventory information and better hold negligible manual inventory counts. The application of this method of inventory management appears beneficial to tertiary institution but little attention has been made to unveil the associated consequences of the system.

Hence, this study was undertaken to fill this gap by investigating the effects of inventory management practices on performance of selected polytechnics in Southwest, Nigeria. Furtherance to the above and to the knowledge of the researcher, inventory-related aspects of management in educational institutions have not yet attracted the full attention of researchers and policy makers in Nigeria. In view of the above, this study examined the effects of perpetual inventory management practices on performance of selected polytechnics in Southwest, Nigeria. On the basis of the foregoing, the paper intends to test the hypothesis stated as;

H_O: Perpetual inventory control practice has no significant effect on performance of selected polytechnics in Southwest, Nigeria**.**

II. Literature Review

This section of the study focuses on the review of literature under the following sub-section, conceptual, theoretical framework and empirical review of literature.

Conceptual Review
Meaning and Definition of Inventory Management

Vessils (2020), posits that inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials(working-in-progress) and finished good so that adequate supplies are available and the costs of over or under stocks are low. Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. Inventory management has to do with art and science of maintaining stock levels of a given group of items incurring the least cost consistent with other relevant targets and objectives set by management (Lwiki, Ojera, Mugenda & Wachira, 2018).

Naliaka and Namusonge (2020) defined inventory management as a fine line between the replenishment lead time, carrying costs, asset management, inventory forecasting, valuation of inventory, future inventory price forecasting, physical inventory, inventory visibility, available space for inventory, quality management, replenishment, returns, defective goods and demand forecasting. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting. Balancing these competing requirements leads to optimal inventory levels, which is an on-going process as the business needs shift and react to the wider environment (Timothy, 2022).

To this end, this paper adopts Vessils (2020) definition of inventory management which explains inventory management as all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials(working-in-progress) and finished good so that adequate supplies are available and the costs of over or understocks are low. Employees at the various departmental stores in Nigeria's polytechnics perform such tasks as managing the inventory level of materials and ensuring that adequate supplies are available to meet the various needs of units and departments in the polytechnics.

Concept of Inventory Management Practice

Inventory management practices involve the use of many techniques of managing inventories in an organization, these techniques are Economic Order Quantity (EOQ) method, Stock levels, ABC analysis, Strategic Supplier Partnership, Electronic Data Interchange (EDI), Just- In- Time, bar coding and Lean inventory system. All these methods can be used by any organization in managing inventories (Tungo, 2019). In this study, emphasis of the researcher is on inventory management practices proxies used in this study which is perpetual inventory but other forms of inventory management practices may also be discussed in the next sub-section.

Perpetual Inventory Control Systems

The perpetual inventory control system is concerned with regular updating inventory records and accounts at any time when inventory items are collected, traded from inventory, transported as of one area to alternative, retrieved from inventory, and discarded (Enikanselu 2018). The author further points out that, some establishments prefer perpetual inventory control systems because they deliver up-to-date inventory information and better hold negligible manual inventory counts. They are also chosen because they are considered fast an accurate in capturing inventory on continual basis when they are they are properly utilized and managed (EniKanselu, 2018). For the matter of emphasis, Chopra (2020) adds that perpetual inventory control performs better when used together with a database of inventory amounts by storeroom staffs using barcode scanners In spite of the importance, they have for the better performance of the organization, perpetual inventory control systems have some shortcomings. First, these systems are technologically dependent as it is impossible to maintain them manually. Instead, they require technical equipment and software, which results in a large rate of execution, particularly for businesses with a great number of locations or warehouses. In addition, they need necessary periodic maintenance and upgrades, which also add extra cost.

Second, because they do not employ a consistent inventory system, a perpetual inventory system may cause recorded inventory to differ from real inventory over time. Third, since so much time occurs between physical inventory counts, they make it problematic to discover where inconsistencies in inventory amounts arise when employing a periodic inventory management system (Enikanselu, 2018). As a result, inaccuracies, stolen products, and inadequately scanned objects have an impact on the inventory that is recorded thereby creating an expected deviation from the actual inventory counts..

Just-In Time (JIT) Inventory

According to Mazanai (2022), JIT is an inventory technique used to improve a commercial enterprise's return on investment by reducing inventory and its associated wearing fees, as well as enhancing performance and, as a result, saving inventory management costs and lead time expenses. In an endeavor to obtain JIT, Bicheno (2022) argues that the process has to have indicators of what is going on everywhere inside the entire inventory system. JIT is said to result in significant improvements in a manufacturing company's return on the investment and optimum performance. It underlines the importance of manufacturing in the creation of devices that is, useful tools or devices that arrive when needed, neither in earlier time nor later time but on time (Bicheno, 2022), MuchaedepiMone and Mbugi (2019) and Chase (2019), cited in Adeyemi and Salami (2020). Furthermore, a just-in-time inventory system keeps stock levels low by only producing for particular customer requests. The outcome is a significant reduction in stock investment and scrap expenditures, despite the fact that, as the above-mentioned authors suggest, an excessive degree of coordination is required. Farzaneh (2022) argued that JIT can eliminate garage, investment, insurance, ordering, and shipping costs. However, it is contingent on the current circumstances. In the ideal circumstance, when all of the parameters are met, it is more cost-effective to choose JIT over EOQ since it results in a simultaneous reduction in purchase price, protection charge, and ordering fee, as the author recommended

Vendor Managed Inventory

Vendor Managed Inventory (VMI) is a supply chain method whereby the vendor or supplier is given the duty of managing the purchaser's inventory (Smaros *et al.*, 2023). The vendor is given access to its purchaser's inventory and demand statistics for reasons of tracking the customer's stock level. Moreover, the vendor has the

authority and the obligation to replenish the purchaser's inventory according to collectively agreed inventory control concepts and targets (Smaros *et al*., 2023)

