

**INVENTORY MANAGEMENT TECHNIQUES AND SERVICE DELIVERY IN THE  
PUBLIC SECTOR ENTITIES IN UGANDA**

**A CASE STUDY OF CIVIL AVIATION AUTHORITY (CAA), ENTEBBE-UGANDA**

**BY**

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## **DECLARATION**

I NALUBOWA RUTH confirm that this is my individual research work and that it has never been submitted to any Institution for the award of any academic qualification. Any content that is not my original work is explicitly described and recognised.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

**APPROVAL**

This is to confirm that this piece of work has been presented with my consent as the University Supervisor.

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**MAY GOD BLESS YOU ALL**

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## LIST OF ACRONYMS

ABC	Activity Based Costing
CAA	Civil Aviation Authority
EOQ	Economic Order Quantity
FIFO	First in First Out
JIT	Just In Time
LIFO	Last In First Out
MRP	Material Requirement Planning
SKU	Stock-Keeping Units
SPSS	Statistical Package for Social Scientist
UNRSCE	UN Regional Service Center
VMI	Vendor Managed Inventory
WIP	Work In Progress

## **ABSTRACT**

This study assessed the effect of Inventory Management techniques on Service Delivery in public sectors of Uganda-while focusing on Civil Aviation Authority, Entebbe-Uganda as a Case Study. It was directed by three explicit objectives: to examine how inventory analysis techniques affects service delivery, to assess the effect on inventory control techniques on service delivery, and to establish the effect inventory counting system techniques on service delivery in Civil Aviation Authority. The study embraced a case study research design using both qualitative and quantitative methods integrating descriptive and inferential statistics. The objective populace of the study were CAA staff, from which a sample of 86 respondents was determined with the use of both purposive and simple random sampling techniques where a response rate of (94%) was obtained. Questionnaires and interviews raw data obtained was analysed.

In relation to inventory analysis techniques and service delivery, the results indicated that inventory analysis techniques have a remarkable impact service delivery. The use of ABC technique has been critical to the operational performance of the organization hence improved service delivery to the customers. Based on the study it was inferred that CAA has endeavoured to optimize supply chain efficiency, lowered operating costs, and meet customer service targets with the use of EOQ. It was concluded that the process of stock counting at CAA was tedious and boring exercise that demands for employees' proper motivation to ensure its success. The researcher recommended CAA to embrace the ABC model in principle and develop an appropriate inventory strategy that will provide the output with the best possible quality of service while reducing investment costs it was also the researcher recommended CAA to employ more staff to easy the process of stock counting.

## **CHAPTER ONE: INTRODUCTION**

### **1.0 Introduction**

The study assessed the effect of inventory management techniques on service delivery in the public sector of Uganda, taking Civil Aviation Authority- Uganda as a case study. Inventory Management practice in the study was the independent variable, whilst service delivery was the dependent variable. The chapter presents a brief background to the research, statement of the problem, the purpose of the study, research objectives and questions, hypothesis of the study, the scope and significance of the study.

### **1.1 Background to the Study**

For many reasons, research into the outcome of inventory management on service delivery is important. First, it could help public agencies establish efficient and effective inventory policies that would allow them to implement inventory policies in order to be successful in their downstream activities. In our case report, the report acted as a management policy guide for relevant parties, as it exposed the nature of resource management activities of the company and the nature of service delivery to clients (Wang, 2016). The background to this research was built basing on four points of view that include: Historical, Conceptual, Theoretical and Contextual background.

#### **1.1.1 Historical Perspectives**

Historically, Adam is the originator of inventory management when called all the animals. Prior to the modern transformation, merchants for all intents and purposes needed to record all the products they were selling each day. Definitely, merchants could not account for the stolen goods until they had regular, time-consuming, physical counts (Binti, 2016)

In the world today, every organization wants not only to mitigate the system wide cost, but also to maintain minimum inventories along the supply chain while maximizing the service

delivery requirements to the customer (Hines, 2014) Effective inventory management techniques benefits organisations in terms of cost of production, timely production and customer satisfaction.

Managing stock effectively is important for any organization, running a Civil Aviation Organisation is no exception because without enough stock, clients will come to a halt. Stock represents the largest single investment in assets for most organizations (Aissaoui, 2007). The basic reason why stock is held is so as to avoid stock out and its resulting problems. The extent of the stock is influenced by operational needs of the organization, time required to obtain deliveries of stock, availability of capital, cost of storage and the need for detailed records in the form of effective inventory management techniques.

Although there have been several research in the area of inventory and supply chain management in ensuring organizational performance, little studies have been done to view the role of inventory management techniques in Civil Aviation Industry especially in Uganda. However, considering the issue of cost reduction, timely services, and client satisfaction, there was need for a focal study in this area as inventory management techniques (Aissaoui, 2007)

Many corporations within the developing countries including Uganda face many problems, ensuring efficient service delivery being one of the major keys. Selection of good inventory management techniques appears to be complex among the different government organisations. For instance, Civil Aviation Authority as a business enterprise was established 1994 with the mandate to coordinate and oversee Uganda's aviation industry together with Licensing, law, air search and rescue, air site visitors manipulate. The agency is on a drive to reduce inventory costs, improve client satisfaction and ensure timely services delivery. However, the organisation had been faced with a lot of supply disruption and uncertainty

which threatened service provision, client satisfaction. This was evidenced in the Financial Year Quarter three (FYQ3) report for 2017/2018 where a stock count exercise indicated that CAA was holding unproductive inventory worth UGX 60.2m. This inventory was too much and raised an alarm that inventory was bought and accumulated without being used which was attributed to systems in inventory management techniques adopted by the organisation. From this context, the researcher investigated the effect of inventory management techniques on service delivery.

### **1.1.2 Theoretical Perspective**

There are many theories that attempt to discuss the relationship that exists amongst the study inventory management and service delivery. However, this study was based on the Economic order quantity model. “EOQ refers to the optimal ordering quantity for an item of stock that aids in the minimization of costs” (Munyao, 2015). There is a foregone conclusion that in this inventory management technique, there is an established demand for items, the lead time is set, orders occur instantly and there are no inventory shortages.(Munyao 2015) observes that (EOQ) model is an approach that takes account of the inventory carrying cost, inventory storage costs and overall costs to assess acceptable inventory levels to be held.

Van der Veen (2014) revised the EOQ version to comprise sustainability concerns that consist of environmental and social standards addition to traditional economics. The authors proposed fashions for a number of distinct settings and examined these revised fashions. Primarily based on the author’s analysis, they confirmed how these extra standards could be appended to conventional value accounting in order to cope with sustainability in deliver chain management for powerful carrier transport. The authors proposed a number of beneficial and practical insights for managers and coverage makers.

Economic order quantity was being used by CAA procurement department to plan their inventory replenishment on a timely basis such as quarterly, monthly, half yearly or yearly basis. By doing so, it had overtime influenced CAA inventory management decisions about the level of inventory to have on hand, how many products to buy each time and how frequently to reorder in order to ensure effective service delivery to the clients.

The researcher used the model to review inventory systems and ascertained how inventory was monitored at all times and how a fixed quantity was ordered each time the inventory level reached a specific reorder point. The theory was relevant to this study as it suggested that the appropriate or optimum level of stock needed by CAA to ensure routine effective and efficient service delivery to the clients.

### **1.1.3 Conceptual Perspectives**

The study was based on two major variables inventory management techniques as an independent variable and service delivery as the dependent variable. Inventory is defined as, the total list of products in which the quantity of goods in stock or stock is generated for sale by an entity (Aro-Gordon, 2016)

Deveshwar (2013) refers to inventory management techniques as to methods that companies use to organize, store, and replace inventory, to keep an adequate supply of goods at the same time minimizing cost. Choi (2012) indicates that effective inventory management is essential in the operation of any business. Thus, companies to meet customers' needs without taking the risk of frequent shortages while maintaining high service level use inventory management techniques as an important strategy.

The study used inventory analysis techniques, inventory control techniques, and inventory counting techniques to reflect the independent variables and how they affect assess service delivery at CAA.

The inventory analysis technique is comprised of ABC Approach, SDE analysis, and FSN analysis. According to Balagi (2014) ABC approach expresses that, when looking into stock, an organization should rate items from A to C, putting together its evaluations with respect to the significance of the material, to give by and large assurance against stock outs . The SDE is an examination that exceptionally helpful with regard to supply shortage for it relies on the items ease of access (KUMAR, 2014) FSN stands for fast-moving, slow moving and non-moving. Here, the order depends on the example of issues from stores and is valuable in controlling out of date quality (Brintha 2000).

The inventory counting techniques included stocktaking and cycle counting. 'The physical checking of the quantity and condition of goods kept in an inventory is stocktaking. This requires the physical check of the state of the counted items'(Shajema, 2018).

