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DRUG WAREHOUSE MANAGEMENT & SUPPLY CHAIN IN CENTRAL DRUG STORE

P.Madhusai, M.Tech Student, Department of Mechanical Engineering,Quality Engineering and Management, Jawaharlal Nehru Technological University Anantapur College Of Engineering, Ananthapuramu,Constituent college of Jawaharlal Nehru Technological University Anantapur,Andhra Pradesh, India
Dr.K. Kalyani Radha Assistant professor,Department of Mechanical Engineering, Jawaharlal Nehru Technological University Anantapur College Of Engineering, Ananthapuramu,Constituent college of Jawaharlal Nehru Technological University Anantapur,Andhra Pradesh,India
madhusaimech@gmail.com, radha.mech@jntua.ac.in

Abstract- Project targets This article describes e-Aushadhi, a web-primarily based program that manages the stock of medications, one-of-a-kind pharmaceuticals, sutures, and surgical elements wished via numerous district pharmacy warehouses within the nation of Andhra Pradesh. The predominant purpose of "e-Aushadhi" is to discover the wishes of various central drug stores in every district of the country so that each one important medications are constantly accessible to hospitals and sufferers at the user district drug warehouses at once. This incorporates classifying or categorization medications, codifying goods, making sure their exceptional, etc., before doling out medicines to patients, the chain's closing consumer. Planning, executing, and regulating deliver chain sports with the intention of meeting customer wishes and situations is referred to as deliver chain management. The reason of this research turned into to become aware of and determine the limitations to the usage of Supply chain management for the distribution of medicinal drugs and vaccinations.
Keywords: Supply Chain Management, Warehouse, e-Aushadhi.

INTRODUCTION

The definition of deliver chain control is the integration of essential commercial enterprise operations throughout the supply chain to offer fee for customers and stakeholders. In reality, apmisdc's deliver and call for are included thru supply chain management to create a a success enterprise version. Supply chain control is referred to as the making plans and management of all sourcing, procurement, conversion, and logistics-associated operations with the aid of the Council of Supply Chain Management Professionals. Eliminating bottlenecks, balancing drug prices with transportation prices, optimizing production go with the flow, preserving the right mix and area of factories and warehouses, car routing analysis, dynamic programming, and powerful use of capacities, inventories, and labour are some of the principle elements of supply chain optimization. For the introduction of quality practices and the ability to overcome demanding situations in a constantly changing surroundings, all shareholders must put into effect the suitable configuration and flexibility. The capability and evaluation utilized in "e-Aushadhi" to successfully manage the drug warehouse are defined on this have a look at. The following parts function the file's govt summary: The difficulty with the former traditional method of drug warehouse control systems is highlighted in Section 1. The structure and technique of "e-Aushadhi" are included in Section 2. Section four concludes the look at with all the talks on the preceding warehouse control and deliver chain strategies and their method at Central Drug House. Section 3 summaries the final results that become acquired after analyzing all of the statistics.

E-AUSHADHI AND ITS METHODOLOGY:

A web-primarily based Enterprise resource planning programme referred to as e-Aushadhi manages the stock of different medications, sutures, and surgical materials needed by means of the kingdom's Community Health Centres, Primary Health Centres, and Major Diagnostic Categories in addition to severe district pharmacy warehouses. The elements that aid in improving the central drug stores' medication warehouse management system also grow its effectiveness in dealing with large-scale scientific and health services with simplicity. Drug Location, Drug Safety , Drug Contradict ancy, Drug Dosage Indicator, Grouping and Sub Grouping, Improvement in Approval System by the layout section way of Applying Validation Both Raising end and Receiving give up and much greater have been some of the intriguing functions of this spic-and-span approach. This software has been already applied through the central drug stores Andhra Pradesh Medical (APMSIDC)

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and is used to managing drug supply flow and inventory management between numerous districts of state drug house facilities and sub-facilities. For a fuller understanding of the software program, e-Aushadhi, warehousing, and 3PL see the following paper.

