Relevance of Inventory Accuracy from 3PL Service Provider perspective

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Abstract: **Inventory Management is very vital to the success & growth of any organisations. The study indicated that there are several factors that are influencing the effectiveness of inventory management. The purpose of this research is to identify the key problems in inventory management in any organisation, especially from 3PL service provider perspective, covering managing Automobile components, consumer & Retail products. This paper is aimed at developing and testing methodology to evaluate the most appropriate process within the outsourced Process of Inventory Management.**

Effectiveness of inventory management is vital in every 3PL organisation to be more competitive. The entire profitability of an 3PL organisation is tied to the accuracy of customer inventory which has direct relationship with the service level to the customer.

In completing this research, the population of this study is about 80 Managers & Senior Executives randomly selected from Manufacturer & 3Pl service providers. A Sample size of 61 was derived for survey and data points generated from questionnaire forms the basis.

The results have shown that the problems of inventory management faced by them were management of Stocks at 3 different levels, ie,

- **Dock to Stock (Inbound),**
- **Storage administration and**
- **Order to delivery (Outbound).**

The key areas were majority on Accounting the stocks in books, Managing the stocks, Delivery to customer orders (OTIF) and discrepancy of records. The factors, documentation/store records, planning, knowledge of employees/staff skill have shown to significantly influence the effectiveness of inventory management while the operational process have shown slightly significant influence on the inventory management in any Stores / Warehouse management. This quantitative study is important to the manufacturing as well as 3PL service providers because it provides the guidelines to the employers of warehouse personnel.

1. INTRODUCTION

Third-party logistics providers (3PLs), with continually evolve their service offerings to differentiate themselves in the market and meet rigorous customer demands. As the responsibility goes up, the risk level also increases. When the warehouse / Stores are outsourced to 3PL operator for the order management functions, several process may get affected. The stores or warehouses outsources are of raw materials, finished goods, After market spare parts, Assembly plant components, Consumables, etc. But whatever may be the scope of operations, customer wants their inventory to be intact and the Order management to be handled efficiently.   But every area within the organisation have different attitude towards inventory management.

Now majority of the Manufacturers or Distributors started outsourcing the warehousing operations with different relations. Own-account, dedicated outsources and public outsourced are compared on operational aspects, performance and the future expansions. Every manufacturer becomes more competitive when they can focus on their core business. Efficiencies gained from outsourcing inventory management allow a company to:

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- Maintain focus on core competencies

- Deepen competitive advantages

- Enhance marketplace differentiation

- Avoid outlying, resource-intensive tasks

- Reduce logistics and carrying costs

3PL provider are charged with managing the integrity of perhaps the client's valuable asset, their inventory. This is something they cannot take lightly. They understand poor inventory integrity can lead to missed sales and shrinkage for clients as well as hundreds of hours in lost time for the staff as they perform reconciliation activities and problem resolution. When maintaining inventory for multiple clients under one roof, the challenge is even more daunting.

2. INVENTORY MANAGEMENT

According to Marvin Logan (Bastian Solutions), Poor Inventory is the root cause of many operational problems and needs to be given a high priority in the distribution centre.

As per our current survey conducted, we understand the most common risk in warehousing is poor inventory management that would affect the performance of the 3PL organisation as well as their customers too. The lack of Inventory management skills or poor inventory management pulls the service provider from the competition in the industry. The Profitability of an 3PL organisation is tied to the accuracy of client's stock, which has direct impact. The 3PL should have strong process to suit the specific requirement of the customer requirements. The operations should closely monitor and manipulate their inventory system to maintain accounting process consistency for organisational profitability and competitiveness.

The Major factor affects Inventory inaccuracy are as follows:

- Poor documentation or store records.

- The processing time of manual documentation and posting records are long and there are high chances to misplace the figures or to wrongly record the information. As a result, the accurateness of the inventory record will be affected and cause discrepancy of the records.

- According to Raman, DeHoratius, & Ton, inaccurate inventory record has reduced major portion of the organization's profits.