Meaning and Definition of Organizational Performance

Organizational Performance incorporates the resulting outcomes of the performed actions of employees based on their expertise and skills. In organizational settings, employees' performance is the accumulated result of the skills, efforts and abilities of all the employees contributed in organizational improved productivity leading towards its goal achievement. Improved organizational performance indicates the efforts towards goal achievement while requiring more efforts in terms of improved employee performance (Ellinger *et al*, 2023). Employee performance is among the critical factors that contribute significantly in organizational success. Learning organizations play important role in enhancing employee performance through providing trainings and developments for their employees (Gitongu *et al*, 2020). Moreover, management standards to evaluate employee performance also play critical role in improving employee performance as they provide the picture of actual performance and its alignment with the benchmarks. Researchers have defined employee performance as well as highlighted parameters affecting employee performance as in the following. Anitha (2018) reports that the performance of an individual or an organization depends strongly on all organizational activities, policies, practices, knowledge management practices and employee engagement. These elements are vital determinants fostering high levels of employee performance.

Islami, Mulolli and Mustafa (2018) on their part recognize managing performance as a planned process of which the key elements are agreement, measurement, support, feedback and positive reinforcement, which shaped outcomes in terms of performance expectation. Also, Bataineh (2017) highlight Employee's performance as a combination of efficiency and effectiveness of the employee's daily tasks to meet the expectations of the stakeholders. Isaac, Abdullah, Ramayah and Mutahar (2017) show that employees highly agree that implementing the internet in their job helped them in improving task process, education acquisition and the quality of their communication which lead to improving individual performance as well as organization.

According to Hermina and Yosepha (2019), the word performance was coined from the word job performance or actual performance which indicates the work performance or actual achievement by someone. The authors stated that performance or work performance is the work quality and quantity achieved by an employee in carrying out his function in accordance with the responsibilities given to him.

Performance in the view of Al Mehrzi and Singh (2020) is the result or level of success of a person as a whole during a certain period in carrying out tasks compared to various possibilities, such as work standards, targets or targets or predetermined criteria that have been mutually agreed upon. Furthermore, Yang, Lee and Cheng, (2020) stated that performance is basically what employees do or do not do.

Dimensions of Employees Performance

In this study employee performance will be measured in terms of task performance, adaptive performance and contextual performance.

Task Performance: Task performance according to Pradhan and Jena (2020) comprises of job explicit behaviors which includes fundamental job responsibilities assigned as a part of job description. Task performance requires more cognitive ability and is primarily facilitated through task knowledge, task skill and task habits. Task knowledge is a requisite technical knowledge or principles to ensure job performance and having an ability to handle multiple assignments. Task skill is the applications of technical knowledge to accomplish task successfully without much supervision, while task habits is an innate ability to respond to assigned jobs that either facilitate or impede the performance (Conway in Pradhan & Jena, 2020). The main trust of task performance are the ability to do the job and prior experience. In an organizational context, task performance is a contractual understanding between a manager and a subordinate to accomplish an assigned task. Entrusted task performance is broken into two segments: technical–administrative task performance and leadership task performance. The expected job performance comprising of planning, organizing, and administering the day-to-day work through one's technical ability, business judgment and so on are called as technical–administrative task performance. Leadership task performance is labeled through setting strategic goals, upholding the necessary performance standards, motivating and directing subordinates to accomplish the job through encouragement, recognition, and constructive criticisms (Borman, & Brush in Pradhan & Jena, 2020; Tripathy, 2019). Job performance in the context of task performance in this study is effectiveness with which job occupants execute their assigned tasks, that assists in realizing the fulfillment of organization's vision while rewarding organization and individual proportionately (Borman & Motowidlo in Pradhan & Jena, 2022). Task performance in relation to organizational formal reward system is the demonstrated skill and behavior that influences the direct production of goods or service, or any kind of activities that provides indirect supports to organization's core technical processes.

Adaptive Performance: It is an individual's ability to acclimatize and provide necessary support to the job profile in a dynamic work situation. Literatures have shown that once the employees derive a certain amount of perfection in their assigned tasks, they try to adapt their attitude and behavior to the varied requirements of their job roles (Huang, Ryan, Zabel & Palmer, 2019; Parker, Williams, & Turner, 2006). An effective adaptive performance necessitates employees' ability to efficiently deal with volatile work circumstances, for example, technological transformations, changes in one's core job assignment, restructuring of organization and so on (Baard, Rench, & Kozlowski, 2019). Evolutions of various new occupations as an offshoot of technological innovation need employees to engage in fresh learning and get oneself adaptable with changes in an efficient manner (Griffin, Parker & Mason, 2020). In view of this, employees are expected to adjust their interpersonal behavior in such changed circumstances to work successfully with a wide range of peers and subordinates. In the context of wholesome work performance, Griffin, Neal, and Parker (2019) cited that job proficiency may aid for task performance, but adaptability and pro-activeness to one's job role is important to address uncertain business environments.

Contextual Performance: This means helping or assisting other employees to adapt to the various job roles. Contextual performance consists of different dimensions such as teamwork, allegiance, and determination (Bergeron, 2019). Contextual performance is a kind of attitude like volunteering for extra work, helping others in solving difficult task, upholding enthusiasm at work, cooperating with others at the time of need, sharing critical resources and information for organizational development, abiding by the prescribed rules and regulations, and supporting organizational decisions for a better change (Coleman, & Borman, 2020; Motowidlo, & Schmit in Pradhan & Jena, 2019).