On the other hand service delivery is a business aspect that defines the interaction between clients and providers where service is offered by the providers, and the clients either loses value or finds value as a result (Ogbo, 2014) For instance, (Mosadeghrad, 2013) depicted service delivery as the relationship between policy makers, service providers and poor people. The researchers used accessibility, availability, reliability and quality of services as a measure of service delivery. However, this current study conceptualized as service delivery cost reduction, timely service, and citizen satisfaction

#### **1.1.4 Contextual Perspective**

In many developed countries, the issue of efficient inventory management strategies had been essential to successful operation of business however many large and small businesses in developing countries are still struggling with the process of avoiding stock-outs and reducing costs like ordering and holding costs (Ballou, 2007)



In Uganda, it is believed that poor inventory control in many institutions that is the uncertainty and variability of the timing and content of information flow and goods flow leads to increased costs, stock outs and delays. (Ballou, 2007) ,In his study recommends to take measures especially on inventory management to deal with uncertainties and dynamics that affect the service delivery of every organisation. However, in order for this to be effective, the choice of inventory management technique to ensure effective service delivery has always remained a bigger obstacle among many business enterprises including Civil Aviation Authority (CAA).

At Civil Aviation Authority (CAA), the impact of inventory management cannot be brushed aside in an effort to seek for good service delivery. The organisation has faced many problems, selection of a good inventory management technique being one of the majors. The organisation was structurally and systemically fragile and weak to provide effective service where it was most needed. Understocking and overstocking appeared to have complicated the situation and made matters worse and this affected service delivery in terms of customer satisfaction and facility maintenance (CAA Annual Report, 2017). The researcher believed that in order for an organization such as CAA to enhance its inventory management, it was important to dig deeply into potential inventory management strategies, inventory tracking strategies and inventory counting method techniques adopted by the company with the goal of minimizing inventory costs, maintaining good customer service and reducing process interruptions for productive service delivery.

## **1.2 Statement of the Problem**

Although it has been cited that organizations that adopt effective inventory management techniques, inventory control techniques, and inventory counting system techniques have recorded a better performance in terms of service delivered to their customers and also gained

better ‘competitive advantage over their competitors in the same industry’s Ukpere, (2011). At CAA, a number of these techniques were used to resolve two key issues that, effective organisational facility maintenance and effective service delivery to customers (CAA Master Plan, 2018).

Despite the emphasis to do all that, CAA was still facing challenges such as stock out, obsolete items and pilferages due to poor strategic inventory management systems techniques thus leading to declined service Delivery (CAA Annual Report, 2017) According to this report, CAA was keeping a large number of non-productive stock for write off which represented a bigger loss to the organization. It was therefore against this backdrop that the researcher desired to participate in determining the effect of inventory management techniques on service delivery in Uganda's public sectors while concentrating on the civil aviation authority, Entebbe-Uganda.

### **1.3 Purpose of the Study**

The purpose of the study was to assess the effect of Inventory Management techniques on Service Delivery a case of Civil Aviation Authority, Entebbe-Uganda.

### **1.4 Objectives of the Study**

- 1) To examine how inventory analysis techniques affect service delivery at the Civil Aviation Authority.
- 2) To assess the effect on inventory control techniques on service delivery at the Civil Aviation Authority.
- 3) To establish the effect inventory counting system techniques on service delivery at Civil Aviation Authority.

## **1.5 Research Questions**

2) What is the effect of inventory analysis techniques on service delivery at the Civil Aviation Authority?

2) What is the effect of inventory control techniques on service delivery at the Civil Aviation Authority?

3) What is the effect of inventory counting system techniques on service delivery at the Civil Aviation Authority?

## **1.6 Scope of the Study**

The scope of the study includes time scope, geographical scope and content scope.

### **1.6.1 Context scope**

The analysis focused on inventory management, and service delivery. The independent variable focused on three objectives: finding out how the use of inventory analysis techniques and inventory control techniques affects service delivery at the Civil Aviation Authority, finding out how the use of inventory counting techniques affects service delivery at the Civil Aviation Authority, and also establishing the relationship between inventory management techniques and service delivery at the Civil Aviation Authority.

### **1.6.2 Geographical Scope**

The research was performed at CAA- Entebbe whose head offices are located at Entebbe international airport, approximately 40kilometers (25mi) south of the City of Kampala. CAA situated to a coordination of 0° 02' 23.0"N and 32° 26' 53.0"E.

### **1.6.3 Time Scope**

The study considered relevant information covering a period of five years of CAA records from 2011-2016. This period was considered appropriate because, since the establishment of CAA, significant inventory management failures had been noted subsequently thus affecting

service delivery.

### **1.7 Significance of the Study**

Gonzalez (2010) noted that management and staff have minimal knowledge on how to apply the economic order quantity which negates the success of an organization. Humanitarian Organizations ought to train their staff who engage in procurement since systems cannot work by themselves. This research was important to various interested parties, including management, academics, suppliers, customers and governmental organizations.

Government: The findings might also help district leaders (local government official) to know the significant roles played by effective inventory management on the service delivery of public sectors.

Policy Makers: This will inspire retail businesses and decision-makers to devise effective strategies, technology and training to ensure complete understanding of inventory management, allowing good use of this for forecasting and planning purposes.

Management: The analysis can help the CAA management develop robust practices to reflect the value of an organization's inventory management strategy.

Academicians and practitioners: This will expose clear trends in resource management strategies that would further enable public sector management to adopt this strategy and potentially enhance service delivery. The research aims at tackling this problem systematically.

### **1.8 Definition of key variables**

#### **Inventory**

Inventories are materials and supplies that business or institutions carries for sale or provide input or supplies to the production process (Gupta, 2020).

### **Inventory management**

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory (Benton, 2020). This process usually involves controlling the transfer of units in order to prevent the inventory from becoming too high, or dwindling to level that could put operations of the company in to jeopardy. Competent inventory management also seeks to control cost associated with inventory (Gupta, 2020).

### **Service delivery.**

Service delivery is a business aspect that defines the interaction between clients and providers where service is offered by the providers, and the clients either loses value or finds value as a result. Good service delivery provides clients with value increase (Ogbo, 2011).

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This section is divided into three sections which include; theoretical review, literature survey, the conceptual model and the review of literature. The literature survey highlights the previous studies carried out locally and identify a research gap the study intends to cover.

#### 2.1 Theoretical review

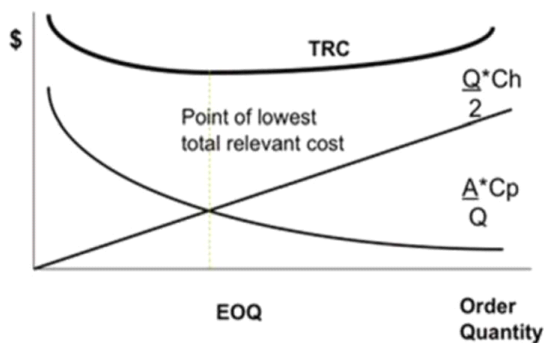
There are many theories that attempt to discuss the relationship that exists amongst the study inventory management and service delivery. However, this study was based on the Economic order quantity model. “EOQ refers to the optimal ordering quantity for an item of stock that aids in the minimization of costs”(Munyao, 2015). It is one of the oldest classical production scheduling models. The model was developed by Ford W.Harris in 1913, but R.H Wilson, a consultant who applied it extensively and K.Andler are given credit for their in-depth analysis. In this inventory management technique, there is an established demand for items, the lead time is set, orders occur instantly and there are no inventory shortages.(Munyao, 2015) observes that (EOQ) model is an approach that takes account of the inventory carrying cost, inventory storage costs and overall costs to assess acceptable inventory levels to be held.

Van der Veen (2014) revised the EOQ version to comprise sustainability concerns that consist of environmental and social standards addition to traditional economics. The authors proposed fashions for a number of distinct settings and examined these revised fashions. Primarily based on the author’s analysis, they confirmed how these extra standards could be appended to conventional value accounting in order to cope with sustainability in deliver chain management for powerful carrier transport. The authors proposed a number of beneficial and practical insights for managers and coverage makers.

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#### Economic Order Quantity (EOQ)



Yearly Holding Cost + Yearly Ordering Cost

EOQ Formula

$$\sqrt{\frac{2 * A * Cp}{Ch}}$$

Figure 2.1: Economic Order Quantity (EOQ)

A = Demand for the year, Cp = Cost to place a single order, Ch = Cost to hold one-unit inventory for a year

Source: (Teng, 2003)

## **2.2 Literature survey**

Finally, Ogo (2014) also sought to determine the relationship between effective system of inventory management system and organizational performance in the Seven-up Bottling Company in Enugu, Nigeria. They concluded that organizations benefit from inventory control management by way of easy storage and retrieval of material, improved sales effectiveness and reduced operational cost. The study also found that there is a relationship between operational feasibility, utility of inventory control management in the customer related issues of the organization and cost effectiveness technique are implemented to enhance the return on investment in the organization. Effective inventory control management is recognized as one of the areas management of any organization should acquire capability.