- The common causes that lead to inaccuracy of company inventory records are the shrinkage of inventory, errors in inventory transaction and keeping the inventory in the wrong place. The shrinkage of physical inventory means the physical inventory has been stolen, damaged, expired and spoilt

3. PROBLEM STATEMENT

Problem on Inventory Inaccuracy is being discussed for a long time and in every areas of supply chain. Organisations especially 3PLs do not manage their inventory process, thereby affecting the customer service levels resulting in major debits, loses their market competitiveness. Warehouse managers are aware of the importance of their role in managing the Operations without inventory variance. In most of the 3PL warehouse operations, the inventory variance represents the total revenue of the service provider for the year, as a result of cost debited, thereby affecting the profitability of the organisations.

4. OBJECTIVE OF THIS STUDY

The broad objective of this study is to evaluate the impact of Inventory inaccuracy in different areas of 3Pl operations across verticals, while the specific objectives are:

1. To examine the level of inventory variance at different verticals in line with the Inventory liability.

2. To determine the common root cause for the inventory inaccuracy across verticals

3. To arrive the actionable points to arrest the inventory inaccuracy

4.   To assess the success post implementation of suggested action points.

Research Questions:

The following questions will guide the study

1.   What are all the level of inaccuracy across verticals – Are the challenges are common?

2.   What will be the impact/Effect of Poor Inventory Management to 3PL profitability?

3.   What are all the possible causes of Inventory Inaccuracy & How to Mitigate the variance?

Research Hypothesis:

The following research hypotheses were formulated for the study:

H1: There are common challenges in maintaining the Inventory accuracy across verticals & Can address those by better process:

H2: There is major impact on organisation profitability from potential penalties avoidance

H3: Process to improve Inventory accuracy to mitigate the variance.

5.   REVIEW OF THE RELATED LITERATURE

This paper addresses an emergent issue of inventory record inaccuracy in 3PL operations. it is necessary to maintain a stock accuracy because none of the 3PL service provider can afford to go beyond this tolerance level as it directly affect the profitability of the business and also makes customers unhappy.

(Chase and Aquilano, 1995:546). On the other hand, management is an act of organizational design. The basic functions of management is to identify for a focal business organization areas of crucial contingencies and constraints so that the business organization can make structural responses to include these constraints and contingencies within its boundary. (Onwuchekwa, 1993:193). Inventory management therefore has been defined in many ways by many authors. As expected, these authors defined inventory management based on their perception of the subject matter. Nwandu, (2006:171) defines inventory management as a form of administration control that is particularly essential in all manufacturing, wholesale and retail organizations. The essence of inventory according to Nwandu is, "to have the right goods quality and quantity, at the right place and time". The essence of inventory management for a contemporary organization. This process is needed as a part of supply chain network to protect production system against any kind of disturbance. Orga (2006:66), defines inventory control as a process of ensuring that the right quality of the relevant stock is available at the right time and in the right place. Nweze (2004:423), on his own part defines inventory control as the means of ensuring that actual flow of inventory in an organization conforms with plan. From the foregoing therefore, one infers that inventory management is the act of ensuring that balanced items of stock are maintained at the right quantity, quality, place and time in an organization, to ensure organizational business continuum. Types of Inventory Ile (2002:371), opines that inventory is classified into three types

6.   REPRESENTATION

A total of 80 industry practitioners were selected for this study.

Respondents		
3PL Managers	3PL Users (Customers)	Warehousing Experts*
35%	44%	21%
* Warehousing Eperts - Senior Executives & practitioners		

Industry Representation		
Automobile		
After Market	18	23%
In-Plant Operations	16	20%
Others		
Consumer Products	16	20%
Retail Products	12	15%
FMCG	18	23%

Questionnaire was made up with 3 sections

- Section A – Asked about the participation of the 3PL service provider in the warehousing and the satisfaction levels.