Measurement of Employee Performance

The most difficult part of the performance appraisal policy is to accurately and objectively measure the employee performance (Bond & Fox, 2017). Measuring the performance covers the evaluation of the main tasks completed and the accomplishments of the employee in a given time period in comparison with the goals set at the beginning of the period (Rudman, 2023). According to Kuvaas (2020), measuring also encompasses the quality of the accomplishments, the compliance with the desired standards, the costs involved and the time taken in achieving the results. Bond and Fox (2017) contend that measuring employee performance is the basis of performance appraisal policy and performance management. Accurate and efficient performance measurement not only forms the basis of an accurate performance review but also gives way to judging and measuring employee potential (Fletcher & Bailey, 2023).

For the purpose of measuring employee performance, different input forms can be used for taking the feedback from the various sources like the supervisor, peers and the employee (Mello, 2020). According to Rudman (2023), all the perspectives thus received should be combined in the appropriate manner and to get an overall, complete view of the employees' performance. According to Anderson (2022), for an organization to be effective for its goals, it is very important to monitor or measure its employee performance on a regular basis. Effective monitoring and measuring also includes providing timely feedback and reviews of the employees for their work and performance according to the predetermined goals and solving the problems faced (Mani, 2022). Rudman (2023) highlights that timely recognition of the accomplishment also motivates and helps to improve the performance of employees.

Theoretical Framework

This study was hinged on the resource based theory propounded by Wernerfelt (1984). According to Wernerfelt (1984) there are two major assumptions of the theory, namely, The heterogeneous nature of resources assumes that firms achieve competitive advantage when organization makes use of resources that are significantly different from that of competitors (Kim, Shin, kim & Lee, 2011). The second assumption of resource-based view theory is that firm's resources are non-movable and non-transferable that is, resources attributed to a particular company do not move from one company to another at least in a short run (Akio, 2005). A company achieves a competitive advantage when it has key resources (these can be physical resources, human resources or organizational resources) that its competitors do not have (Barney, 1991). Criticizing this theory, Carr and Pearson (2002) argued that a firm might lose its competitive advantage if important inventory management skills are scarce or getting lost as they are not easily duplicated or substituted. Another major drawback of RBV is that the theory is operationally invalid in the sense that it is only applicable in a static environment which is not the case for real life situation (Therious, Aggelidis & Theriou, 2009). Evidence of usage of this theory include Sulastri (2006) who argued that RBV approach is useful by employing various strategies in controlling inventories in the organization through optimal utilization and allocation to be more competitive and improve on performance. Resource based view theory has been largely criticized from the dynamic point of view and this view remains the most prominent of all other critical views. RBV theory is found very relevant to this study because the various strategies of

RBVcan be used in controlling inventories in the organization through optimal utilization. Similarly, timely usage of stock reduces the cost of keeping stock and the attendant associated problems

Relationship between Perpetual Inventory Management and Organizational Performance

Ogunniyi and Aliyu (2023) argued that perpetual inventory influenced the level of organizational performance as its related to inventory management and control. This according to the authors was because the adoption of perpetual inventory improved the information relevance of store management, thus, helping the employee at the store to be conversant of the little detailed that related to store management and control. Ojo (2023) opined that despite the shortcoming of perpetual inventory management practices it has been observed that its adoption and benefits overshadow the disadvantages. Hence, the inventory practice facilities effective store control and enhances the capacity of the store managers to be aware of very detailed necessary to improve store accounting, thus, decreasing both costs of holding and ordering stock. In this regard, Akinteju and Olumayo (2023) posited that perpetual inventory improves institutional store control level due to detail information provided to the store employee by the store management method. More so, Akinteju (2024) argued that for perpetual inventory management practice to enhance organizational performance, the inventory design must focused towards regular updating of inventory, delivery of up to date information, accurate capturing of inventory, increase information technology skills application and ensue different in real inventory taking. The variables are used as measurement of perpetual inventory management system in this study. As a result of this, the hypothesis to be tested for the study is restated as;

H_O: Perpetual inventory control practice has no significant effect on performance of selected polytechnics in Southwest, Nigeria**.**

Conceptual Framework
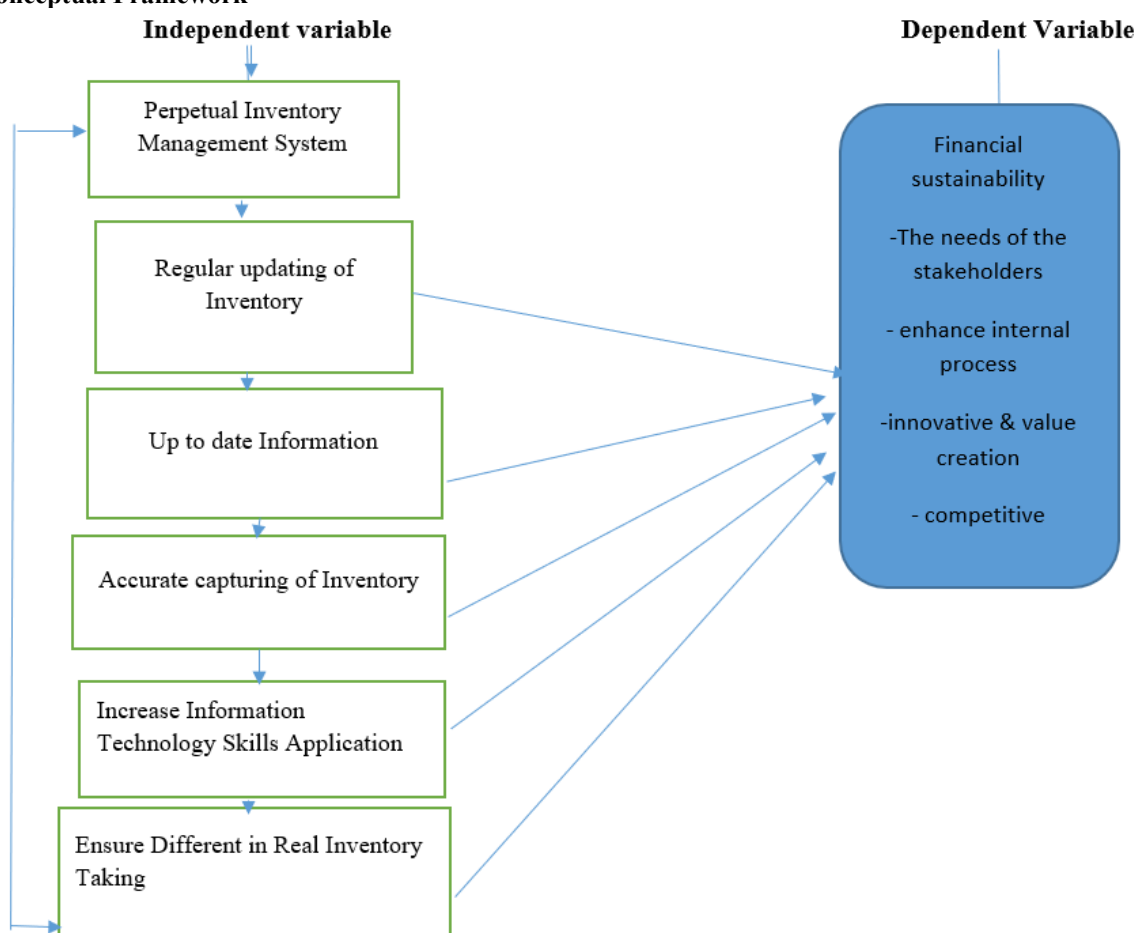
Source: Adapted from Ojo and Alawode (2022).

