INVENTORY MANAGEMENT IN A SINGLE SPECIALITY (MATERNITY, WOMEN & CHILD CARE) HOSPITAL

Dissertation Submitted to

The IIHMR University, Jaipur

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Master of Business Administration (MBA)

in

Pharmaceutical Management

By

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Under the Supervision and Guidance of

Mr. Rahul Sharma

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31st July, 2024

To whomsoever it may concern

This is to certify that **Mr. Sounak Ghosh** was working as an **"Intern"** in the **"Pharma Department"** from **01st April, 2024 to 30th June, 2024.**

We thank him for his contribution and wish him all the very best in his future endeavors.

For

Cloudnine

(A unit of Kids Clinic India Ltd.)

Sofia Joseph
Head - HR

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **"Optimization of inventory in a single-speciality (maternity, women & child care) Hospital"** is the bona-fide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Sounak Ghosh
(Signature) 16/09/2024.

Name of Student: Sounak Ghosh

Date: 06/07/2024

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that the dissertation titled **"Inventory Management in a Single Speciality (Maternity, Women & Child Care) Hospital"** is a record of the research work undertaken by Sounak Ghosh in partial fulfillment of the requirements for the award of the degree of **MBA (Pharmaceutical Management)** from the **IIHMR University, Jaipur** under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide Mr.Rahul Sharma
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Date: 16/09/2024

Abstract

(420 words)

Effective inventory management in supply chain management is of prime importance for the proper and un-interrupted flow of the healthcare and hospital services at minimum costs within a single specialty hospital like maternity, women, and child care. The present study explores strategies that would enable optimization of inventory levels and stock holding days, along with improving the overall supply chain efficiency in such a set-up of specialized health care. The combination of VED and FSN analysis will be used in classifying inventory items respecting their criticality and frequency of use.

Goals and Objectives:

1. **Inventory Holding Days:** Shall reduce stock holding days up to maximum of 10 days without affecting patient care and quality of service**.**
2. **Classification of Inventory:** VED and FSN Analysis shall be adopted in order of priority with respect to management of inventory**.**
3. **Cost Management:** Cost Saving by having optimum stock levels and reduced holding costs
4. **Operational Efficiency:** The inventory operation should be adequate to timely make available the supplies as required.

The methodology for classification is through the following:

• **VED Analysis: Labelling** stock items as **Vital (V), Essential (E), and Desirable (D)** which means prioritization on the basis of the importance of items to the patient.

• **FSN Analysis: Labelling** the stock as **Fast-moving (F), Slow-moving (S), and Non-moving (N)** based on the rate at which it gets consumed.

Informed collection of historic data on inventory consumption, stock levels, and periodic demand trends.

Inventory Rationalization: Work out target inventory with their corresponding reorder points and safety stocks in view of VED and FSN analyses.

Install inventory management software to keep track of demand forecasting and generate automatic replenishment orders in real-time.

Results: Most items can reduce the inventory holding days substantially after implementing VED and FSN analysis and could be maintained at an optimum level so as not to hamper the continuity of the services. More importantly, cost saving for the hospital accrued through reduction of excess levels of stock that is better utilised as a resource in inventory. Inventory control with timely replenishment ensured operational efficiency that reduced stockouts of critical supplies.

Conclusion: Effective classification and prioritization of inventory items realize proper inventory optimization in a single specialty maternity, women, and child care hospital. Combining the VED analysis with FSN analysis offers an extremely robust framework for the prioritization efforts driven by the realization of cost efficiencies while continuing to sustain superior standards of patient care. This approach may work for other specialized healthcare institutions that intend to improve their inventory management practices**.**

Acknowledgement

I would like to express my sincere gratitude to the **Dr.(Prof.) Rahul Sharma**, being my mentor of **IIHMR University, Jaipur** who have contributed to the success for the **Dissertation topic**- "**Optimization of inventory in a single-speciality (maternity, women & child care) Hospital"**

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Special thanks to **Mr. Saif Kamal, Deputy Manager, Purchase** for his invaluable assistance throughout the project.