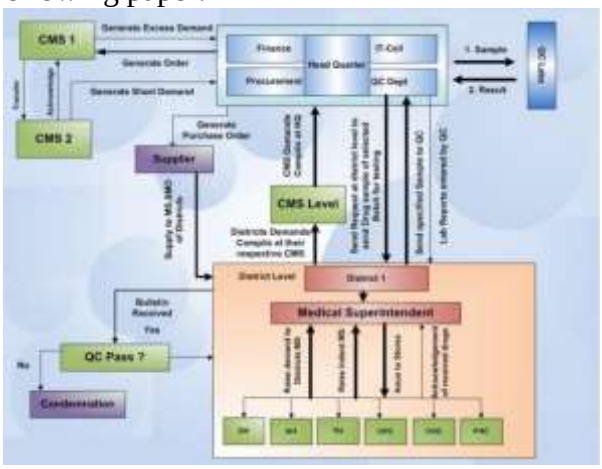

Fig 1. Process Flow of Drug Warehouse Management System

PROBLEMS IN OTHER TRADITIONAL DRUG WARE HOUSE MANAGEMENT SYSTEM :

Depending on their needs, several nationalist utilize various drug warehouse management systems. However, many of them shortage of essentials drug additives like a drug finder, a system that indicators users whilst products are approximate to run out, the reputation of first-rate buy orders, accurate inward/outward facts, QC management on pharmaceuticals, no manipulation over pills in quarantine, and so forth. The preservation of the cutting-edge inventory role at main shops and sub-shops is another vital thing absent in traditional systems.

LITERATURE REVIEW:

Himani Goel1[1] , Praveen Kumar Srivastava[2] ,Good drug supply management is an essential component of effective and for the affordable health care services globally and national level . After the first modern pharmaceuticals became widely accessible, efforts to ensure their accessibility started within a decade. Basic drug management ideas started to emerge around the middle of the 19th century in places as various as Cuba, Norway, Papua New Guinea, Peru, and Sri Lanka. Countries have accumulated a great deal of expertise in controlling the drug supply over the past 30 years. The national drug policy that is enforced by central drug stores provides a stronger framework for managing the drug supply within the state, is one of the lessons that have come out of this paper.

Mantri, Neha[1]; Joshi, Nitin K.[2]; Bhardwaj, Pankaj[3],; Manda, Balwant[4]Access and affordability to essential medicine are key to effective health care services.[1] Mortality figures across the world reflect a large burden of illness, which will be substantially reduced if low-cost pharmaceuticals are available and appropriately used.[2]According to the World Health Organization Digital Health Intervention Classification v1.0, it falls in category 3.2 “Supply Chain Management”.

OBJECTIVES:

The objective is to find out how drug location by e-Aushadhi Application. In order to process is the reduced time and cost to transport drugs from suppliers to customers as well as Hospitals by using ABC analysis and EOQ.

LAYOUT OF DRUG STORE:

Preferably, the pharmacy want to be positioned next to the pharmacy at the ground level. A vicinity with as a minimum. Chemical materials, capsules, and many others. A great store might have two entrances: one for receiving pharmaceuticals and one for doling out substances. A closed field is used to keep expensive objects. The height of the racks ought to be higher than the height for the cause that they rely upon the height of the ceiling. Since large variety of products are stored in the drug store, A specific region section code is to be determined as a manner to pick out out the product or fabric placed in hold. After reviewing their stock, an evaluation is completed.

- F S N- Fast moving, slow moving, non-moving

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- H M L- Heavy, medium, light materials

Fast-moving substances are placed close to the hassle exit whilst non-shifting devices are located some distance from the go out, according with the aforementioned magnificence. Light items flow on top and similarly heavy ones go at the lowest. Records in the mean time are stored updated utilizing a bin card gadget.

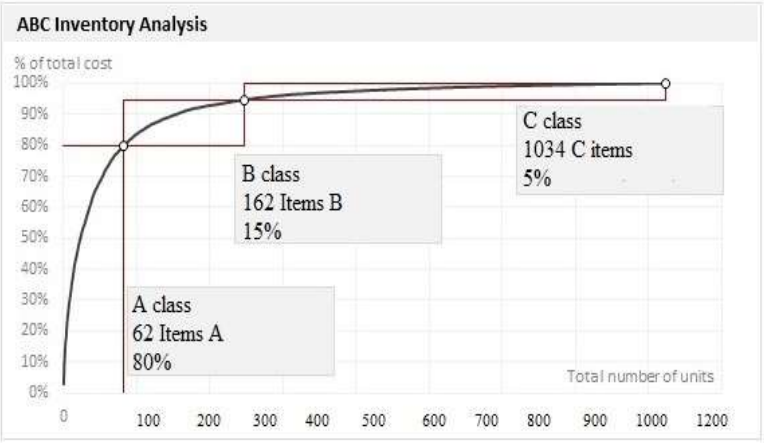
Fig 2. Layout of Drug-ware house

ABC analysis

Inventory categorization technique ABC assessment is regularly referred to as Pareto precept evaluation. It is a fundamental method within the approach to focus at the matters. As ABC evaluation the devices are categorize into 3 gadgets "A gadgets" with very tight manage and accurate data and "B objects" with tightly managed and acceptable statistics, and "C objects" with handiest controls viable and minimum data. The ABC assessment offers in a way figuring out subjects in an effort to drastically affect stock costs basic similarly to a manner for figuring out numerous stock lessons as a way to want diverse management and controls.