Beigbeder, (2016) examined the effect of inventory management processes at the UN regional service center; it examined how Unproductive inventory is managed at the UN regional service center; to find out the difficulties of inventory management at UN regional service centre. The study revealed that UNRSCE have effective and efficient techniques of managing these unproductive inventories. The findings further confirmed that UNRSCE manages their unproductive inventory through disposing them off. UNRSCE employed a re-order level system in the management of their inventories. However, her study also never looked at inventory monitoring and the relationships between stock outs and the performance of the organizations

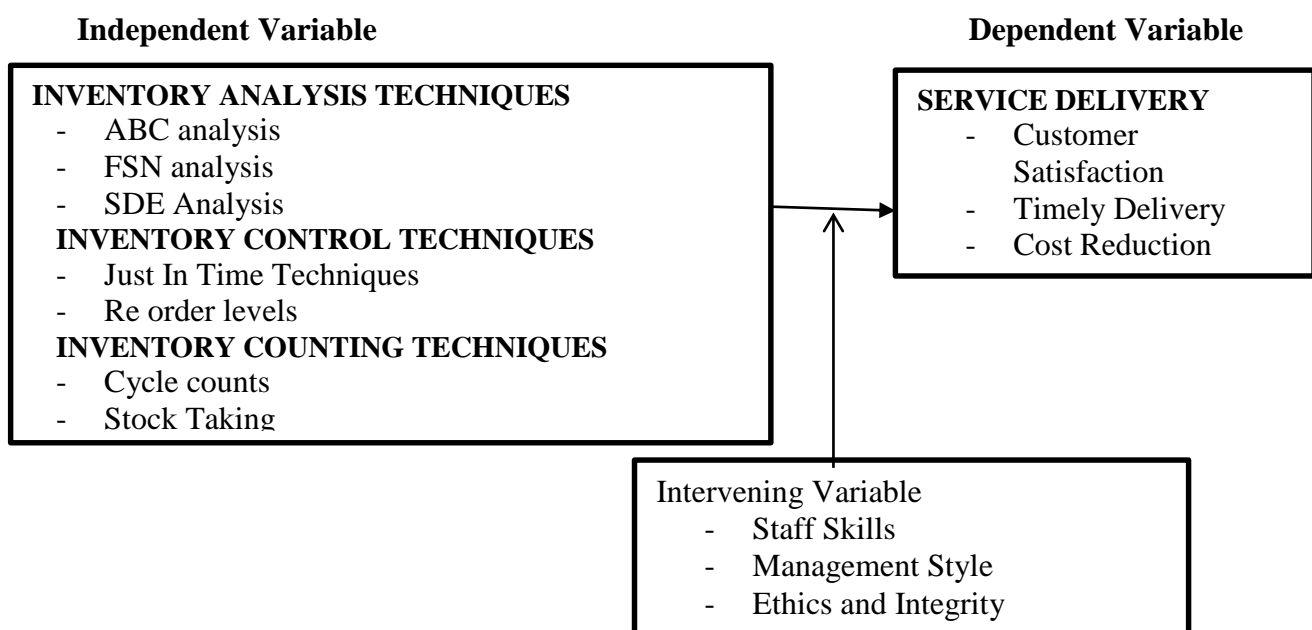
Namagembe (2010) completed studies on inventory control and purchaser pleasure in manufacturing corporations in Uganda. The goals set up the relationship between records sharing and stock management and, set up the relationship among stock control and consumer pleasure and the relation among information sharing, inventory management and satisfaction.



Her findings indicated revealed an extensive high quality dating between records sharing and consumer satisfactions. Besides the studies above, much has not been done, to assess the impact of inventory management and provision of service. In the practical sense, many of the theoretical results obtained are not easily applicable considering that most are based on assumptions that are not tested in the business setting. This increased the need for the study.

### 2.3 Conceptual frame work

The study findings were evaluated using the conceptual framework bellow. This was focused on the inventory management techniques that have an impact on service delivery.



Source: Author from the literature reviewed (2019)

### Figure 1 Conceptual framework

For this study, the conceptual framework set out in Figure 2.1 was used to assess the impact of inventory management techniques on service delivery at CAA. It is from this conceptual framework that the methodological section was made, as well as the design of instruments for data collection and analysis.

## **2.4 Inventory analysis techniques and service delivery**

The principal aim of stock evaluation strategies includes adjusting to the contradictory economies of no longer having to store too much. Hence it is important to add capital and incur costs along with warehouse, spoilage, pilfering and obsolescence. The preference to make items to be had while and where required (nice and amount sensible) will become paramount so one can preclude the cost of no longer assembly such requirement in addition to making sure powerful carrier shipping (Adeyemi., 2010)

In line with Ballou, (2007) inventory optimization is important so that it will maintain charges below manipulate in the supply chain and improve carrier shipping. There are numerous techniques of stock control classifications utilized in minimizing value of managing inventory in corporations. Those include; ABC evaluation (usually better manipulate) SDE evaluation (Scarce, tough, easy) FSN evaluation (fast, sluggish transferring and Non-shifting).

### **2.4.1 ABC Classification**

The ABC approach expresses that, “when looking into stock, an organization should rate items from A to C, putting together its evaluations with respect to the significance of the material”, to give by and large assurance against stock outs. “Splitting items in A, B and C classes are relatively arbitrary. This grouping best represents a rather trustworthy interpretation of the Pareto precept. In exercise, intake extent is not the best yardstick that weighs the importance of an item. Margin of go back and the impact of a stock-out on the business must also impact the inventory method. The evaluation organized ought to be checked frequently (weekly or monthly) relying on the extent of operations of the company”(Balagi 2014)

A-objects are products in which yearly intake cost is better than no other. The upper 70-80% of the annual expenditure price of the agency usually bills for handiest 10-20% of general inventory objects (Dhoka, 2013). A-classification should have strict inventory management, extra protected stock yard regions and higher intake projections to fulfil customer demands. Reorders have to be periodic, reordered weekly or even daily. Preventing A-classifications from stock-outs is a prime concern.

“C-gadgets are, at the opposite, objects with the bottom consumption value. The lower 5% of the once a year intake fee commonly money owed for 50% of general stock objects. Reordering C-objects is made less frequently”(Ravinder & Misra, 2014). A generally inventory policy for C-objects consist of having only 1unit handy, and of reordering handiest when a real purchase is made. This approach leads to inventory-out scenario after each purchase which can be an acceptable situation, since the C-classification gift both low demand and higher danger of inflated stock prices. For C- objects, the issue isn't always a lot how many units will we keep but as an alternative do we even hold this object in shop to make certain effective provider shipping?

“B-items are the interclass gadgets, with a medium intake price. That is 15-25% of annual consumption price typically money owed for 30% of general inventory gadgets. B-items gain from an intermediate fame among A and C. A crucial aspect of class B is the tracking of capability evolution toward magnificence A or, in the contrary, toward the elegance C”

### **2.4.3 SDE Classification**

The SDE check depends on the availability of items and is particularly beneficial when it comes to supply shortage. S applies to frightening things in this investigation, for the maximum part imported, and those which might be difficult to locate. D alludes to hard items which can be accessed locally but are demanding items to gain. E refers to items that are easy

to collect and which might be to be had inside the nearby markets. The SDE order, in light of issues looked in obtainment is crucial to the lead time examination and in choosing acquiring procedures (KUMAR, 2014)

#### **2.4.4 FSN Classification**

“FSN stands for fast moving slow moving and non-moving. Here, order depends on the example of issues from stores and is valuable in controlling out of date quality” (Ghewari, 2020). To do a FSN examination, the date of receipt or the last date of issue, whichever is later, is taken to decide the quantity of months, which have slipped by since the last exchange. The items are typically assembled in times of a year

Imelda and Rhessy (2012) Conducted an investigation on ‘ABC-VED Analysis and Economic Order Interval (EOI)- Multiple Items for Medicines Inventory Control’ in some administration Hospitals. The investigative technique depended on a framework that coupled ABC examination (in light of cost criteria) and VED investigation (in view of criticality) was figured for prioritization. At that point, Economic Order Interval (EOI)- various items model was proposed to decide 'when' and 'how much' the request ought to be set. It was seen that 40 prescriptions (11.90%) were arranged into class 1(AV+BV+CV+AE+AD) for stringent control. Utilization of EOI-various items additionally permit successful control of yearly absolute use.

## 2.5 Inventory Control Techniques and Service Delivery

### 2.5.1 Just in Time (JIT)

JIT is as a stock control system which reduces stock levels through free market planning practices (Onyango, 2016) It seeks to decrease stock rates by providing the basis for use in the short term. Items in an ideal world should arrive when an organization needs them without opposition in advance or in late transports. The system is often defined in the nick of time. He reiterates that the system is a logic of stock control, the point of which is to keep sufficiently the initial material in an appropriate time at the proper place to precisely measure the right item.

### 2.5.2 Re –Order levels

Reorder degree or reorder point is the inventory stage at which a agency could place a brand new order or begin a new manufacturing run. Re order degree depends on a agency's work order lead-time and its demand during that point and whether the organization continues protection stock (KUMAR, 2014)

Identifying the perfect reorder level is essential. If an enterprise places a brand new order too quickly, it can get hold of the ordered unit earlier than predicted and it might ought to endure additional carrying costs inside the shape of warehousing rents, opportunity fee and others however, If the corporation places an order too late, it might bring about inventory out charges, like lost income.