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List of Abbreviations:

Sl No.	Abbreviations	Meaning
1	**SCM**	Supply Chain Management
2	**HSCM**	Hospital Supply Chain Management
3	**TAT**	Turn-Around Time
4	**ROL**	Re-Order Label
5	**MOQ**	Minimum Order Quantity
6	**EOQ**	Economic Order Quantity
7	**S&OP**	Sales and Operations
8	**KPIs**	Key Performance Indicators
9	**RFPs**	Request for Proposal
10	**RFQs**	Request for Quotation
11	**FDA**	Food and Drugs Administration
12	**EMA**	European Medicines Agency
13	**ABC**	Always, Better, Control- Inventory Control Techniques
14	**VED**	Vital, Essential and Desirable- Inventory Control Techniques
15	**FSN**	Fast, Slow and Non-Moving- Inventory Control Techniques
16	**JIT**	Just-In Time
17	**MIS**	Management Information System
18	**HMIS**	Hospital Management Information System
19	**ERP**	Enterprise Resource Planning
20	**IP**	In-Patient Pharmacy
21	**OP**	Out-Patient Pharmacy

Chapter 1

Introduction

1.1 Aim of the Study: The **Aim** of the study is to **efficiently manage and optimize the Inventory (Drugs, Pharma and Bio-Medical Equipment Stocks) and Pharmacy in a single-speciality (Maternity, Women & Child Care) Hospital by reducing or downsizing the Inventory Stock Holding Days in the Hospital Pharmacy.** In broader terms, the study aims to efficiently manage and optimize the pharmacy, warehouse, stores and inventory in a Single Speciality-Hospital that covers both direct and indirect outcomes such as **Cost Reduction, Space Management, increase in operational efficiency of the pharmacy and ensuring compliance in the system.**

1.1.1 Objective of the Study: The following study aims to bring both the direct and indirect benefits that can be achieved by properly or efficiently managing or by optimizing the **IP and OP Pharmacy in a Hospital** through proper **Supply Chain Management Practices**. The objectives can be listed down as follows:

(i) **Cost Minimization:** Proper procurement and purchase of fast moving items and reducing purchase of very slow and almost minimizing the purchase of non-moving items can allow budget considerations and can **reduce cost involved in procurement** or in other words can lead to effective procurement.

(ii) **Reduce Expiry of Un-used stock:** To much extent, expiry of unused drugs, vaccines and can be minimized and thus **wastage can be reduced** and hence again have a direct impact on cost and budget.

(iii) **Proper Space Utilization in Pharmacy**: Generally, due to overstocking of medicines and improper procurement, space becomes a big issue in the pharmacy and dumping of medicines occur. Correct procurement and purchase practices can solve this problem and there will clear and ventilated space in the pharmacy also.

(iv) **Increase in Operational Efficiency:** Proper procurement can lead to correct stocking of drugs in shelfs and racks, helping pharmacists to manage patients or customers efficiently and this helps pharmacists to attend more time to patients.

Before entering into a detailed discussion in the article regarding the topic about the methodology, results, findings and discussions, lets understand briefly **the Supply Chain Management Process and how its application is done in the healthcare sector, typically in a Hospital setting to achieve the objectives stated above**.

The literature mentioned in the article has been taken and modified by the author from various articles, studies and real-life working experience from professionals involved in this field, and resources that are available both online (the internet sources) and offline (in form of existing books, research papers and journals, etc.)

Topics to be covered in detail in Introduction:

1.Supply Chain Management and Hospital Supply Chain Management

2. Procurement and Purchase

3. Inventory Management and Inventory Control Techniques

4.Vendor/Supplier Management

5.Rate Contracts

6.Re-Order Label (ROL), Minimum Order Quantity (MOQ)/Economic Order Quantity(EOQ)

7.Management Information System (MIS) and Enterprise Resource Planning (ERP) Systems

1.2 Supply Chain Management:

As discussed previously, **Supply Chain Management (SCM)** deals with a system of **procurement (purchasing raw materials/components), operations management, logistics and marketing channels, through which raw materials can be developed into finished products and delivered to their end customers**.

This can include the movement and storage of raw materials, work-in-process inventory, finished goods, and end to end order fulfilment from the point of origin to the point of consumption. SCM is the broad range of activities required to plan, control and execute a product's flow from materials to production to distribution in the most economical way possible.

Thus it can be summarized that SCM is the broad range of activities required to plan, control and execute a product's flow from materials to production to distribution in the most economical way possible.

Supply chain management strives for an integrated, multidisciplinary, multimethod approach.

1.2.1 Origin of the term and definitions:

The term Supply Chain Management was first coined by **Keith Oliver**, a consultant at **Booz Allen Hamilton**, introduced the term "supply chain management" to the public domain in an interview for the **Financial Times**, in **1982**.