'A' items – 20% of the items accounts for 80% of the annual consumption value of the items
'B' items – 30% of the items accounts for 15% of the annual consumption value of the items
'C' items – 50% of the items accounts for 5% of the annual consumption value of the items
Another recommended breakdown of ABC classes:
"A" approximately 10% of items or 80% of value
"B" approximately 20% of items or 15% of value
"C" approximately 70% of items or 5% of value.

- Total number of items in the entire stock is around 1258 items, of which
- A items were 62
- B items were 162
- C items were 1034



Graph 3. ABC analysis

2) Economic order of quantity:

The optimal order amount is to reduce inventory expenses, such as holding costs, shortfall costs, and order costs is called an economic order quantity (EOQ).

- Economic order of quantity has been determined first for items A.

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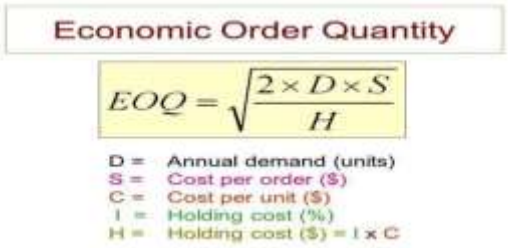
- The information collected from the hospital's medical shop has been categorized and organized in decreasing order depending on price, with high-priced things coming in first, followed by medium-priced items, and low-priced items coming in last.
- The price for the purchasing procedure is shown below:
- Purchase officer's pay / the number of purchase orders issued annually
- Cost of materials purchased is stated as follows: Salary of the shop manager/number of GRNs paid

Ordering cost is given as:

- Cost of the shopping procedure plus the fee of receiving the commodities plus other fees
- According to industry norms, protecting value is particular as 2 percentage of the item's unit rate.
- Then the ordering fee, preserving price, and demand are changed in the calculation.

Description	Quantity demand	Price per unit	Total Price	Ordering Cost	Holding Cost	EOQ	No. of orders
Paracetamol Tab500mg	2698	5597	15100706	230.67203	111.94	105	25.59
Aspirin	410	18624	7635840	230.67203	372.48	23	18.19



- Two items Tecnis one RS and Accentrix's Economic order of quantity has been identified as 105 and 23 respectively.

- This has been calculated as in the formula of EOQ, where Annual demand for Tecnis one is 2698 and Accentrix's is 410.
- Per purchase order cost + Per material received cost + Miscellaneous expenses like phone or fax etc which is approximately 100

Name of the item	Number of orders placed	Number of orders as perEOQ
Accentrix	41	18
Aspirin	77	18
Paracetamol Tab500mg	50	14
Dolo 650mg	13	10
Surgical spirit	34	8
Amoxycilin cap 500mg	49	8
Paracetamol Ing150 mg	34	8
Aztic -250 mg	34	7

- =79.1+51.56+100
- =230.66
- Hence 230.66 is the ordering cost

A loss of inventory may additionally result in a purchaser being lost or a patron placing fewer orders going forward. The Economic Order of Quantity system, wherein Demand, Ordering Cost, and Holding Cost are substituted, yields one zero five and 23 for Tecnis One and EOQs for Inj Accentrix, respectively.

The sanatorium does not presently have a continuous evaluation policy for stock management or one that is to be had. They often location orders based most effective on analyses of earlier replenishment approaches or on a judgmental minimal inventory level. The health center lacks the first-rate order amount computations to discern out the quantity of an order. The amount of every order is normally determined by using the call for from the preceding replenishment duration, but every now and then they'll add some more amount for a buffer stock of between 10 and 20 percentage of the length.

Table No.2Ordering cost with EOQ and without EOQ

dead stock has been observed in pharmacy sub store apart from others at the end of each month after consumption have been drawn for that particular month

- Consequently, the cost of the eight goods shown above in the table is INR 26,200 without EOQ, but it is reduced to INR 9,100 with EOQ ordering.

Table No. 2 list of stock in number in particular month

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At month's end, a have a look at of month-to- month facts discovered that several sub stores had a specific lifeless stock

- EOQ method can be used to determine order quantity for expensive goods. It's crucial to keep in mind that the techniques used to determine economic order quantities only offer logical principles for managing inventories. Final decisions should be made after careful thought.