Its formula is **Reorder level**=Average Demand x Lead Time + Safety Stock if company maintains it.

The common terms used in the reorder of items are Lead time, which means period of time between ordering and replenishing the products. “The minimum stock is the inventory

allowance for material demand over the lead time; this is the amount to which the inventory is prevented from dropping. It is an amount that is measured as the highest optimal inventory to be maintained and is an indication to control whether the inventory has risen excessively”(Mitra, 2015). The above levels help to get items at the right time. If products are in stock all the time, it helps end users to have items when needed all the time which leads efficiency of work.

## **2.6 Inventory counting system techniques and service delivery**

Deveshwar & Modi, (2013) opine that all firms must know the stock on hand and evaluate stock levels. Counting stock is important because it is the only way to know the nature of stock, quantity, condition of stock. It can be done by checking the quantity of receipt and by checking the number of issues by the receiver.

The inventory counting techniques included stocktaking and cycle counting. ‘Stocktaking is the physical verification of the quantities and condition of items held in an inventory which requires the physical check of the state of the counted items’(Shajema, 2018). On the other hand, service delivery is an enterprise factor that defines the interaction among clients and companies.

As indicated by (Brooks, 2008), cycle inspection involves an evaluation process of stock items based on the ABC inspection classification of stock products. The stock cycle tallying includes; tally the stock items, check of the records, and documentation of the mistakes, following the reasons for the errors and taking therapeutic activities. Systems received in cycle checking are in this way subject to the class the stock thing falls. Items of class A are tallied once per month and items of class B are reviewed four times a year, while items of class C are categorized twice annually.

An organization can embrace various stock cycle tallying procedures dependent on their needs and stock sorts. “Such stock cycle tallying methodologies incorporate arbitrary example cycle checking directed haphazardly on the stock items, ABC stock checking cycles dependent on stratified groups of inventory depending on the size and inventory costs and area-based cycle checking where records tally has no circumspection without hardly lifting a finger of checking tally has no circumspection without hardly lifting a finger of checking”, (Piasecki 2015). The forward stock cycle checking is opportunity based stock cycle tallying which depends on circumstance expenses related with stock. The fifth framework is the exchange put together stock cycle checking based with respect to the stock related exchanges as they are recorded in the stores. Different procedures incorporate the procedure control cycle checking, area put together stock cycle tallying based with respect to various areas posting of stock items and opportunity put together stock cycle checking based with respect to exceptional specific occasions in the association (Brooks, 2008)

As pointed out by Brooks (2008), cycle checking is accomplished for various reasons. This involves the need to achieve precise records on stocks, the need to maintain ideal inventory measurements in the organization, to track stocks on a consistent basis, to guarantee continuous business activities, to facilitate process improvements and the need for ideal operational expenditure. (Deveshwar & Modi, 2013), contend that to avoid failure between warehouses and the point of sale, the product coming in or leaving the warehouse should be counted. Records must be checked immediately, at least on the same day the inventory has been removed. Any captured discrepancies should be immediately reconciled.

Kauzen (2006), in his investigation on stocktaking prescribed that the storage facility activity ought to be shut while stocktaking is occurring. He additionally suggested that the development of stock ought to be ceased while stocktaking activity is in power. It is an

obligation of the inventory manager to ensure that specific instructions are issued to the employees who will be stock-takers.

Overstocking or under stocking can be daunting inventory management challenges. Executed correctly, timely and accurately, stock forecasting and ordering ensures that the inventory of a company, flows from the manufacturer to the customers at the appropriate pace and maximizes return on investment (Melanie., 2015)

Onyango (2016), Found out that regulations can affect the performance of the oil companies to meet specific customer needs or to enhance the productivity of a business itself, and that a better customer relationship needs to be established that helps reduce lead times.

## **2.7 Summary of Literature Review**

It is noted from such studies that over the last fifty years, comprehensive literature has been published on inventory theory. Nevertheless, many of the theoretical results obtained are in the practical sense not easily applied, as most of them are based on assumptions not tested in the business environment. This research offers a conceptual framework to promote the choice of the most suitable inventory management strategies in order to contribute to filling this void and inventory monitoring approaches, hence attaining increased service delivery.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

This section recounts and justifies the methods that were employed in conducting the study.

#### **3.1 Research Design**

The researcher embraced a case study research design applying qualitative as well as quantitative methods integrating descriptive and inferential statistics. The reason for adopting qualitative and quantitative designs was for interpretation and rationalization of the consequences from one technique with the results from some other.

#### **3.2 Study Population**

Orodho (2005) defines accessible population as all the items or people under consideration for which the researcher is able to get the required information. The study consisted of 110 accessible populations. This includes Directors (05), Procurement unit staff (10), Finance and accounting staff (10), Marketing and commercial services (07), Quality assurance staff (10), Managers (23), Stores unit staff (11) Engineering, planning and Development (7), and Internal audit and risk management (8), support staff (19) This population was chosen because it had a wide knowledge on the subject matter.

#### **3.3 Sampling Method**

According to (Tongco, 2007) sampling method deals with ways of selecting items to be observed for a given study. To pick from CAA employees the appropriate number of participants, sampling of non-probability and probability sampling was used. The technique permitted the researcher the freedom to choose individuals who could provide the relevant information.

### 3.4 Sample Size

Forza, C. (2002) defines a sample as a collection of some of the subset elements of the population. Dealing with the whole population is costly, time consuming, faces limited cooperation, less accurate among other limitations and therefore dealing with smaller group of population elements yields better research convenience and reliability upon generalizations that apply to the whole population was applied. For the scientifically defined analysis a sampling, given a target population of 110, a sample size of 86 was adequate from CAA (Krejcie, 1970)Table 1 Sample Size and Selection of Respondents

Category	Accessible population	Sample size	Techniques
Directors	5	4	Purposive
Procurement unit staff	10	8	Purposive
Finance and accounting staff	10	8	Purposive
Marketing and commercial services	7	5	Purposive
Quality assurance staff	10	8	Purposive
Managers	23	18	Purposive
stores unit staff	11	9	Purposive
Engineering ,planning and Dev't	7	5	Purposive
internal audit and risk management	8	6	Purposive
support staff	19	15	simple random
Total	110	86	

CAA annual report (2018) modified by the researcher

### 3.5 Sampling Techniques

As indicated in table 1, the study used both simple random sampling and purposive sampling procedures. Purposive Sampling was used to select key informants particular staff of CAA to provide in-depth views since the study was mainly qualitative (Patton, 2003). This method allowed the researcher to select a small number of staff relevant to the problem under

investigation in order to provide in depth information and knowledge of a phenomenon of interest while simple random sampling was used to select support staff of CAA. This was preferred because it was cheap and gave equal opportunities members to participate in the study.

### **3.6 Source of Data**

Both primary and secondary data was obtained. Primary data were obtained from respondents directly while secondary data were collected from CAA's relevant records like financial statements and annual audit reports among others.

Primary data source: This was done to provide details on the role of inventory management in the delivery of services to the public sector. The emphasis on the data to be obtained from this source is clearly a good basis for drawing conclusions.

Questionnaires and interview guides were distributed to respondents. The primary data is the original materials from which research work is based. It provided researcher with specific information at present time.

Secondary data source: It was used to provide additional details which formed the basis of the study and the documentary review. Reviews are published in literature, journals, the website and magazines. Secondary data involved collecting already existing data and it helps to access in accessible subject.

### **3.7 Data Collection Instruments**

The researcher used survey questionnaire and interview guide.

Questionnaire: The primary method of data collection was a questionnaire. In order to confirm the validity and usability of the questionnaire, it was pre-tested before the data collection exercise (Arnold, 2019). Using the validated questions, respondents were

interviewed with the aid of research assistants. In order to answer the demographic details of the respondents, the questionnaire was organized and subdivided with different variables. The questionnaire items were measured on a scale of five points where; 5 = Strongly Agree, 4= Agree, 3= Not Sure, 2= Disagree and 1 = strongly disagree.

**Interview guide:** A guide to the interview was used for key respondents to complement knowledge from the self-administered questionnaire (Arnold, 2019). It was achieved through face-to-face interviews so that the role of stock management in the service delivery was well understood. To obtain meaningful responses, an interview guide was used for the asking of particular questions with a variety of answers. The interviewees were intentionally selected to provide further information about the topic under study.

### **3.8 Validity and Reliability of Research Instruments**

#### **3.8.1 Validity**

Validity refers to, the credibility and believability of the research, which implies that research work is reliable enough to give conclusions confidence” (Anderson, 2020) The questionnaires and interviews were structured to achieve the research goals in order to ensure the validity of the instruments (Mugenda, 2003) . To ensure validity of the instruments the questionnaires and interviews were designed to meet the study objectives. Experts in the field of accounting were asked to analyse the contents of the questionnaires before coming up with the final instruments whose validity index was thereafter affirmed.