In 1983, **Wirtschafts Woche** in Germany published for the first time the results of an implemented and so called "**Supply Chain Management project**", led by **Wolfgang Partsch** .

In the late 1990s, "supply chain management" (SCM) rose to prominence, and operations managers began to use it in their titles with increasing regularity.

1.2.2 Functions of Supply Chain Management:

The following are some of the basic functions of SCM are:

(i) Planning

a) Demand forecasting
b) Supply planning
c) Inventory planning
d) Production planning
e) Sales and operation planning

(ii) Sourcing

a) Supplier management
b) Procurement processes
c) Contract negotiation

d) Supplier relationship management

Figure1.0: Supply Chain Management Process

As discussed previously, our study aims to cover all the aspects of **Supply Chain Management** practices in a typical **Hospital or viz. Hospital Supply Chain Management (HSCM) System** scenario including Procurement, Purchase, Logistics, Hospital Management Information System (HMIS), the concept of **Turn-Around Time (TAT)**, **Lead Time**, Vendor Management, Rate Contracts, Hospital Inventory Management to achieve **optimization of the inventory to reduce cost and increase operational efficiency of the Hospital Pharmacy**.

1.3. Hospital Supply Chain Management:

The Supply Chain Management process that deals with the effective management of medical supplies, pharmaceuticals, and other health-related products so that they can be made available in the right place at the right time and in the right quantity.

Here are the key functions of HSCM:

a) Purchase Request to Purchase Order Fulfillment
b) Ensuring accountability and transparency in supply chain processes
c) Maintaining adequate Inventory levels in Pharmacy
d) Cost Reduction Management of Material Supply
e) Increase in Overall Hospital Operational Efficiency

Henceforth we will be discussing all the aspects related to Supply Chain Management with respect to Hospital only.

1.4 Procurement: Procurement is the **process of obtaining goods or services, typically for business purposes**. It involves a range of activities, including need identification, supplier or vendor research and sourcing, negotiation, contract management, order processing and maintaining supplier management relationships.

Figure:1.1: Procurement Lifecycle

Thus Effective procurement can help an organization reduce costs, ensure the quality of goods and services, and maintain smooth operations.

1.4.1. Hospital Procurement: Hospital procurement depicts how a Hospital or a Health institution acquires products and services to dispense the health service. Broadly or simply explaining, Hospital Procurement means to acquire Pharmaceuticals, Surgicals and Consumables, Disposables, Bio-Medical Devices and other necessary materials that helps in proper and smooth functioning of a Hospital.

A number of features marking hospital procurement are:

(i) Need Assessment: Medical supplies, equipment, and pharmaceuticals will be required in view of the needs of care to the patients and the operations of the hospital—associated services.

(ii) Supplier Management: Identification of suppliers who can meet the demands and requirements of a hospital or a health facility, that include quality of the goods and services offered, and the confirmation of quality standards and regulatory provisions. Thus Supplier Management includes Supplier Selection and Sourcing wherein an assessment of suppliers concerning cost, quality, delivery time, after-sales service, and many other such factors can be arrived at through open competitive bidding or through direct negotiation. Develop good relations with suppliers for practical supply, prompt solution to issues, and better purchase terms while negotiating better prices in future procurement.

(iii) Negotiation: Best price conditions, delivery schedule, warranty, and service agreement with the supplier.

(iv) Contract Management: Preparation of Contracts, Review of the Same, and its Management so that statutory and regulatory compliances adhere for safeguarding the interest of the Hospital.

(v) Order Processing and Inventory Management: Processing and issuing Purchase orders; further follow up on deliveries; keep track of the level of stock so that adequate supply is provided of it without overstocking it in the inventory.

(vi) Payment Process: To effect full and timely payment to the supplier while applying agreed-upon terms in compliance with the predetermined terms and conditions.

(vii) Technology and Data Management: Drive organizational process efficiency in processes, inventory management, spend tracking, and the optimization of overall procurement strategy through procurement technology and data analytics.

Effective hospital procurement ensures that the healthcare facility can provide high-quality patient care while managing costs and complying with regulatory standards.