Name of item	June	July	August	Sept
Paracetamol Tab500mg	266	282	341	390
Dolo 650mg	41	62	84	108
Surgical spirit	27	82	168	205

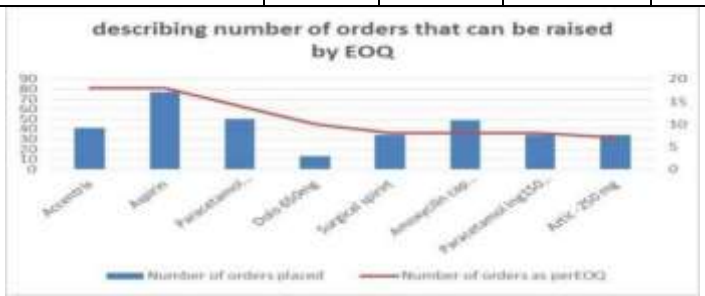

Fig.No 4:number of orders that can be raised by EOQ

Supply Chain Management:

Planning, executing, and regulating deliver chain sports as effectively as viable is the manner of supply chain control. From the factor of beginning to the factor of intake, all raw substances, inventories for work-in-progress, and finished gadgets are moved and stored as a part of the deliver chain. Importantly, additionally it is co-ordination with channels companions, which may be 1/3-celebration service companies and customers. Supplies Chain Management basically combines deliver. The events engaged in the manufacture and shipping of medication, from uncooked substances to patients, make up the drugstore deliver chain. A wide variety of statistics on subjects along with tune and trace, sensationalist, and auditing/dealing with providers may be located here.

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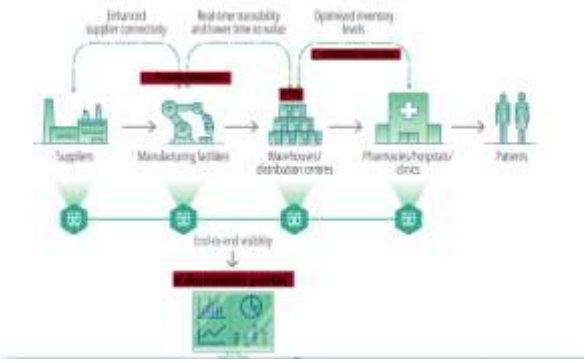

Fig 5. A Pharmaceutical supply chain network

3PL In Supply chain :

In a 3PL version, an company maintains management control but outsources transportation by vechicals and logistical operations to a provider, who may also subcontract out all or part of the execution. To improve the deliver chain, additional offerings like packing, boxing, and crating may be furnished. Whether or no longer a 3PL has its very own warehouses and automobiles is up for debate. Based on the clients' strategic needs to transport, save, and fulfil objects and resources, a 3PL can also scale and regulate offerings to satisfy those needs. When a organization supply chain grows too complicated for internal management, they turn to 3PLs. In other conditions, in addition they offer particular technological answers, like as transportation and warehouse control systems, that move past what the shipper ought to have enough money to buy on their very own.

Advantages of 3PL:

- A 3PL will offer creative solutions to trade your supply chain into a bendy, less expensive version.
- We've developed the forward-deployed version for warehousing and distribution that uses a bigger wide variety of smaller places to move merchandise toward the purchaser. This hyper-linked, decentralized paradigm gives the responsiveness required to fulfill purchasers' call for for spark off delivery.
- Through using e-Aushadhi inside the 3PL approach, we may additionally develop methods to speed transport, improve transport, and increase medicinal drug visibility.

Disadvantages of 3PL:

- Despite the 3PL version's long history of achievement, there are a few points to preserve in thoughts. The absence of direct supervision and manipulate is perhaps the maximum critical qualification.
- Since a 3PL is an outsourced service company, positive operations will arise with out your direct oversight. Extra care is wanted to ensure quality control and patron provider.
- The client will keep your firm accountable if a 3PL falls brief in their expectations, no longer the 3PL.

  Visibility and price-brought distribution techniques are crucial worries for the clinical tool area. Devices should be traced at each degree of the method to fulfil regulatory standards. A 3PL may additionally help a scientific device producer in developing mechanisms to streamline shipping from a hub to particular areas. The requirement for physical auditing is decreased due to stepped forward auditing ease and visibility into stock and reverse logistics.

CONCLUSION

The research included A mix-method were Primary data recorded from key stakeholders using qualitative interviews as well as Secondary data were collected from internet-based searches, reports, documents, and available literature.By using the ABC Analysis and Economic Order Quantity, The drug that should transport first before medicine expiry date by taking some of the medicines were found then a graph is plotted between the with EOQ and without EOQ . In order to tackle control inventory management in Central drug stores using 3PL . The supply of medicine is being transport to

different hospitals in each district but there should be small cold storage s and normal storage's near to the hospital location as it will decease the time and cost to transport.

This project me to understand the various inventory control techniques and application by using e-Aushadhi at Central drug ware house.

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