Using the formula below.

$$CVI = \frac{\text{Unit of items considered valid}}{\text{Number of items on the draft questionnaire and interview checklist}} = \frac{46}{50} = 0.92$$

A CVI of 0.7 or more for any instruments was viewed as suitable for the examination. All questions considered not valid were corrected or discarded per the advice of the experts.

### 3.8.2 Reliability of Research Instruments

This is the level of dependability and consistency with which the instrument measures phenomenon. When the same findings occur after the usage of an instrument to measure traits from the same respondents or researchers, that instrument is considered accurate. Reliability was ensured through inner consistency where questions inside the questionnaire that measure the identical concept were grouped together. The Cronbachs alpha package coefficient became used to decide correlation between the objects. For high-stakes settings (e.g., licensure exam) reliability ought to be more than 0.9, whereas for less critical conditions values of 0.8 or 0.7 may be suitable. The overall rule is that reliability extra than 0.8 are considered as excessive (Downing, 2004).

#### Formula

$$KR20 = [n/(n - 1)]X[1 - (\sum PQ)]$$

KR20 = estimated reliability of the full length test

n = number of items

P = proportion of people passing the item

Q = proportion of people failing the item

$$KR20 = [46/(46 - 1)]X[1 - (\sum 0.5 * 0.5)]$$

$$= 0.77$$

### 3.9 Data Collection Procedures

Prior to collecting data from the field, a letter of authorization from Uganda Martyrs University Nkozi was obtained by the researcher as approval to conduct the study. A cover letter was attached to the questionnaires and was used to explain the intention of the study to remove any suspicion or bias from the respondents. the researcher carried out a pre visit and made appointment with the respondents in the organization. Questionnaires were hand-

delivered to the respondents and interviews scheduled upon receipt of the authorization letter and permission from the organization,

### **3.10 Data analysis**

#### **3.10.1 Qualitative Data Analysis**

Qualitative data from interviews were organized into shorter meaningful statement. This analysis was aimed at collecting information on the themes in question from the responses.

#### **3.10.2 Quantitative Data Analysis**

Data was checked, edited, sorted, and coded thereafter, it was summarized using descriptive analysis and involved computation of descriptive statistics to determine the respondents' views on each of the study variable while the Pearson's correlation technique was used to determine the relationship and dependence between the variables and lastly inferential statistics involved use of correlation and regression analysis. Results were summarized and tabulated to allow analysis and interpretation.

### **3.11 Research Ethics and Consideration**

Confidentiality and privacy of respondents was respected in this study. This was done by confidentiality clauses being inserted into research instruments and adheres to corporate and research ethical procedures of both Uganda Martyrs University and Civil Aviation Authority. Since the nature of the study was based on the management of inventories in public entities, the researcher was aware of the sensitivity of the subject that assessed the personnel mandated to run such organizations. However, the researcher followed all the officially recommended guidelines and received an introductory letter from the Uganda Martyrs University Graduate School and the Civil Aviation Authority Manager Human Resources before collecting data. The researcher also sought verbal consent before contacting individual respondents.

### **3.12 Limitations to the Study**

The researcher faced difficulty in finding the CAA Management members in their offices since some of them would be gone for official duties.

Some of the respondents could hesitate to give the information about the study claiming that it was confidential. However, this problem was solved by clearly explaining to the respondents the significance of the study.

## CHAPTER FOUR

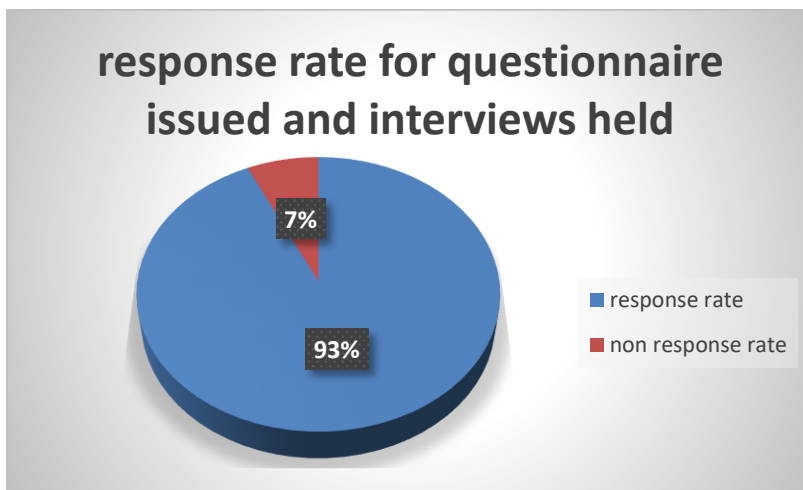
### PRESENTATION, ANALYSIS AND INTERPRETATION OF THE FINDINGS

#### 4.0 Introduction

The study conducted was about assessing the effect of Inventory Management Techniques on Service Delivery in public sectors of Uganda-while focusing on Civil Aviation Authority, Entebbe-Uganda as a Case Study. The presentations were done as per the specific objectives.

#### 4.1 Response Rate

Figure 4.1, below shows the composition of the response rate for both questionnaires issued and interviews held.



**Figure 4. 1Response rate**

Source: primary data (2019)

According to figure 4.1 above, 93% was the total response rate and 7% was the non-response rate. This implies that was very sufficient to yield valid conclusion.

#### 4.2 Background Information of the Respondents

Participates were expected to provide information on their age, gender, educational level, position held, and years of work within the organization. It decided the precision and representatives of data to the populace drawn for the study. It determined the accuracy and



representatives of information to the population drawn for the survey. The study outcomes were presented as follows:

#### 4.2.1 Age of the respondents

**Table 4. 1 Age of the respondents**

		Frequency	%
Valid	Below 25	6	7.5
	26-35	23	28.8
	36-45	31	38.8
	46-55	15	18.8
	Above 55	5	6.2
	<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: primary data (2019)

Table 4.1 indicates that 38.8% of the participants were aged between 36-45, 28.8% were aged between 26-35, 7.5% of the respondent were below 25 years of age, 18.8% were age aged between 46-55 while 6.2% were above 55 years of age. That means that the CAA has a fairly young age bracket at this point, as the age bracket tends to have up-to-date experience in inventory management techniques associated with state-of-the-art technology. Nonetheless, the results were found to be relevant for generalization as respondents with enormous experience as well as individuals who had recently obtained training in inventory management were all included in this research.

#### 4.2.2 Gender of the respondent

**Table 4. 2 Respondents by gender**

		<b>Frequency</b>	<b>%</b>
Valid	Male	46	57.5
	Female	34	42.5
	<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: primary data (2019)

Table 4.2 shows that 57.5% of the respondents were male while 42.5% were female. This means that more male are employed and compared to the female however, the study was not gender bias since both sexes had chance to participate.

#### 4.2.3 Respondents by Level of Education

**Table 4. 3 Respondents by Level of Education**

		<b>Frequency</b>	<b>%</b>
Valid	Certificate	2	2.5
	Diploma	21	26.2
	Bachelors	48	60.0
	Masters	9	11.2
	<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: primary data (2019)

Education is a determining factor in securing employment opportunities in the public sector. This aspect was also related to the findings obtained from semi-structured interviews with the workers at CAA. As shown in Table 4.3 reveals that respondents from various backgrounds participated in the research. The majority 60.0% had bachelors

followed by respondents who had diploma (26.2%), 11.2% of the respondents had masters while only 2.5% had certificates. Taking into account the fact that 60.0% of all respondents were graduates, it is evident that most participants were able to reply to questionnaires without any problems. It also implied that CAA prefers mostly workers who are bachelor graduates as compared to other educational levels.

#### 4.2.4 Position Held

**Table 4. 4 Position Held**

<b>Table 4.5 Position held</b>		<b>Frequency</b>	<b>%</b>
Valid	Assistant Officer	9	11.2
	Officer	13	16.2
	Senior Officer	20	25.0
	Principal Officer	15	18.8
	Manager	18	22.5
	Others specify	5	6.2
	<b>Total</b>	<b>80</b>	<b>100.0</b>

Primary data (2019)

Table 4.4 presents respondent's position level within the organization, 25.0% of the participants were at senior officer's level, 22.5% were managers, 18.8% were principal officers, 16.0% were officers 11.2% were assistant officers while 6.2% had others position titles. This implies majority of the participants were at seniors and managerial levels and this enabled to yield better results for the study. This level of expertise has ostensibly made it possible for them to respond more effectively to research issues.

#### 4.2.5 Years of work with CAA

**Table 4. 5 Years of work with CAA**

		<b>Frequency</b>	<b>%</b>
Valid	Below 6 yrs	12	15.0
	6-10Yrs	20	25.0
	11-15Yrs	30	37.5
	16-20Yrs	9	11.2
	Above 20 Yrs	9	11.2
	<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: primary data (2019)

Table 4.5 shows 37.5% of the respondents had spent 11-15Yrs, 25.0% had worked for 6-10Yrs, 11.2% had worked either for 16-20Yrs or 20 years and above, while only 15.0% had worked for less than years. This suggests that most participants had been employed for a long time and had actively been involved in providing trustworthy data on this research.