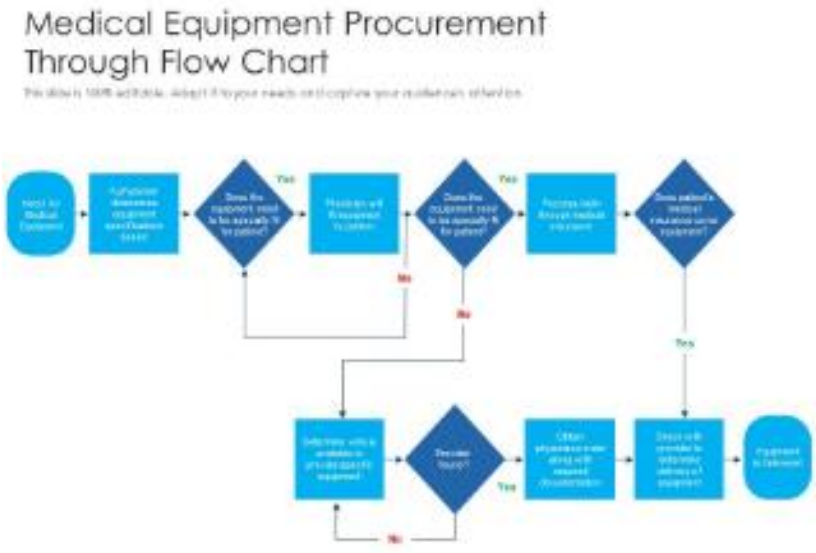


Figure:1.3: Hospital Medical Equipment Procurement Process

1.4.2 Purchase: Normally, process and the workflow followed by any hospital for buying drugs and medical equipment involve some of the following primary steps that are pursued for getting quality, cost effective, and compliant products.

Hospital Buying Process Workflow:-

(i) Identifying the Needs:

a) **Drugs, Vaccine, Injections and IV Fluids Requirement:** The Pharmacy Department mainly divided as OP & IP Pharmacy, list the the drugs, injections, IV Fluid brands, notified as per the treatment guidelines and

Formulary and coordinates with the Purchase & Procurement Team for the purchase of the quantity required to maintain adequate and optimum inventory.

b) **Bio-Medical Equipment & Consumables Equipment Requirements:** Even same process is followed also for bio-medical equipment procurement where the Bio-Medical Department approves equipment required to be procured or purchased.

(ii). Budget Approval:

a) The Purchase and Procurement Head prepares a budget request showing the cost estimate of drugs and equipment to be procured.

b) The budget is then examined and given a go-ahead by the Finance department depending on the available funds after prioritizing them based on the directives of the management.

(iii) Vendor Allocation and Management: A Vendor Market Research is done, where various Distributors, Stockiests and even some direct manufacturers are identified, reviewed and selected as Vendors or Suppliers based on the location of the Hospital, the margins and the discount provided and ultimately the quality of the product as well as the quality of the supply and the services provided.

(a) **Categorization Criteria:** Vendors are generally categorized based on the SKUs they supply whether as Drug, Injections and Vaccines, Bio-Medical equipment, authorization available with pharmaceutical and Biomedical and Medical Device companies (e.g. Authorized SUN Pharma Vendor), and even sometimes as Primary or Secondary Vendor, based on Discounts and Margins provided.

(b) **Request For Proposals/Quotations:** Issuance of RFP/RFQs to the selected suppliers is done whereby detailed guidelines regarding drugs/equipment, such as description, quantity to be supplied, and the associated time in the delivery (also known as Lead Time) of the same and verification criterion, that would involve: cost, delivery time, warranty, and after-sale service.

(c) **Evaluation and Selection:** Finally the evaluation and selection of Vendors and Supplirs is done on the basis of some of the parameters stated below as:

- **Medicines:** Cost, quality, supplier reliability, proposals based on regulatory compliance.
- **Medical Equipment:** Technical specification, cost, supplier credibility, compliance to health care standards. o_trials/demonstrations of medical

equipment if necessary to ensure the suitability of instrument to the needs of the hospital

(d) **Negotiation and Contracting:**

- Negotiation with the selected vendors the terms and conditions regarding price, delivery schedule, payment, warranty and service agreement is done and the
- Contracts draft and finalization is done as per legal and regulatory requirements.

(vi). Purchase Order (PO) Issuance:

Purchase orders would be prepared and issued against the selected suppliers of drugs or medical equipment, with the purchased line of drugs or medical equipment mentioned in the description. Description would include item, quantity, price, delivery date, and shipping instructions.