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Empirical Review

Nwangangi, Guyo and Arasa (2020) researched on how inventory management influenced the performance of manufacturing firms in Kenya. The research design adopted was both descriptive and explanatory. Data was collected from heads of logistic department of 320 firms through the use of questionnaire. A pilot study was conducted to test for validity reliability and practicability of the research instruments Descriptive static's such as parentages and frequencies was used, while the inferential statistics used was the linear regression. The entire data collected was executed through the use of the statistical package for social sciences, (SPSS) version 22. The findings revealed that improvement in inventory management by one unit will lead to increase in marketing performance, of financial performance and customer satisfaction by 0.300, 0.423 and 0.143 units respectively. The study also found that inventory management influenced all the constructs of measuring firm performance (Market performance, financial performance and customer satisfaction).

Anam, Talat and Shafique-Ur (2019) investigated Inventory management: information, coordination and rationality. The model of the study was based on the theoretical contextual. The population of the study comprised of online buyers in China. Purposive sampling technique was used to select the respondents who took part in the study. To achieve the goal of the study, 380 questionnaires were distributed while the data obtained was analysed using Smart PLSSEM. The findings of the study showed that adequate coordination and management of inventory build profitability and enhance employees' performance on the job. This study was conducted in a developed economy whereas the current study is been carried out in a developing economy. More so, the target population of the study is on online shoppers without a specific product or service in mind. The current study focuses on employees of polytechnics in south west Nigeria. Despite the contextual differences between the two studies, it is clearly stated that inventory management has effect on employees' performance.

Mbugi and Lutego (2022) investigated the effect of inventory control management systems on organization performance in Tanzania manufacturing industry: a case study of food and beverage manufacturing company in Mwanza City. The specific objectives of the study were to: determine the types and purposes of inventory control management practices followed ascertain the influence of inventory control management practices on organizational performance and determine how technology adopted in operationalization of inventory control management practices affect organization performance. In order to accomplish the objectives, qualitative approach method was adopted. Using purposive sampling, five participants in the inventory and production department were selected and interviewed. Data was analyzed using content analysis techniques with the aid of Nvivo Qualitative Analysis software. Other data was collected from documentary review company and industry published reports. The findings of the study revealed that the food and beverage manufacturing company had evidence of different types of inventories which included raw materials, work-in-progress and finished goods managed under FIFO system for cost reduction and production efficiency. It was also evident that the company carried inventory control management using perpetual inventory system done on periodic basis and inventory system is combined with a computerized database of inventory quantities at various locations for up-dating in real time by store and warehouse using barcode scanners. It was also revealed that inventory control management system using principles of Economic order quantity [EOQ] affects organizational performance in terms of cost reduction, production efficiency, flexibility and profitability.

Agu, Obi and Eke (2022) sought to ascertain the extent at which inventory control affect the productivity of selected manufacturing firms, to determine the nature of the relationship between demand management and customer satisfaction of selected manufacturing firms and to determine the effect of Just – in- time on the growth of selected manufacturing firms. The study had a population size of 996, out of which a sample size of 285 was realized using Taro Yemeni's formula at 5% error tolerance and 95% level of confidence. The instrument used for

data collection was primarily questionnaire and interview. Out of 285 copies of the questionnaire that were distributed, 270 copies were returned while 15 were not returned. The descriptive survey research design was adopted for the study. The hypotheses were tested using Pearson product moment correlation coefficient and simple linear regression statistical tools. The findings indicate that inventory control significantly affects productivity of selected manufacturing firms. There is a positive relationship between demand management and customer satisfaction of selected manufacturing firms. Just – in – time has a significant effect on growth of the selected manufacturing firms. The study concluded that inventory management is essential in the operation of any business. Inventory as an asset on the balance sheet of companies has taken on increased importance because many companies are applying the strategy of reducing their investment in fixed assets.