### 4.3 Analysis of study objectives

#### 4.3.1 Inventory analysis techniques and service delivery

The researchers decided to determine how CAA implemented inventory analysis methods to guarantee the quality of the services in the first objectives of the research. Distributions, percentages and means were used to analyse opinion and theme of interviewees data presented in the table below.

**Table 4. 6 Inventory Analysis Techniques and Service Delivery**

Statement	Disagree		Not Sure		Agreed	
	Freq	%	Freq	%	Freq	%
CAA applies ABC as stock arrangement framework to devote resources to inventory management.	7	8.8	9	11.2	64	80.0
CAA classifies inventory based on quantity and the rate of consumption	9	11.2	4	5.0	67	83.8
CAA classifies items based on annual consumption value of the item	9	11.2	4	5.0	67	83.8
CAA ensures proper classifications of items for better cost arrangement	10	12.4	4	5.0	67	83.8
CAA emphasizes entries that account for the bulk of inventory	1	1.3	2	2.5	77	96.3
CAA classifies items basing on the client's experience and perception	7	8.8	4	5.0	69	86.3
CAA applies ABC practices for ultimate reduction of safety stock	18	22.4	2	2.5	60	75.0
CAA categorize inventory depending on the cost of items	7	8.8	6	7.5	67	83.8

(Source primary data 2019)

To evaluate the results, respondents who disagreed strongly and those that disagreed fused into the 'disagreed' category while respondents who strongly agreed and those that agreed were fused into the 'agreed' category. The third category consisted of respondents who

neither agreed nor disagreed referred to as the 'undecided'. Thus, the three categories of respondents were compared from which analysis conclusions were made in relation to the three groups as described in the subsequent paragraph.

A comparison of these points indicates that the number of respondents opposing was 1.3% to 22.4%, while the number of those who did not know was between 2.5% and 11.2%, and those who answered ranged between 75.0% and 96.3%. Such measurements indicate that the number of respondents who opposed and those who were not sure is on average smaller than those who approved.

A Respondent interviewed stated that, *the ABC technique is critical in determining our efficiency by enabling effective classification of materials thus eliminating losses and damages that come with confusion due to poor classification it also makes it easier to access of materials with the storage facilities.*

Another respondent said. *Our organization has got a good inventory management practice that contributes to the operational performance of the organization. Our effectiveness of inventory analysis technique has an overall effect on the airline's performance hence improved service delivery to the customers.*

One of the respondent stated “*the CAA classification of items are based on value of the item*”.

Another respondent said; “*CAA ensures proper classifications of items for better cost arrangement, concentrates on items that make up much of the Inventory*”

#### 4.3.1.1 Correlation between Inventory Analysis Techniques and Service Delivery

A study of association was conducted to classify the relationship between the variables with the use of Pearson Correlation Coefficient. Results can be seen in table 4.7 below:

**Table 4. 7 Correlation between Inventory Analysis Techniques and Service Delivery**

		<b>INVENTORY ANALYSIS TECHNIQUES</b>	<b>SERVICE DELIVERY</b>
Inventory Analysis Techniques	Pearson Correlation	1	.998**
	Sig. (2-tailed)		.000
	N	80	80
Service Delivery	Pearson Correlation	.998**	1
	Sig. (2-tailed)	.000	
	N	80	80

\*\*Correlation is significant at the 0.01 level (2-tailed)

Table 4.7 above indicates the correlation results between inventory analysis techniques and service delivery at CAA. The results show a correlation of ( $r = .998^{**}$ ), with a ( $p$  value =  $0.000 < 0.01$ ). This indicates a positive, very strong and significant relationship with service delivery. Therefore, in view of the study findings the hypothesis which stated, inventory analysis techniques have a significant relationship with service delivery at CAA is accepted. The null hypothesis which stated, inventory analysis techniques have no significant relationship with service delivery is rejected.

### 4.3.2 Inventory Control Techniques and Service Delivery

**Table 4.8 Inventory Control Techniques and Service Delivery**

Statement	Disagree		Not Sure		Agreed	
	Freq	%	Freq	%	Freq	%
CAA orders the optimal ordering quantity for an item of stock that minimizes cost	10	12.6	20	25.0	50	62.6
CAA uses Economic Order Quantity practice to estimate how much of an item to order	12	15.1	15	18.8	53	66.3
CAA uses Economic Order Quantity practice to ensure that supply of inventory does not hit a stock out	10	12.5	6	7.5	63	78.8
Economic Order Quantity practice enables CAA to plan for its inventory replenishment on a timely basis	10	12.5	10	12.5	60	75
CAA uses Economic Order Quantity practice to determine what items fit into the Just-in-time model	11	13.8	4	5.0	65	81.3
Economic Order Quantity practice helps CAA in deciding when to order an item of stock	14	17.6	10	12.5	56	70
CAA uses Just-in-time practice to timely replenish inventory	9	11.3	10	12.5	61	76.3
CAA uses Just-in-time practice to reduce the frequency of ordering	10	12.5	10	12.5	60	75

Source: primary data (2019)

The findings in table 4.8 indicate that the percentage of those who were against ranged from 11.3% to 17.6%, while the proportion of those who were undecided was between 5.0% and 25.0%, and the %age of those who came along ranged from 62.6% to 81.3%. It can be seen



from these contrasts that the gap between those who rejected them and those who were not convinced is, on average, smaller than those who agreed.

One respondent interviewed stated: *CAA enjoys economic Order quantity as the best control technique. The model creates an optimum order that minimizes price, costs and availability of products.'*

Other respondents revealed that, *"A high standard of inventory preparation and management team has enabled to decrease the organization's material costs and improves the organization's profitability significantly."*

#### 4.3.2.1 Correlation between Inventory control techniques and service delivery

**Table 4.9 Correlation between Inventory control techniques and service delivery**

		<b>INVENTORY CONTROL TECHNIQUES</b>	<b>SERVICE DELIVERY</b>
Inventory Control Techniques	Pearson Correlation	1	.996**
	Sig. (2-tailed)		.000
	N	80	80
Service Delivery	Pearson Correlation	.996**	1
	Sig. (2-tailed)	.000	
	N	80	80

\*\*Correlation is significant at the 0.01 level (2-tailed)

Table 4.9 above presents the correlation findings of inventory control techniques and service delivery at CAA. The results show an association of ( $r = .996^{**}$ ), with a ( $p \text{ value} = 0.000 <$

0.01). This implies that inventory control techniques had positive, very strong and significant relationship with service delivery.

### 4.3.3 Inventory counting techniques and service delivery

**Table 4.10 Inventory counting techniques and service delivery**

Statement	Disagree		Not Sure		Agreed	
	Freq	%	Freq	%	Freq	%
CAA ensures a timely up to date inventory database.	10	12.6	10	12.0	60	75.0
CAA prints a cycle counting chart listing the bin places to be counted and assigning the process to warehouse staff.	10	12.5	10	12.5	60	75.0
The CAA cycle counter undertakes a physical stock audit.	10	12.6	10	12.5	60	75.0
The CAA cycle counters cross references recorded items with entry on the database.	7	8.8	11	13.8	62	77.6
CAA examines and discusses all variations detected by cycle numbering with the warehouse manager and decides whether a pattern of errors will need further intervention.	13	16.3	7	8.8	60	75.0
CAA has alternative methods of preparing, staffing, or whatever else is expected to dispose of the errors.	25	31.3	10	12.5	47	58.8
To eliminate the error found in a cycle counter, CAA modifies the inventory record database.	11	13.8	9	11.3	60	75.0
CAA, audits the inventory, calculates the inventory accuracy %age, and post the results to concern departments	3	3.8	6	7.5	71	88.8

Question items adapted from: (Accounting Tools, 2020) Source: primary data (2019)

The outcome from the analysis presented in Table 4.10, clearly indicated that the proportion of respondents who were against ranged from 3.8% to 31.3%, with the proportion of those who were undecided ranging from 7.5% to 13.8% and the proportion of those who agreed

ranged from 58.8% to 88.8%. In those contrasts, the number of respondents who disagreed and those who were not sure was on average smaller than those who agreed.

A respondent interviewed stated that, *“We use the inventory cycle counting system for our inventory management, but inefficient staffing is our major challenge, there is underestimating counts and poor motivation among stock counting staff. He also added that, stocks counting are a tedious and boring exercise that demands for employees' proper motivation to ensure its success”*.

Another respondent said *“our good inventory counting system has helped to raise the level of service output of the organization. However, the absence of successful warehousing plans, dispatch of inappropriate items to the clients and absence of official papers for products purchased remains our big challenge”*

One of the respondent said *“our management positively perceives the use of EOQ as a way of improving inventory management to reduce stock outs”*

One respondent said *“our inventory audit team evaluates the organisation targets and posts results to the media and this has enabled to increase transparency and customer satisfaction about the organisation operations.*

Another respondent interviewed said *“the organisation has Data Entrant who complies inventory transaction into the organisation inventory database to ensure full documentation”*.