- Section B – Major Issues faced & Challenges in involving 3PL. (The frequency of problems was measured by using a 5 Point Likert scale which ranks from never to often)

- Section C – Designed to identify the factors that influence the selected Key Challenge.

Services Used from 3PL by Respondents	
3PL Services	69%
Customer Service (CRM)	38%
Supply Chain Consultancy	6%
IT Services	50%
Fleet Management	38%
After Market Spares	23%
Production Line Side	20%
Order Management	80%
Labelling / Assembly / Kitting	43%
Cross Docking	13%
Warehousing	69%
Transport Planning	50%
Distribution Management	38%
Reverse Management	10%
Inventory Management	69%

Users expectations from 3PL	
Warehouse Management	74%
Inventory Accuracy	80%
Process Improvement	62%
Transport Scheduling	56%
IT Interface	70%
Order Management	66%
Automation	55%

Voice of Respondents -

- 96% - We have successful relations mutually (between users & 3PL)

- 74% - 3PLs are supporting to improve our service level, but still we can improve

- 82% - Service providers are supportive in implementing innovative ways to improve the warehousing operations

- 60% - Service providers are expected to implement more automation and reduce labour intensive.

- 90% - Inventory Accuracy is highly required – Should focus on reducing gross inventory variances.

2019 – 3PL offers

The 2019 Annual 3PL Study reports that 63% of shippers are increasing their use of outsourced logistics services, compared to 61% reported last year. However, 86% of 3PL providers agreed their customers increased their use of outsourced logistics services, compared to 83% last year. The current percentage of customers outsourcing warehousing grew to 69% from 66%.

7. SCOPE OF SERVICES OF 3PL IN WAREHOUSING

Managers in Manufacturing industries are interested to increasingly outsource logistics functions to the 3PL services providers to reduce complexities, Cost & Risk of inventory. The scope of services includes warehousing - in-plant material handling, scrap disposal, **inventory management**, order entry and processing, Value added services. (product labeling, packaging, after sales support).

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Any organization involved with storage and handling of materials recognizes the importance of inventory accuracy. It is one of the most basic of warehouse performance measures and can be applied to inventory in all its forms.   inventory accuracy is a comparison of the physical count to what the system says is on hand either in total or by location.

For example, in case if the WMS shows some 100 Units or number of particular SKU – AB1234 are in the location AB020210, the inventory accuracy indicates, how frequently a picker can go to that location and find that the physical availability of that particular SKU matches the system Stock.

The formulas used for measuring the accuracy is as follows:

1.   Inventory accuracy by SKU: **(No of SKUs matching Physical with Book Stock) / Total number of SKUs * 100%**: This is a percent of accuracy, where the Number of SKUs count is determined to be percentage of correctness For Eg. Out of total SKUs of 1500, if the physical quantity of 1450 SKUs are matching with System stock, the accuracy would be 1450/1500 x 100% = 97%

2.   Inventory accuracy by Value: **The sum of Total Value of the inventory in hand / Total inventory Value as per Books.** This is a percent of accuracy, where the system inventory value is determined to be percentage of correctness. For Eg. Out of Total inventory book value worth of 500,000, if the physical value of stock availability is short by 25,000, the accuracy would be (500000 - 25,000) / 500000 = 95%. Further these variances could be Positive or Negative with regards to book stock. And overall variance could be net negative or net positive.

3.   Inventory count accuracy by location: **[1 – (the sum of the number of locations containing an error/The total number of locations counted)] * 100%.** This is a percentage of accuracy, where the system bin quantity. For example, if you count and validate the physical count of 250 locations and 247 of the locations were correct, the accuracy would be 1-(3/250) = 98.8%.

Inventory Variance tolerances:

3PLs often provide services that are customized and specialized to the needs of their customer. This is possible through long term contracts that are usual in the third-party logistics market. Mostly 3PL service levels are measured with accuracy standards agreed between customer and the 3PL companies. 3PL companies are being penalised for not meeting the standards as per the agreed terms and tolerance levels. It is not unrealistic to expect that the physical count and record will exactly match for every item; nor is it practical. An inventory record should be considered accurate if it matches the physical count within a reasonable tolerance.