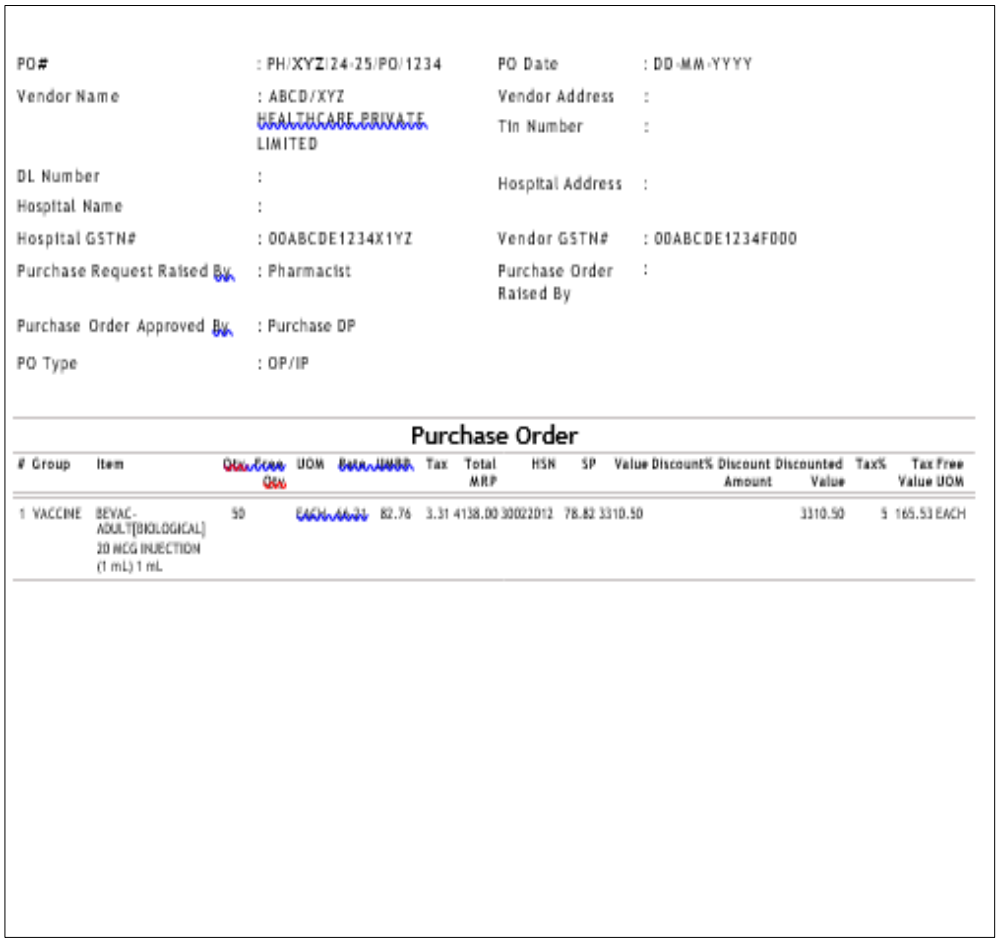
(vii) Receipt and Delivery: Inspection of the quality, quantity ordered, expiration dates are checked and the SKUs are received and entered into the MIS Software to reflect the Inventory digitally.

(viii) Payment Processing: After receiving of the stocks, Invoices are collected and kept for initiation of payment process from the Finance Department.

(ix) Post-Purchase Analysis: The Post Purchase Analysis is probably one the most important aspect of the Hospital Supply Chain System where parameters are set for correct Purchase Practices. A Post Purchase Analysis report is made, based on some of the following criteria:

(a) Formulary Adherence:

(b) Review of Suppliers Performance



PO# : PH/XYZ/24-25/PO/1234
PO Date : DD-MM-YYYY
Vendor Name : ABCD/XYZ HEALTHCARE PRIVATE LIMITED
Vendor Address :
Tin Number :
DL Number :
Hospital Name :
Hospital Address :
Hospital GSTN# : 00ABCDE1234X1YZ
Vendor GSTN# : 00ABCDE1234F000
Purchase Request Raised By : Pharmacist
Purchase Order Raised By :
Purchase Order Approved By : Purchase DP
PO Type : OP/IP