Akinlabi (2021) in his study examined the effect of inventory management practices on operational performance of selected flour mills companies in Nigeria. The study adopted cross-sectional survey research design. The target population comprised 2,237 staff of the selected flour mills companies. A stratified random sampling technique was used to select the sample size of 776. A structured self-administered survey questionnaire was adapted, validated and used for collecting data for the study. The Cronbach's alpha coefficients for the constructs ranged between 0.783 and 0.971. The response rate to the 776 copies of the questionnaire administered was 82.6%. Data were analyzed using descriptive and inferential (Pearson Product Moment Correlation and Regression Analysis) statistics. Finding revealed that automated inventory system was found to be positively and significantly related to operational performance. Inventory shrinkage was found to be negatively and significantly related operational performance. Inventory investment was found to be positively and significantly related to operational performance. Inventory record accuracy was found to be positively and significantly related to operational performance. Inventory turnover was found to be positively and significantly related to operational performance. The study concluded that inventory management practices significantly influenced operational performance of flour mills companies in Nigeria.

III.   Methodology

The study was conducted in southwest geopolitical zone of Nigeria. The Southwest is one of the zones of Nigeria representing both a geographic and political region of the country's Western Coast. It comprises six states- Ondo, Osun, Ekiti, Oyo, Ogun and Lagos. The zone was used because it has the highest number of polytechnics in Nigeria (NBTE, 2023). Beside this, all the polytechnics in the zone operate standard central store with sufficient number of staff required to execute this study. Additionally, the choice of the study area was informed by the increasing growth of polytechnic education in Ondo, Osun, Ekiti, Oyo, Ogun and Lagos, as well as the conducive and secured academic environment in the areas which pave way for research exercise. This study adopts survey research design. Survey research design is adjudged to be appropriate for this study because it provides an accurate account of the behaviour, opinions, beliefs, and knowledge of a particular individual or group through the use of questionnaire. The choice of the survey method is consistent with Hair, Money, Samuel and Page (2017) submission that such a method is usually interested in the assessment of the characteristics of the population of study. Besides, the survey research design helps to evaluate the implications and interrelationship between inventory management system and employees performance. The target population of the study comprises 736 management staff in selected polytechnics in Southwest, Nigeria. The management staff to be included in the study are the Rectors, Deputy Rector Academics, Deputy Rector Administration, Registrars, Deputy Registrars, Bursars, Directors in the bursary, Librarians, Deputy Librarians, Deans of Schools and Head of Departments of sixteen (16) Polytechnics in Southwest, Nigeria which had existed for minimum of ten (10) years prior to this study. Criterion sampling technique was adopted for the study. Criterion sampling involves the identification of a certain criterion of importance, articulation of this criterion and systematic review and study of cases that meet the criterion. In this study, only polytechnics (federal, state and private) that had existed for not less than ten (10) years from the period of conducting this study were selected. Subsequently, purposive selection of sixteen (16) polytechnics which had existed for 10 years and above prior to this study. Using year of establishment and a minimum of ten years prior to the time this study, four (4) federal, six (6) state and six (6) private polytechnics respectively were selected for the study. Primary data were used for the study. Primary data used for the study were sourced from the management staff of the sixteen selected Polytechnics used for the study and were collected with the aid of questionnaire The instrument used for primary data collection is the questionnaire. The questionnaire was exposed to content validity test by giving the draft copy of the questionnaire to a lecturer in the department of test and measurement, Obafemi Awolowo University, Ile-Ife. The comment and observations of the lecturer were integrated as part of the correction, thus, confirming that the instrument used for the study was valid. More so, the reliability test was carried out using Cronabach alpha coefficient that gave a reliability coefficient of 0.98, thus, affirming that the questionnaire used was reliable. The descriptive statistics and inferential statistics of Ordinary Least Square test (OLS) were used to investigate the objective of the study.

Model Specification

The model for the study followed the work of Akinjide and Ojo (2023) buy with slight modification that showed the inclusion of perpetual inventory management system parameters such as; regular updating of inventory, delivery of up to date information, accurate capturing of inventory, increase information technology skills application and ensue different in real inventory taking. Functionally, the model for this study is expressed as:

OPER = f (RUI, DUI, ACI, IITS, DRI)   (3.1)

In equation form, the functional model is redefined as;

$OERP = \alpha + \beta_1 RUI + \beta_2 DUI + \beta_3 ACI + \beta_4 IITS + \beta_5 DRI + \varepsilon$ (3.2)

Where:

OPER = Organizational Performance

RUI= Regular Updating of Inventory

DUI= Delivery of Up-To-Date Information

ACI= Accurate Capturing of Inventory

IITS= Increase Information Technology Skills

DRI= Difference in Real Inventory

Also, β_0 = Constant/Intercept

$\beta_1 - \beta_5$ = Regression Parameters to be Estimated

ε= Error Term

A priori Expectation for the Model Four

For this model it was expected that $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$ and $\beta_5 > 0$

IV.   Results and Discussion

Demographic Characteristics of Respondents

Table 1 Frequency Distribution of Respondents' Demographic Characteristics.

Demographic Variable	Frequency	% Percentage
Gender		
Male	474	65.83
Female	246	32.17
Age in years		
20-30	141	19.58
31-40	168	23.33
41-50	328	45.56
51 and above	83	11.53
Educational Qualification		
HND/B.Sc.	515	71.53
MBA/MSC/MA	145	20.14
Ph.D.	-	-
OTHERS	60	8.33
Years of working Experience		
1-5	133	18.47
6-10	281	39.03
11-15	178	24.72
16 and above	128	17.78
Marital Status		
Single	84	11.67
Married	580	80.56
Divorced	30	4.17
Widow	26	3.61

Source: Researcher's Fieldwork, 2024

Table 4.1 presented the frequency distribution of respondents' demographical characteristics. Looking at the result in the table, the frequency distribution of respondents by gender revealed that 65.83% of the respondents in the selected polytechnic in South-west Nigeria were male while 32.17% of the respondents were female. This indicated that a substantial number of the respondents were male. As a result of this, any opinion generated from this category of respondent might influence the outcome of the study.