To count as accurate, a record should meet three criteria: 1. The quantity on record must match the physical count within the tolerance for that item. 2. The location on record must match the physical location. 3. The item should have no outstanding transactions.

Inventory Penalty Clauses: Majority of the agreements has Inventory Standard requirements and the penalty clauses agreed between the parties.

Following are the sample clauses that are mutually agreed and incorporated in the Contract:

Automobile In-Plant / After-Market spare parts: Penalty Clauses a Glance:

1.   During the period the materials or stocks are in the custody of the service provider, in case there is any loss, damage, shortage, theft or any other discrepancy cause to the stocks, Service Provider will make good to the customer all such costs, losses and damages at net variance, if it exceeds 0.2% of the current turnover or 1% of such Gross Variance

2.   Net negative Variance exceeds 0.5% of the total inventory holding

FMCG / Retail:

1.   Gross Variance exceeds 1% (Negative + Positive Variance)

2.   Net Negative Variance Exceeds 0.5% of the total inventory holding

Consumer Products

1.   Negative – 100% - Excess is not considered as upside

2.   Net Negative – 100%

H1: What are all the level of inaccuracy across verticals – Are the challenges are common?

Inventory accuracy of selected Customers having 3PL operations from different industry sectors.

Illustration: 1

Industry Sector	Automobile - After Mark	
Warehouse Size	3,50,000	Sq Ft
No of SKUs	24000	
Inventory by Location	**Locations**	**Value in Lacs**
Total As per ERP	9847	5725.85
Matching with ERP	4592	
Excess / Short	5255	-2.46
% of Accuracy	**47%**	**99.96%**
Tolerance : Variance not to exceed - 0.5% of net negative agreed wiith customer.		

Illustration: 2

Industry Sector	Retail Operations	
Warehouse Size	50,000	Sq Ft
No of SKUs	3722	
Inventory by SKU	**SKUs**	**Value in Crs**
SKUs as per ERP	3722	1.6
Matching with ERP	3310	
Excess / Short - Gross	412	0.015
% of Accuracy *	**89%**	**0.94%**
Tolerance : 1% of Gross on Inventory Value		

Illistration 3

In-Plant Operations	Value in Crs	Variance
Value covered in this Shut Down Inventory in Crs	26	
Shortage in Value	0.95	4%
Excess in Value	1.01	
Gross Inventory Variance	1.96	
Net Excess	0.06	
Variance Level*	**0.23%**	
Tolerance : 0.5% of negative (Only) agreed wiith customer.		

All the 3 Illustrations, we find the Warehouse is so effective from the perspective of 3PL provider, as they are well within the contractual norms.

But Operational discipline is not upto the standards, as they have huge difference at SKU level and there is a huge mismatch of inventory at location / SKU level.

This is high risk for 3PLs, It shows the inventories are not anaged properly.

The accuracy of Warehouse physical inventory should match with the inventory listed in the System or ERP Stock. but realistically there's often a disparity in any large warehouses. A high rate of inaccuracy in inventories can lead to unexpected backorders, customer dissatisfaction and, ultimately, results in big impact to the 3PL service provider.

Inventory accuracy data from the Tompkins Supply Chain Consortium suggests the typical range of accuracy for organizations with inventory counting programs. Bench-Mark Inventory Accuracy Percentages

Best Performers	Medium	Average	Below Average	Least Perfomance
99.50%	99.00%	98.00%	97.60%	89.00%

Top-performing companies are capable of inventory accuracy greater than 99%, while the average company can achieve 98%. For organizations not performing at these levels, there are opportunities for improvement

Inventory accuracy?

There are two types of "accuracy" when it comes to inventory counts: Four-wall (Wall to wall) and part-level accuracy. Part-level accuracy deals with stock on hand, or the number of pieces we have in inventory. To calculate four-wall accuracy, we compare the total value of the inventory to the book value in the general ledger. This calculation can give managers a false sense of how well the company is managing the inventory.