Purchase Order

#	Group	Item	Qty	Free Qty	UOM	Rate	UMRP	Tax	Total MRP	HSN	SP	Value	Discount%	Discount Amount	Discounted Value	Tax%	Tax Free Value	UOM
1	VACCINE	BEVAC-ADULT[BIOLOGICAL] 20 MCG INJECTION (1 mL) 1 mL	50		EACH	66.21	82.76	3.31	4138.00	30022012	78.82	3310.50			3310.50	5	165.53	EACH

Figure: 1.4 : A Typical Purchase Order Format

1.5 Inventory Management and Inventory Control Techniques:

It renders the **procurement, storage, and consumption process** transparent for all types of merchandise, drugs, and medical devices. It helps make the right type of **inventory available at the right place at the right time, minus overstocking, to avoid extra cost buildup**.

Hospital inventory management is considered one of the most critical jobs in the frontiers of high standards in patient care and, at the same time, one that should be at its peak of operational efficiency.

1.5.1 Hospital Inventory Management Components

(i) Inventory Tracking:

a) Can automate the inplace inventory management systems for real-time inventory reporting

b) High accuracy of barcode scanning and RFID technologies in tracking items

(ii). Stock Replenishment:

a) Define Re-Order point and the safety stock level per item. If reached an item is added to replenish order.

b) Demand forecast would be analyzed based on historical data and trend analysis to predict requirements in the future.

(iii). Storage and classification:

a) Classification of the storage facilities to access various goods, making sure to classify and categorize the facilities accordingly and space for enough;

b) Classify storage of perishable goods under favorable conditions, such as temperature and humidity, e.g., pharmaceutical, Vaccines, etc.

(iv). Physical stock taking and reconciliation:

a) To do the periodic physical counts of inventory in order to compare and reconcile the quantity in the system with what is physically sitting in the shelf.

b) More appropriate way to say cycle counting can be to review regular subsets of inventory so that there is 'measure of control over the inventory stocks' without effecting the day to day operations.

(v). Inventory Optimization:

a) Item identification through the principle of ABC analysis, under which there is a method of categorizing the items into groups that can direct the attention and activities of management toward those with high values or that are critical.

1.5.2 Techniques of Inventory Control:

a) Just-In-Time- Inventory is replenished just in the nick of time to prevent the holding cost and to keep the wastages at a minimum.

b) First-In, First-Out- Objective of oldest

c) Economic Order Quantity: A calculation that is utilized to find the optimal order quantity to purchase and hold inventory without incurring any extra, unwanted cost.

d) Safety Stock: Keep buffer stock to protect from demand momentum variation and the breaks in the supply chain.

e) Vendor-Managed Inventory: Enables the vendor products to be picked up for the vendor to manage inventory levels to increase efficiency and reduce the administrative load.

Importance of Effective Inventory Management

a) Savings: Reduced holding costs, less wastage and avoiding over stocking things.

b) Improved Patient Services: Assure availability of right equipment and appliances; therefore, no waiting patients' care.

c) Operational Efficiency: It helps in reducing the administrative burden and resulting errors as it streamlines the needs in procurement and inventory management

d) Regulatory Compliance: Appropriate documentation and adherence to health care regulations associated with inventory items is obtained through the process of inventory management

1.6.1 ABC, VED and FSN Analysis:

Various Inventory classification techniques followed by the hospitals are ABC, VED, and FSN analysis. Each of them focuses on various things and paves the way for effective and informed decision making while managing the different types of inventory in a proper manner.

1.6.1. ABC Analysis

ABC analysis is based upon the Pareto principle that holds that, a small percentage of items, frequently accounts for a large portion of total value. Inventory is classified as per this into three classes:

(i) . A Items

a. High value items would have a major effect on total inventory cost.

b. normally 10-20 percent of the items account for 70 to 80 percent of inventory value.

c. Require tight control, frequent review and accurate record-keeping

(ii). B Items

a) Moderate-value items that contribute a little share in the total inventory cost.

b) 20-30% of the items usually contribute 15-25% of the inventory value .

c) Moderate control and review regularly.

(iii).C Items:

a) Low-value items which has a minor effect on total inventory cost.

b) Usually 50-60% of the items contributing only 5-10% of the inventory value.

c) Less control and review less often.

1.6.2 VED Analysis

VED stands for categorization of the inventory items that need to be categorized into three as: Items that are vital, important, or critical to patient care and hospital operation

(i). Vital: It is supreme in importance for patient care and running the hospital therefore any scarcity may tantamount to disaster. Accordingly, such items should always be available and strictly controlled.