More so, the frequency distribution of respondents according to age in years showed that 19.38% of the respondents were between 20-30 years of age while 23.33%, 45.56% and 11 the.53% respondents were 31-40, 41-50 and 51 and above years of age. This implied that an adequate number of the respondents were 41-50 years of age, invariably, the variable might influence the way the respondents responded to the test statement.

In addition, the frequency distribution of respondents by educational qualification revealed that 71.53% of the respondents had HND/BSC while 20.14% and 8.33%% of the respondents had MBA/MSc/MA and others such as professional certificates in Store- keeping and purchasing and supply and procurement respectively. The result revealed that a sufficient number of the respondents had HND/BSC. This variable might affect positively the way the respondents rated the test items on inventory and employees performance.

Furthermore, the frequency distribution of respondents by years of working experience indicated that 18.47% of the respondents had between 1-5 years of working experience on the job while 39.03%, 24.72% and 17.78% of the respondents had 6-10, 11-15 and 16 and above years of working experience on the job. This implied that a substantial number of the respondents had 6 -10 years of working experience as store keepers. This variable might influence greatly the outcome of the study.

Also, the frequency distribution of respondents by marital status showed that 11.67% of the respondents were single while 80.56%, 4.17% and 3.61% of the respondents had married, divorced and widowed respectively. This implied that a substantial number of the respondents had married, thus, enabled diversity in opinions of the respondents regarding the test items.

Mean and Standard Deviation Computed for the variable of Perpetual Inventory Practices

S/N	Variable	N	Mean	STD	Rank	Remark
1	Regular updating of inventory records and accounts has enhanced my skills.	720	4.21	0.76	1st	A good determinant of PIMS
2	Perpetual inventory control systems assist me with delivery up-to-date inventory information skills.	720	4.15	0.78	2nd	A good determinant of PIMS
3	PICS is fast and accurate in capturing inventory on continual basis.	720	4.10	0.87	4th	A good determinant of PIMS
4	Reliance on technology to manage PICS has increased my ICT skills.	720	4.05	0.86	3rd	A good determinant of PIMS
5	Consistent inventory system PICS cause recorded inventory to be the same with real inventory overtime	720	4.13	0.89	5th	A good determinant of PIMS

Source: Researcher's Fieldwork, 2024 ** Acceptable mean =3.00 on a five point likert scale ** A test item was a good determinant of PICS if mean calculated> or equal to 3.00 or otherwise **STD= Standard Deviation **Rank was done on the basis of STD

Table 2 presented the result of the mean and standard deviation computed for the variables of perpetual inventory management system. Checking the result in the Table, it was discovered that the respondents agreed with all the test items. This inferred was hinged on the fact that the mean values computed for the five test items were far greater than the acceptable mean of 3.00 with standard deviation that showed slight dispersion from the mean. As a result of this, one could say that perpetual inventory management system enhanced regular updating of records and accounts, thus, facilitating better accountability in the selected polytechnics. More so, with perpetual inventory management system the capacity of the polytechnics to improve performance as regarding inventory control and management improved by utilizing PIMS that helped in delivery up to date inventory information, capturing inventory that was on continuous basis, improving employees skill due to reliance on technology and removing possible in fluctuation that might occur between recorded inventory and real inventory.

Table3 Mean and Standard Deviation computed for the variable of Organizational Performance

S/N	Variable	N	Mean	STD	Rank	Remark
1	Inventory management practices adopted has helped this institution to be financially sustainable	720	4.08	0.97	3rd	Enhanced Performance
2	Inventory management practices adopted has helped this institution to meet the needs of the stakeholders	720	4.13	0.82	2nd	Enhanced Performance
3	Inventory management practices adopted enhances the internal processes of this institution	720	4.21	0.74	1st	Enhanced Performance
4	Inventory management practices adopted has helped this institution in its innovativeness and value creation	720	3.80	1.04	5th	Enhanced performance
5	Inventory management practices adopted has helped this institution to remain competitive in the educational sector.	720	4.04	0.98	4th	

Source: Researcher's Fieldwork, 2024 ** Acceptable mean =3.00 on a five point likert scale ** A test item had enhanced performance if mean calculated> or equal to 3.00 or otherwise **STD= Standard Deviation **Rank was done on the basis of STD

Table 3 presented the mean and standard deviation obtained for the respondents' perception of the variable of organizational performance. Checking the result in Table 4, it was discovered that with the aid of period inventory system, organization performance might increase. The performance of the selected polytechnics especially with regard to financial sustainability as regard inventory control, meeting the needs of stakeholders, effective internal control, enhanced innovation and value creation and ensue competitiveness had been enhanced

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through the adoption of period inventory system. This assertion was hinged on the fact that the mean value obtained for all the test items of performance were fact greater than the acceptable mean of 3.00 with standard deviation that indicated slight variability from the mean.

Test of Hypothesis

H_0: Perpetual inventory control systems have no positive and significant effect on organization performance in selected polytechnics in Southwest, Nigeria**.**

Objective Four: Evaluate the effect of perpetual inventory management control systems on employees' performance in selected polytechnics in Southwest, Nigeria.