For instance, we might have parts with similar costs that, when netted together, have a small effect on the books. To illustrate, let's say our inventory records show we have one piece of Part A with a book value of INR 500. The records also indicate that we have one piece of Part B with a book value of INR 475.

When we do an inventory cycle count, we notice that we're missing Part A, so we have a variance on the book value of INR 500 Negative. We then notice that we have an extra Part B, giving us a book value variance of INR 475 Positive.

Combine those two variances and we get a total variance of INR 20 Negative only a small percentage of the overall value. That may make the accountants & Customers happy, but in reality the inaccuracy of the on-hand stock makes our part accuracy 100 percent off on these two parts. This is always a risk to any 3Pl companies.

H2: Effect of Poor Inventory Management to 3PL Service Provider

The biggest revenue for the 3PL is that they invoice their customer for holding the customers inventory and being accountable for the stock for the tenure of the contract. The revenue includes Space, Manpower resources, IT infrastructure if any, Other related costs Plus their Service charges for managing the warehousing operations.

Generally the service charges are from 15% to 25%. It varies from different type of pricing scenarios.

Types of Pricing Models in Contract Logistics: 1. Fee-based on the percentage of Sales Turnover or volume, 2. Cost Plus model, 3. Price per Sq. Ft, 4. Transaction and Fixed Price combination, 5. Cost per transaction or unit pricing. First 2 Models are most common model prevailing in the industry.

Fee-based on the percentage of Sales Turnover or volume: Traditionally warehousing service providers who are involved mainly in Finished Goods logistics have practiced the pricing mechanism of charging Warehousing Fee as a percentage of sales billed per month. The fee can vary anywhere from 0.5 to 2% of the monthly gross sales turnover. This is mostly applicable to the Automobile spare parts operations. This is applicable to our Illustration 1 as stated above.

Referring: **Illustration 1:**

Industry Sector	Automobile - After Market
Warehouse Size	350000 Sq Ft
No of SKUs	24000
Inventory Variance in terms of Value	99.96%
Inventory Accuracy in terms of location	47%

Remuneration Structure		Impact in case Beyond Tolerance	
Average Sales per month	50 Crores INR		
Remuneration Agreed	0.70%		
Remuneration INR	3500000		
Monthly Gross Margin Expected	15%	Average inventory	70 Crs
Less : Admin / Central office Expense / Interest cost	8%	Tolerance	0.50%
		Stock Accuracy in Case	99%
Net margins Before Tax	7%	Penalty	1%
Net Margin Expected in INR / Mth	**245000**	Impact	7000000
Net Margin per annum	**2940000**	Impact to Service Provider	**-4060000**

The total Profitability of the project is eaten away and goes negative in single Inventory debit – Hence the Accuracy of stock is highly important to mitigate the losses. The efforts of entire year operation likely to be eroded in single debit.

Cost Plus model - Large size projects that are dedicated and fixed Resources setup kind of operations are normally run based on Cost Plus model. As the name suggests, the pricing mechanism involves estimating the total cost of running operations and profit as a Management Fee which is fixed as a percentage of the total cost.

This costing method works well when the project size is huge and operations include multiple transactions and value-added activities within the warehouse. A large size warehousing project calls for huge investments to create the building and infrastructure. The build may have to be built or may be hired by paying a security deposit. Infrastructure investments would include racking or shelving systems, material handling equipment including Forklifts, Reach Trucks, Dock

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levellers, etc., conveyer or any other equipment needed. IT infrastructure can include cost of hardware including servers, desktops, laptops, printers, RF equipment, etc.

Given the size of the project and the investments involved, the contract or project is awarded for three years with two extensions of one year each. This helps the 3PL to amortize the investments over the contract period.