### 4.3.3.1 Correlation Inventory counting techniques and service delivery

**Table 4.11 Correlation Inventory counting techniques and service delivery**

#### Correlations

		Inventory Counting Techniques	Service Delivery
Inventory Counting Techniques	Pearson Correlation	1	.995**
	Sig. (2-tailed)		.000
	N	80	80
Service Delivery	Pearson Correlation	.995**	1
	Sig. (2-tailed)	.000	
	N	80	80

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: primary data (2019)

Table 4.11 above shows correlation results between inventory counting techniques and service delivery at CAA. The results show a correlation of ( $r = .995^{**}$ ), with a ( $p \text{ value} = 0.000 < 0.01$ ). This implies that inventory counting techniques have a positive, strong and significant relationship with service delivery. Based on the study results, the hypothesis which stated, inventory counting techniques has a significant relationship with service delivery at CAA.

#### 4.3.4 Inventory management techniques and service delivery

**Table 4.12 Inventory management techniques and service delivery**

Statement	Disagree		Not Sure		Agreed	
	Freq	%	Freq	%	Freq	%
Service delivery management is given importance during inventory management in CAA.	5	6.3	5	6.3	70	87.6
Service delivered by stores staff in CAA comprehensively addresses the needs of the staff	14	17.5	10	12.5	56	70.1
Value for money has been realized from inventory in CAA.	6	7.5	8	10.0	66	82.5
The store staff has delivered reliable services to the public in CAA.	16	20.1	3	3.8	61	76.3
Management activities in CAA have generally improved service delivery.	7	8.8	8	10.0	65	81.3
Adequate provision is made for obsolete and inactive items in inventories.	7	8.8	6	7.5	67	83.8
There has been increased customer satisfaction of good inventory management techniques	4	5.0	1	1.3	75	93.8
There has been cost reduction in inventory management by CAA	14	17.5	2	2.5	64	80.0

Source: primary data (2019)

The outcome of the analysis in table 4.12 demonstrates that the number of respondents who differed ranged from 5.0% to 17.5%, while the level of the individuals who were undecided went from 1.3% to 12.5%, and the level of those that agreed ran from 70.1 % to 93.8 %. It can be understood from these contrasts that number of individuals who differed and those who were undecided, was on average less than the individuals who agreed.

One of the procurement officers stated that, *“the implementation of inventory management techniques at CAA requires all stakeholders' involvement. Stores staffs have always delivered reliable services to the users”*.

*The implementation of inventory management practice has directly improved the organization's competitiveness in providing better quality products to the clients.*

Another respondent said that, *there has been increased customer satisfaction of good inventory management techniques.*

#### 4.4 Model summary of inventory management techniques on service delivery

**Table 4.13 Model summary of inventory management techniques on service delivery**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.999 <sup>a</sup>	.997	.996	.06345

a. Predictors: (Constant), Inventory Counting Techniques, Inventory Analysis Techniques, Inventory Control Techniques

Source: primary data (2019)

Table 4.13 indicates R square is .997, with an adjusted R square value of .996. It can therefore be inferred that 99.6% of the variations in service delivery can be accounted for by inventory analysis techniques, inventory control techniques, and inventory counting techniques while maintaining other factors intact.



#### 4.4.1 Correlation coefficients of Inventory management techniques on service delivery

**Table 4.14 Correlation coefficients of Inventory management techniques on service delivery**

#### Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.000	.007		.048	.962
	Inventory analysis techniques	.986	.082	.988	12.061	.000
	Inventory control techniques	.476	.087	.460	5.495	.000
	Inventory counting techniques	.468	.106	.450	4.421	.000

Source: primary data (2019)

From the Table 4.14 above, the standardized coefficient of inventory analysis techniques implies that an improvement in the inventory analysis techniques would on average lead to .988 increases in service delivery keeping other factors constant. The standardized coefficient of inventory control implies that an improvement in inventory control techniques would on average lead to Beta .460 increases in service delivery keeping other factors constant while the standardized coefficient of inventory counting techniques implied that an improvement in inventory counting techniques would on average lead to Beta value of .450 increase in service delivery keeping other factors constant. A big absolute t-value and small p-value

suggests that a predictor variable has a large impact on service delivery. Table 4.14 above indicates that inventory analysis technique ( $t = 12.061$ ) has the largest predictive value while inventory control technique ( $t= 5.495$ ) and inventory counting technique ( $t=4.421$ ) also made contributions.

## **CHAPTER FIVE**

### **SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATION**

#### **5.0 Introduction**

This chapter presents discussion of the study findings, conclusion, and recommendations of the study findings

#### **5.1 Summary of the Study Findings**

The study findings were summarized as per specific objectives

##### **5.1.1 Inventory analysis techniques and service delivery**

The researcher was keen on establishing the effect of inventory analysis techniques on service delivery. Findings were summarized and we can deduct from the analysis that ABC method is critical in determining the efficiency because it enables effective classification of materials thus eliminating losses and damages that come with confusion due to poor classification at CAA.

##### **5.1.2 Inventory control analysis and service delivery**

The findings revealed that the CAA values EOQ as the best control technique. The organisation uses the model to determine the optimal order which minimizes cost, maximizes quality and availability of products. The findings from also indicated that the effective inventory preparation and management by CAA inventory management team has enabled to decrease the overall cost of items and thus facilitated organisation to offer services at a minimal cost.

##### **5.1.3 Inventory counting techniques and service delivery**

The outcomes from this research objective confirmed that inventory cycle counting is used by CAA in inventory management. However, organisation's problems while using this technique

include inadequate staffing, which typically results from underestimation of counts and low morale among workers involved in stock counting.

## **5.2 Discussion of findings**

### **5.2.1 Inventory analysis techniques and service delivery**

The study outcomes have demonstrated inventory analysis techniques affects service delivery. This because the outcome indicated that improving inventory analysis techniques help to improve the service delivery and that when the inventory analysis techniques are not well managed the service quality is bad. This is in agreement with (Garnaut, 2008) that negative strategic stock management schemes contribute to higher production costs resulting in a decline of gross operating profit margin for the manufacturing companies.

It was revealed that CAA uses “ABC as an inventory classification system to assign resources in inventory management, it was also revealed that CAA “classifies inventory based on quantity and the rate of consumption”, the findings indicated the organization’s classification of items are based on value of the item. The findings concur with (John, 2015) that stock objects must be indexed in the decreasing order of the unit price and it is up to the control to set limits for three classes.

The study showed that the ABC technique is critical in determining CAA’s efficiency by enabling effective classification of materials thus eliminating losses and damages that come with confusion due to poor classification it also makes it easier to access of materials with the storage facilities. This is in conformity with (Mahagaonkar, 2017), where high value items are more tightly monitored than low value items according to ABC inventory control strategy where the emphasis is placed on cash-flows, sales volume or profitability.

### **5.2.2 Inventory control techniques and service delivery**

The study results indicated that inventory control techniques affects service delivery. This was because having effective inventory control techniques at CAA helped to raise the level of service output of the organization than when the inventory control techniques were ineffective. The study outcome was in conformity with (Waters, 2014) who asserts that poor inventory management control will cause unnecessary loss. This may be the result of one of or a combination of company stock outs, absence of successful warehousing plans, dispatch of inappropriate items to the clients and absence of official papers for products purchased.

It was revealed that CAA uses 'Economic Order Quantity practice to guarantee timely supply of inventory and this has ensured optimal ordering of stock items to reduce expenditure. The EOQ model and Just in time has allowed CAA to prepare for sufficient inventory replenishment. The findings indicated that management positively perceives the use of EOQ as a way of improving inventory management alongside safety stock being in place to reduce stock outs, this is consistent with literature reviewed encouraging the use of EOQ (Mahoro, 2013). assert that the absence of proper records, failure to do monthly stock taking and inability to do proper estimation of quantities arose as a cause for mismanagement.

The study findings showed that CAA benefits from economic Order quantity as the most appropriate regulatory measure and this is due to how the system is able to evaluate the optimum order that minimizes efficiency, costs and product availability at CAA. These results support Oballa et al (2015) argument that inventory records accuracy is positively influenced by investment in inventory control practices which ultimately enhances organizational performance. The results further enunciated Chase et al . (2009) argument that the inventory levels are kept low by the just-in-time inventory system by providing for specific customer orders.

### **5.2.3 Inventory Counting Techniques and Service Delivery**

The findings showed that inventory counting techniques affects service delivery. This is because the use inventory counting techniques at CAA has enabled to translate into improved service delivery at the organisation.

The findings showed that CAA completes data entry inventory transaction into its system of the inventory database to ensure full documentation. CAA management team further prints a counting chart detailing the bin locations to be counted and allocates to the warehouse employees. It was further revealed that the organization also audits the inventory, calculates the inventory accuracy percentage, then posts results to the media and gives the warehouse staff incentives when they achieve predefined targets.