Table 4 Regression Result

Dependent Variable = Organization Performance (OPER)

Variable	Coefficient	Standard Error	Z-calculated	P-value
C	10.38730	0.624062	16.64465	0.0000
RUI	0.681330	0.132641	5.136631	0.0000
DUI	0.187738	0.028313	6.630806	0.0000
ACI	0.525140	0.119471	4.395530	0.0000
IITS	0.446284	0.104414	4.274194	0.0000
DRI	0.633980	0.099801	6.352428	0.0000
	OTHER	**TEST**	**STATISTICS**	
R-squared	0.395168		Mean dependent var	20.76462
Adjusted R-squared	0.390219		S.D. dependent var	2.544231
S.E. of regression	2.143477		Akaike info criterion	11.37157
Sum squared resid	3271.279		Schwarz criterion	11.49300
Log likelihood	-1563.209		Hannan-Quinn criter.	11.35823
F-statistic	59.63409		Durbin-Watson stat	1.748414
Prob(F-statistic)	0.000000			

Source: Researcher's computation, 2023 *Components of Perpetual Inventory Management System *RUI= Regular Updating of Inventory *DUI= Delivery Up-to-Date Information *ACI= Accurate Capturing of Inventory* IITS = Increase Information Technology Skills *DRI= Difference in Real Inventory

Table 4.11 presented the result of Ordinary Least Square (OLS) computed to investigate the fourth objective of the study and test the null hypothesis four. Looking at the result in the table, it was found that the relationship between regular updating of inventory (RUI) and performance of the selected polytechnics was positive and significant. This assertion was premised on the fact that the regression coefficient computed for the variable of RUI of 0.68 was positive with a significant t-statistics of 5.14. The values indicated that a unit increase in the regular updating of perpetual inventory that enhanced the skills of the employees of the central store might cause a 0/68% increase in the performance of the selected polytechnics. The sign of the variable of RUI was in conformity with a priori expectation for the variable; hence, RUI was a good variable in perpetual inventory that enhanced the performance of the polytechnics since the variable was significant. It was discovered that the p-value of the t-statistics computed for the variable of RUI of 0.0000 was less than the critical value of 5%. This indicated that RUI was significant on the performance of the polytechnics. The implication of this was that with perpetual inventory control practices the employees of the central store were taught how to regularly update inventory in order to enhance the accuracy and determination of the various inventory control level, thus, enhancing the estimation of inventory cost that might influence the financial performance. With this knowledge of regular updating of inventory and accounting the skills of the central store employees might improve, thus, contributing significant to the performance of the polytechnics particularly regarding the supply of correct information on inventory cost and other control estimations in the store. This added to the level of management probity, accountability and transparency as regard inventory management. This improved the performance of the polytechnics and management in this regard. Perpetual inventory did not give room for laziness and lackadaisical attitudes on the part of store employees since they needed to update stock records on a regularly basis in order to have the correct picture of stock balances. This regularity in updating stock and accounting for stock improved in no small measure the skills of the central store employees, thus translating to better performance in stock management for the selected institutions.

Moreover, the result in the Table 4.12, further showed that the effect of the variable of delivery up-to-date inventory information (DUI) on performance of the polytechnics was positive and significant. This inferred was premised on the fact that the regression coefficient computed for the variable of DUI of 0.19 was positive

with an insignificant t-statistics value of 6.63 the value indicated that a 1% increase in the variable of DUI might result in 0.19% increase in the performance of the selected polytechnics. The sign of the variable of DUI was in tandem with a priori expectation for the variable. As a result of this delivery up to date inventory information was one of the factors that influenced the performance of the selected polytechnics positively. Also, the p-value of the t-statistics calculated for the variable of DUI of 0.0000 was less than the critical value of 5%. This implied that the null hypothesis which stated that delivery up-to-date inventory information was not significant on the performance of the selected polytechnics was rejected. The implication of this was that the capacity of the central store employees in delivering to the management up to date inventory information needs of the polytechnics, had received adequate attention from the management. This further pointed to the fact that management supported the work of the central store by implementing the central managers' suggestion on how to improve the various inventory control system adopted by the polytechnics. As a result of this, each directorate, unit, department and collegiate in the selected polytechnics must as a matter of priority implement adequately the various suggestions and decision of the management regarding the central store materials requisition, usage and materials management. This according to Akinjobi (2023) is the only way the central store management may influence the performance of the organization in relation to effective management of resources in the store. Thus, the polytechnics performance with regard to accurate determination of the various inventory control levels, accurate determination of total cost of inventory and effective assessment of economic order quantity might improve due to management support to implement or use the information supply by the central store. This enhanced the essence of inventory management practices, thus, decreasing the institution exposure to the activities of unscrupulous store officials that might to manipulate the inventory information for personal aggrandizement.

More so, the effect of the variable of accurate capturing of inventory (ACI) on a continuous basis on performance of the selected polytechnics was positive and significant. This statement was hinged on the fact that the regression coefficient obtained for the variable of ACI of 0.52 was positive with a significant t-statistics value of 4.40. The regression coefficient showed that a 1% increase in the variable of ACI might cause a 0.52% improvement in the performance of the selected polytechnics. The sign of the variable of ACI was in tandem with a priori expectation for the variable. Therefore, ACI was a better factor in perpetual inventory control that enhanced the performance of the selected polytechnics in South-West, Nigeria. The result in Table 4.12 further showed that the p-value of the t-statistics computed for the test item of ACI of 0.0000 was less than the critical value of 5%. This implied that the variable of ACI was significant on the performance of the polytechnics. The indicated that with perpetual inventory system the capacity of the central store employees to capture inventory on a continuous basis was fast and accurate. This was so because in continuous inventory practice of the central store were expected to continuous updated inventory information in order to determine the correct material's needs of the store. This improved the information needs of the polytechnics by ensuring that accurate information on inventory was adequately disseminated to the central accounting for onward computation of the correct income statements of the organizations. With this in mind, the desired of the polytechnics to have accurate cash flow statement that reflected correct financial events in the polytechnics improved, thus, enhancing the polytechnics performance in this regard. On this note, Ojo (2023) opined that perpetual inventory management model due to its capacity to handle inventory on a continuous gives better picture of the various stock control level, hence, adding meaning to the value of stock information sharing.