This type of costing will have two parts:

1.   Manpower resources Salary & Wages + Management Fees: Actuals + 20%

2.   Infrastructure & Equipment Charges: Amortised / Rental Model (As far as operations are directly concerned, Manpower resources + Margins are considered for profitability workings)

Referring: Illustration 2

Industry Sector	Retail Operations
Warehouse Size	50000 Sq Ft
No of SKUs	3722
Inventory Variance in terms of Value	99.06%
Inventory Accuracy in terms of location	89%

Remuneration Structure		Impact due to Inventory In accuracy	
Total Manpower resources	40		
Average CTC per head	17500	Average inventory	1.6 Crs
Total Cost	700000	Tolerance	1%
Management Fee - 18%	140000	Stock Accuracy	97%
Less : Admin / Central office Expense / Interest cost	10%	Penalty	3%
		Impact	480000
Net Operational margins	8%		
Net Margin Expected in INR / Mth	**56000**	**Loss percentage - Margin Reduction**	**71%**
Net Margin per annum	**672000**		

Referring Illustration: 3

Industry Sector	In Plant Operations
Warehouse Size	35000 Sq Ft
Invenntory Tolerance	0.5% Only Negative
Excess Inventroy Variance in Crs	1.96
Negative Inventory Variance in Crs	0.95

Remuneration Structure		Impact due to Stock Variance	
Total Manpower resources	150		
Average CTC per head	20000		
Total Cost	3000000		
Management Fee - 20%	600000	Average inventory	26
Less : Admin / Central office Expense / Interest cost	8%	Tolerance	0.50%
		Tolerance In Value	0.13
Net Operational margins	12%	Penalty	0.82
Net Margin Expected in INR / Mth	**360000**	Impact	**-380000**
Net Margin per annum	**4320000**		

From the above illustrations, it is clearly evident that the Impact is very high even if there is a slight negative variation in inventory accuracy.

H3: Challenges in Inventory Inaccuracy – Causes

There could be a million reasons for mismanaging the inventory. This isn't an exhaustive list, but it does few of the most probable reasons why the inventory management is suffering.

The findings indicate that perfect inventory records are difficult to maintain. Considering the complexities in the operations in the warehouses, the inventory record is very likely to be incorrect. The causes of discrepancies in the records are many, and some of the commonly observed ones are discussed here:

Stock loss, Transaction error, Material Not Traceable and Wrong Identification of SKUs

Stock loss, also known as shrinkage in industry, includes all forms of loss of the products available for despatch. One common example is theft, which can be committed by both Customer side employee and 3PL employees. It also includes collusion between customers and staff and the unauthorized consumption (such as eating) of the stock by both customer and 3PL employees. Stock loss can also occur when products are unavailable for despatch by becoming out of date, damaged, or spoiled.

Transaction error occurs during while stocks are received and despatches (inbound and outbound) at the warehouse While in-warding the stocks, that must be registered into the WMS/ERP or any other IT system. There may be discrepancy between the received documents and the actual receipt, and when It goes unnoticed by the receiving clerk, the inventory record will not reflect the actual stock accurately. During any despatches, the stocks that are being despatched to be properly documented / Delivery Challan or invoiced raised only for SKU & Quantity despatched. The warehouse operations team should be more careful when it comes for identical parts.

Material Not Traceable (MNT) refers to SKU that are somewhere in the warehouse but are not available because they cannot be found. This can happen when a Picker takes a SKU from the storage location and places it at different location. It can also happen during binning stage at the warehouse. The MNT inventory will eventually be found and made ready for despatch. However, a long time may pass until this happens, and until then, the MNT SKUs are no different from Shortage as far as inventory is concerned

Wrong Identification of SKUs can occur in several different ways. May be due to wrong labels placed on the product by both supplier the receiving person unnoticed. When the bar-codes on these labels are scanned during receiving or despatches, the inventory record for wrong items will change. Wrong identification can also happen during manual inventory counts. This makes inaccuracy, seem like a huge problem is the volume of the products handled in the stores. Typical warehouse operations, being at centre point of distribution to various ends, are the key area that handles thousands of products that come in all different categories, shapes, and sizes, and tens of thousands of items may come in and go out of the store in a single day. For this reason, keeping track of the location of every item and making sure the inventory record agrees with the actual stock quantity is a daunting task.