The above findings are compatible with Onyango, (2016) argument that cycle counting techniques such as opportunities-based counting, process based counting and location-based counting of inventory times would likely enhance monitoring and update stock records to increase accuracy of inventory data.

### **5.2.4 Inventory management techniques and service delivery**

The outcome of the study indicated that the enhancement of inventory management techniques boosts the provision service quality at CAA. The findings are in agreement with Eckert (2007) that the satisfaction derived by the customer is as a result of better management of inventory. Customers are satisfied when the arrival of their orders is timely, (Thogori M. & Gathenya, Jane, 2014).

The study findings revealed that the implementation of inventory management techniques have directly improved the organization's competitiveness in providing better quality products to the clients. This finding is consistent with a study conducted in Kenya by Naliaka

and Namusonge (2015) who identified that inventory management affects competitive advantage of manufacturing firms.

It was shown that the implementation of inventory management techniques at CAA was enriched by the contribution of stakeholders at different all levels. The senior executives drawn have up extra incentives to increase employees and suppliers to consider sustainable inventory management techniques to enhance service delivery.

This finding was in conformity with (Marquez, 2006) that the current practices in inventory management involves participation in the setting up and tracking of different stock levels, Preparation of correct inventory budgets, implementing appropriate procurement policies, and out-sourcing inventory management staff.

### **5.3 Conclusions of the Study Findings**

#### **5.3.1 Inventory analysis techniques and service delivery**

In relation to inventory analysis techniques and service delivery, the results indicated that inventory analysis techniques have a remarkable impact service delivery. The use of ABC technique has been critical to the operational performance of the organization hence improved service delivery to the customers.

#### **5.3.2 Inventory control techniques and service delivery**

Based on the study it was inferred that CAA has endeavoured to optimize supply chain efficiency, lowered operating costs, and meet customer service targets with the use of EOQ.

#### **5.3.3 Inventory counting techniques and service delivery**

Based on this objective, CAA carries out stock taking and cycle counting to ensure improved services to the clients however, it was concluded that the process of stock counting at CAA was tedious and boring exercise that demands for employees' proper motivation to ensure its success.

## **5.4 Recommendation of study findings**

The researcher makes the following recommendations for CAA to appropriately benefit from the use of inventory management practices.

### **5.4.1 Inventory analysis techniques and service delivery**

CAA should embrace the ABC model in principle and develop an appropriate inventory strategy that will provide the output with the best possible quality of service while reducing investment costs.

### **5.4.2 Inventory control techniques and service delivery**

Management of CAA should embrace both qualitative and quantitative aspects in their decision making to decrease the organization's material costs by integration of different inventory management control techniques.

CAA should empower the inventory management team to focus on professionalism in its operations including the timely inventory activities, stock counts, ensuring appropriate inventory procedures to attain its objectives as a division.

### **5.4.3 Inventory counting techniques and service delivery**

Based on this objective, the researcher recommended CAA to employ more staff to ease the process of stocking counting.

The study also recommends that there should be motivation to staff through training to enable the staff acquire more skills related to inventory management.

The study strongly recommends increasing the quality of inventory records by program based inventory tracking team to ease the current system of counting.



### **5.5 Recommended Areas for Further Researcher**

Since this study explored the inventory management techniques and service delivery of CAA it recommends that; other studies should be executed in different sectors of the Ugandan economy for comparability purposes and to permit for rationalizations of results on the inventory management in Uganda.

The study sought to explore the inventory management techniques and service delivery at CAA. The study recommends that an in-depth study should be accrued out on constituents motivating adoption of inventory management practices in service organisations of Uganda.

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## APPENDICES

### APPENDIX I: QUESTIONNAIRE

**Dear Respondent,**

I am **Nalubowa Ruth**, a Master's student of Business Administration at Uganda Martyr's University Nkozi. I am conducting a research on "Inventory management techniques and service delivery at Civil Aviation Authority, Entebbe Airport. As a selected participant, I hereby request you to respond to the questions in this study. The information got from you will be kept confidential and will be used strictly for academic purposes.

Thank you so much for your cooperation.

#### **Section A: Respondent's Background Information**

Please mark the applicable box with a tick

##### **1. Age (Years)**

Below 25	26-35	36-45	46-55	Above 55

##### **2 Gender of Respondents**

Female

Male

##### **3 Level of Education**

Master	Bachelors	Diploma	Certificate	Others (Specify)

**4. Position held**

Assistant Officer	Officer	Senior Officer	Principal Officer	Manager

**5. Your period of work with CAA (Years)**

Below 6 yrs	6-10Yrs	11-15Yrs	16-20Yrs	Above 20 Yrs

**For sections B and C use the scale /ranking below to tick in the box that corresponds with number that best indicates your opinion on the statement or question.5**

<b>Scale</b>	1	2	3	4	5
<b>Opinion</b>	Strongly Disagree	Disagree	Neutral (Neither agree nor disagree)	Agree	Strongly Agree

**SECTION B: INVENTORY ANALYSIS TECHNIQUES AND SERVICE DELIVERY**

N0	Inventory Analysis Techniques	Tick Appropriately				
		1	2	3	4	5
	<b>STATEMENT</b>					
1	CAA classifies inventory based on how much an item costs					
2	CAA uses Activity Based Costing as an inventory classification system to allocate time and money in inventory management					
3	CAA classifies inventory based on quantity and the rate of consumption					
4	CAA classifies items based on annual consumption value of the item					

5	CAA ensures proper classifications of items for better cost arrangement					
6	CAA focuses on the items that account for the majority of inventory					
7	CAA classifies items basing on the client's experience and perception					
8	CAA uses Activity Based Costing practice for ultimate reduction of safety stock					



**SECTION C: INVENTORY CONTROL TECHNIQUES AND SERVICE DELIVERY**

N0	Inventory Control Techniques	Tick Appropriately				
		1	2	3	4	5
	<b>STATEMENT</b>					
1	CAA orders the optimal ordering quantity that minimizes cost					
2	CAA uses Economic Order Quantity practice to estimate how much of an item to order					
3	CAA uses Economic Order Quantity practice to ensure that supply of inventory does not hit a stock out					
4	Economic Order Quantity practice enables CAA to plan for its inventory replenishment on a timely basis					
5	CAA uses Economic Order Quantity practice to determine what items fit into the Just-in-time model					
6	Economic Order Quantity practice helps CAA in deciding when to order an item of stock					
7	CAA uses Just-in-time practice to timely replenish inventory					
8	CAA uses Just-in-time practice to reduce the frequency of ordering					

**SECTION D: INVENTORY COUNTING TECHNIQUES AND SERVICE DELIVERY**

NO	Inventory Counting Techniques and Service Delivery	Tick Appropriately				
		1	2	3	4	5
	<b>STATEMENT</b>					
1	CAA completes data entry on all inventory transactions, so the inventory database is fully updated.					
2	CAA prints a cycle counting report, which states the in locations that are to be counted, and assign it to the warehouse staff.					
3	The cycle counters in CAA compare the locations, descriptions, and quantities stated on the report to what they see on the shelf.					
4	The CAA cycle counters trace what they see on the shelf back to the report, in case some items have not been recorded within the database at all.					
5	CAA investigates all differences found after cycle count and discusses them with the warehouse manager, and determines whether there is a pattern of errors that may require further action.					
6	CAA has alternative procedures, training, staffing, or whatever else is needed to eliminate the error.					
7	CAA adjusts the inventory record database to remove the error found by the cycle counter.					
8	CAA, audits the inventory, calculates the inventory accuracy percentage, and post the results to concern department.					

**SECTION C: SERVICE DELIVERY IN CAA**

NO	Service Delivery in Statement	Tick appropriately				
		1	2	3	4	5
1	Service delivery management is given importance during inventory management in CAA.					
2	Service delivered by stores staff in CAA comprehensively addresses the needs of the staff					
3	Value for money has been realized from inventory in CAA.					
4	Stores staff have delivered reliable services to the public in CAA.					
5	Management activities in CAA have generally improved service delivery.					
7	There has been increased customer satisfaction of good inventory management techniques					
8	There has been cost reduction in inventory management by CAA					

## **APPENDIX 11: INTERVIEW GUIDE**

**Dear Respondent,**

I am **Nalubowa Ruth**, a Master's student of Business Administration at Uganda Martyr's University Nkozi. I am conducting a research on "Inventory management techniques and service delivery: A Case study of Civil Aviation Authority, Entebbe Airport. You have been selected to participate and hereby requested respond to the questions in this study. The information got from you will be kept confidential and will be used strictly for academic purposes.

- 1) What is your position at Civil Aviation Authority?
- 2) What inventory analysis technique is adopted by CAA?
- 3). How does inventory analysis techniques adopted by CAA affect service delivery?
- 4) What are the methods used by CAA to issue stock?
- 5) What are your inventory management controls techniques?
- 6) How does your inventory management controls techniques impacted service delivery?
- 7) What inventory counting techniques is used by CAA?
- 8). How does your inventory counting techniques influenced service delivery?
- 9). what is the process followed to ensure that all items ordered are properly received?

**Thank you so much for your cooperation.**