It was found from the result in Table 4.12 that the effect of increase information technology Skills (IITS) on the performance of the selected polytechnics was positive and significant. This inferred was based on the fact that the regression coefficient for the variable of IITS of 0.45 was positive with a significant t-statistics value of 4.27. The regression value showed that a 1% increase in the variable of IITS might cause a 0.45% increase in the performance of the selected polytechnics. The sign of the variable of IITS was in tandem with a priori expectation for the variable. As a result of this increased IITS was a good factor in perpetual inventory system that boosted of the performance of the polytechnics. More so, it was noted that the p-value of the t-statistics computed for the variable of increased IITS of 0.0000 was less than the critical value of 5%. This implied that the null hypothesis which stated that increased IITS was not significant on the performance of the organization was rejected. It was essential to infer that increase in IITS was significant on the performance of the selected polytechnics. Perpetual inventory control system involved the application of relevant Information Technology software that aided easy simplification of inventory management. With this software managing store level became easy and determination of the various stock control levels became essential simple and flexible to obtain by the store managers. The inventory management software above all exposed the central store managers to the application of IT in inventory management particularly inventory on a continuous basis, thus, enhancing the skills of the central store employees in this regard. Having this in mind, the performance of the central store managers and his assistants regarding effective management of inventory on a continuous basis increased, hence, contributing to the performance of the polytechnics by helping to disseminate accurate and timely information on inventory levels and its associated costs to the management, thus, enhancing management decision regarding stock levels and how this had influenced the financial performance of the polytechnics.

Furthermore, the relationship between recorded inventory to be equal to actual inventory or otherwise called difference in real inventory (DRI) and organizational performance in perpetual inventory practices was found to be positive and significant. This inferred was based on the fact that the regression coefficient computed for the variable of DRI of 0.63 was positive with a significant t-statistics value of 6.35. The value revealed that a 1% increase in the variable of DRI might cause a 0.63% improvement in the performance of the selected polytechnics. The sign of the variable of DRI was in tandem with a priori expectation for the variable. Therefore, DRI was one of a good variable of perpetual inventory system that enhanced the organizations performance. Also, the p-value of the t-statistics calculated for DRI of 0.0000 was less than the critical value of 5%. This showed that the variable of DRI was significant on the performance of the polytechnics. One of the advantages of the perpetual inventory practice was that, it made the budgeted inventory to be equal to the actual inventory, thus, allowing an organization to be able to plan for the next financial year. With this, the selected polytechnics using perpetual inventory control management might be able to know whether the polytechnics were committing much investment in inventory expenditures. For instance, in a situation whereby actual inventory exceeded budgeted inventory was an evidence of more investments had been committed to inventory. This called for the need for the polytechnics to adjust its investment in inventory in order to accelerate other performance indicators of the institutions. In addition, if the real inventory was less than the budgeted inventory was an evidence of less resources were committed to inventory, thus, indicating the fact that the polytechnics performance with regard to inventory management had improved, hence, in this situation cost savings was possible. In a case real inventory was equal to budgeted inventory indicated an evidence of judicious used of the current year inventory budget. This improved the inventory performance of the polytechnics in this regard.

The result of other test statistics computed for the test revealed that perpetual inventory control practice improved the performance of the polytechnics greatly if the right tools were available for its implementation. For example, the coefficient of determination (R^2) obtained for the test of 0.40 revealed that approximately 40% of the polytechnics performance regarding inventory management was as a result of the perpetual inventory management practice. Therefore, perpetual inventory management was a good predictor for the performance of the institutions. In continuation, the p-value of the F-statistics computed for the test of 0.0000 was less than the critical value of 5% with a significant statistics of 59.63. The values indicated that the joint null hypothesis which stated that perpetual inventory control systems had no positive and significant effect on performance of the selected polytechnics in Southwest, Nigeria was rejected. On this basis, it was saved to assert that perpetual inventory control systems had a positive and significant effect on the performance of the selected polytechnics in Southwest, Nigeria. The result of the information criterions computed for the test showed that perpetual inventory control practice gave a better information on the performance of the polytechnics. All deviances and restrictions for the test were within acceptable limit. This implied perpetual inventory management truly if in used in the selected polytechnics might influence the performance of the institutions greatly. Meanwhile, the Durbin-Watson statistics calculated for the test of 1.748414 showed that there was no serial correlation between the variables of perpetual inventory and performance of the selected polytechnics. As a result of this, it might be asserted that truly perpetual inventory system boosted the performance of the selected polytechnics.

V. Conclusions and Recommendations

Conclusions

This study had revealed that the application of perpetual inventory in polytechnics that dealt with inventory on continuous basis enhanced the performance of the said institutions. Based on the finding of the study, the study concluded that regular updating of inventory as a perpetual inventory variable increased the performance of the selected polytechnics. Perpetual inventory system of delivery up to date information enhanced the performance of the Polytechnics. More so, the capability of PIMS to accurately capture inventory information contributed positively to the performance of the polytechnics as regard inventory management. Also, perpetual inventory improved the application of information technology skills, thus, leading to increase store employee efficiency and effectiveness. In addition, the accuracy of perpetual inventory management system had eliminated possible in fluctuation that might occur between expected inventory and real inventory, thus, contributing to better inventory data in the selected polytechnics.

Recommendations

The following recommendations are made.

- Regular up-dating of inventory record must be enshrined by the management of the Polytechnic using the Perpetual Inventory system.
- More so, for the perpetual inventory practice adopted by the polytechnics to deliver up to date inventory information there is need for the management of the polytechnics to upgrade their stock taking and recording software and application to current and modern stock taking software.

- More so, the management of the Polytechnics must allocate special funding fro their subvention to upgrading of relevant information software and applications that could aid the adoption of PIMS.

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