Mitigate Inventory Challenges:

According to Quarterman Lee, there are various methods to improve accuracy include Cycle Counting, Physical Inventory, Transaction Reduction and Process Improvement. Cycle counting and the physical inventory remove errors. Process improvement and transaction reduction prevents new errors. An optimal approach to Inventory Record Accuracy uses both.

Any warehouse operations are measured by service levels, volume of transactions handled quality of transactions and most importantly inventory health maintained. Having inventory accuracy refers the way the inventory is physically kept in the right locations and document discipline maintained in all the transactions and the good level of data maintained in the system. Inventory accuracy is also connected with proper Warehouse management system, good Warehouse layout, infrastructure and the good human resources with right process, compliance and periodic audit. The key to good warehousing practice is reflected in availability of documented process covering all above warehouse functions and documented proof of the daily transactions and activities. Standard Operation Procedure (SOP) is the guide and those processes given in the SOPs are further broken down to work instructions.

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Layout:

Warehouse layout design will be made taking into account the operational process, nature of goods, volumes of transactions both inbound and outbound, storage types, in-house operations involving put away and picking sequences and process requirements including packing, kitting etc and the availability of floor space coupled with building layout design of inbound and outbound docks. The design aims to maximize space utilization, minimize MHE movement and Manpower movement. Warehouse should be organised in a way the items can be easily identified for the delivery orders and the product can be received and stored in case of inbound receipts. The stocks or SKUs are to be easily identifiable by the picker for easy picking and to avoid searching the material. It is also importance that the inbound inventories are received and stored in a systemized and well-planned manner.

Location accuracy is critical to any warehousing operations. Materials are picked based on system guided pick lists or RF enabled picking. In case the location accuracy is not correct, picker may have to waste lot of time in searching the right material and the hourly rhythm of picking cannot be maintained. Wrong material lying in the location picked may get missed out in the process and end up as wrong shipments too.

Standard Operating Procedures and Policies:

It is very important to define all the process for efficient movement and accurate inventory management. All process documentation should include procedures for handling the stocks, Binning & Picking of stocks, safety guideline and standards of maintaining data in system These procedures should include all the processes for the receipt and put away of the material, whether it is FG, Spare parts or FMCG, irrespective of the nature of product.. The documented procedures should detail how the inventory should be handled, checked, and put into storage locations. The instructions also need to include how to handle damaged inventory, rework or scrap procedure etc.

Ensure the SOPs are well explained to all the members of the warehouse, amend in case of any better solution or process suggested by the members. The processes may have to be audited to make sure each procedure documented is being followed. If non-compliance issues arise, make sure to implement a corrective action right away. And if employees seem to be deviating from the documented process (perhaps because the deviation provides a quicker way to do a task), the process should be examined to see if changes are needed to the process, and if not it should be clearly communicated that process deviations are not acceptable.

Implement Cycle count practices:

Though we have processes & Policies in place to handle inventory much better, cycle count and physical count is very much needed to maintain the inventory accuracy. **Cycle counting** is a way to audit a smaller subset of the inventory is audited in a specified location on a specified day. This happens continuously, dependent upon the amount of inventory we have in stock. **Physical counting** is a process of counting the entire inventory in a facility and correcting inaccuracies in inventory records. This is a much more invasive process that halts all production, unlike a cycle count which can be performed as a daily task.

In order to maximize the value of the audit and minimize the pain of the physical count, it is recommended to do full cycle count at least one per quarter. **Inventory Health is the report card of Every Warehouse reflecting is operational efficiency.** Cycle counts can introduce inventory errors if the cycle count process is poorly executed. Multiple locations per item, work in process, and lag in paperwork processing can each contribute to errors. This problem can be mitigated with correct cycle count procedures that specify not only the part number to be counted but also the location it should be in. Cycle counting is only effective in companies with a well-defined inventory control procedure and a high degree of inventory accuracy.

Cycle Count Best Practices:

• The higher the frequency of the cycle count, the higher will be the inventory accuracy. Cycle count is part of the normal operations

• Classify products into Groups based on the value Review classification periodically. (ABC – A – High, B- Medium, C- Low or A-70%, B-20% C-10% of the total inventory value).

- Once chosen an area/category for cycle count – ensure that we do not allow addition or modification of stock to the area during cycle counts. Focus on one area of the warehouse, allows to count efficiently even during business hours.

- Change inventory Schedules to avoid staffs and employees disturb the process and get alerted. So that shrinkages due to staff theft can be avoided.

- Ensure that, on average, count every product at least once a quarter.

- Investigate the sources of errors when they occur and take appropriate action to prevent them from recurring. In case errors are happening because of certain employees, provide them with training to prevent future inventory mistakes.

- Cycle counting should be done at the start of the day before the operations of the facility have begun in full swing.

- Cycle counting process should be well-defined and documented.

Warehouse Management System: When a 3PL service provider provides services to multiple clients, the complexity of their warehouse operations rises. Implementing a comprehensive warehouse management system grants a 3PL company organized data on warehouse stock, and an easy way to keep track of goods belonging to multiple clients. WMS solutions makes the process manageable and helps 3PL companies increase productivity and client satisfaction.

With the inclusion of comprehensive 3PL warehouse management software, it becomes much easier to track and manage inventory. Many of these solutions allow tracking SKU, batch, package, parts and serial number. Such complex inventory control systems show why a barcode system to track goods is essential. It streamlines warehousing and tracking tasks, reducing the number of manual tasks and increasing the efficiency and accuracy of operations. A report by Auburn University RFID Lab showed that inventory accuracy at the stock-keeping unit (SKU) level is about 65 percent, while an RFID can get this number up to 95 percent or even higher.Today's warehouse management systems provide many benefits to improve efficiency and excellent customer service.

Success Story

Inventory accuracy is the key to success. It is a topic to improving service levels, reducing lead times, increasing margins, improving efficiencies and improve other operational parameters. Post Analysing the challenges of inventory, as a 3PL practitioner, we have visited a console warehouse discussed all the challenges of Inventory in accuracy and process to mitigate as state in this literature. The warehouse selected has multiple customer including Engineering, FMCG, Retail & Consumer durable products. Clear handholding for couple of months and appraising the team for necessary process and controls. Layout was re-arranged, dedicated team for individual customers. Process re-designed without affecting service level and the cycle count was made compulsory. Now the results are tremendous. Though the service provider manages multiple customer in the selected warehouse, the sample results of success story is shown Below:

Sample Results – Implementation 1	Sample Results – Implementation 2

The above results are much encouraging and this also motivates the staff to work in much successful environment.

8. CONCLUSION

Yes, Inventory Variance is a pain and can be daunting, especially if the results show a significant variance. But as we see, variance does not automatically mean theft or pilferage. By using the above methods and implement process as stated above, we may uncover opportunities for improving your inventory management processes and not actually worrying the profitability of the organisation. The entire profitability of an organization is tied to the GAP in inventory figures, which has a direct relationship with the quality of the inventory records we maintain. Management does a lot to present a good organization to the customer in terms of service. Good inventory management saves the organization from poor customer relation, disappointment of seasoned customers, loss of profit. This is done by ensuring inventory accuracy, thus resulting in timely delivery of products to the customers. and distribution of required products. If inventory management is not adequately maintained, we cannot meet the aspirations of customers which is loss of revenue to the organization and result in debits.

9. RECOMMENDATIONS

Recommendations In line with the findings, the following recommendations are made:

- 3PLs should strengthen the inventory management system, to suit specific needs of their warehousing.

- Audit frequency to be properly scheduled in the warehouse and followed. Cycle count is no compromise.

- Management should closely monitor and manipulate their inventory system to maintain the despatches effectiveness.

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