(ii). Essential Items: These are required necessarily; the deficiency can be accepted for a short period without causing much effect on the patient care; the state of these items should be reviewed and controlled regularly.

(iii). Desirable Items: They are non-critical and will not affect the patient care much in their absence.

1.6.3 FSN Analysis

Basically ABC analysis classifies inventory into three segments on the basis of usage frequency:

1. Fast-moving (F):

a. Items consumed frequently; the usage is above a prefixed limit.

b. Should be replenished at regular intervals, and the stock should be reviewed on regular intervals.

2. Slow-moving (S):

a. Consumed items less frequently; consumption happens between two specified limits.

b. Shall be required to revisit at some periodicity, and replenished at fixed intervals.

3. Non-moving / N:

a. Items which are never or hardly consumed/ the consumption of which reduces to happen less than a specific length of time period of overdue review for deletion or reduction in inventory.

1.6.4 ABC, VED, and FSN Analysis—Implementation

(i) Data Collection:

a) Collect data on consumption, cost and criticality of items
b) Can be achieved by means of past history, usage reports, comments received from clinicians and buyers

(ii). Categorization:

a) ABC Analysis: Determine consumption value which is a function of annual usage and unit cost of the equipment. List out the equipment in the decreasing order of consumption value and put them in A, B, and C categories.
b) VED Analysis: Ascertain rank of every item based on its significance to patient care and operations. Items would then be categorized as Vital, Essential and Desirable

c) FSN Analysis: Ascertain the consumption bloc of each item over some period. Items would then be categorized as Fast moving, Slow moving and Non-moving

3. Integration: Inference of ABC, VED and FSN analyses should collectively serve as the basis for the comprehensive approach to inventory management.

The determination of priority should be based mainly on the categories found: control measures should, in the end, be arrived at on a long-term basis.

A Combined Analysis Approach				
Item	**ABC Category**	**VED Category**	**FSN Category**	**Control Strategy**
Item 1	A	V	F	Tight control, frequent review
Item 2	B	E	S	Regular monitoring
Item 3	C	D	N	Infrequent review, consider disposal

Table: 1.5: A Combined Inventory Control Analysis Approach

Probably the most controlling process after the buying methods in hospital supply chain management is the contract-award process. It opens up procurement, makes it fair, effective, and structured for medical supplies, equipment, and services. This is just a process of screening of the vendor/supplier best fit to meet the needs of the hospital with the best value. In general, from the perspective of Hospital, the contract is generally allotted to any vendor qualifying for the same in the tender evaluation process by agreeing to supply the maximum quality of the product to the hospital at the maximum margin/minimum rate of supply of product, and that vendor becomes V1- Authorized Rate Contract (RC) Vendor in the hospital formulary.

1.7.1 Tender Evaluation Process for Hospital Supplies

(i). Preparation:

a) Surgical gloves and other consumable materials for use in a hospital.
b) Detailed specification and standard statements in respect of size of the material, sterility, etc., and its packaging.

(ii). Issue of Tender:

a) RFQ under oulletan is published specifying all requirements, evaluation criteria and deadline of receiving the same.

(iii). Receipt of Bids:

a) The bidders or sufficiently interested suppliers respond by submitting their bids before the deadline.

1.7.2 Rate-Contracts and Non-Rate Contracts: The most critical function that has to be effectively managed in a Hospital Supply Chain is that of Procurement. This would ensure that

supplies and equipment are available, effective in costs, and assurance of quality is assured. Accordingly, the two procurement approaches applied in the hospitals are rate contracts and non-rate contracts. It is only by knowing the differences, advantages, and applications of the two approaches that optimize the supply chain management in the hospital. The table below offers an understanding of the Rate Contract and Non Rate Contract

Aspect	Rate Contracts	Non-Rate Contracts
Pricing	Fixed for the contract period	Negotiated at the time of purchase
Quantity	Flexible, as needed within the contract scope	On-demand basis
Duration	Long-term (typically 1-5 years)	Short-term or single transaction
Cost Control	High, due to fixed prices	Low, due to price volatility
Supply Assurance	High, ensures continuous availability	Variable, depends on market conditions
Quality Control	Consistent, with defined standards	Variable, depends on the supplier
Administrative Effort	Lower, due to reduced tendering and simplified processes	Higher, due to frequent procurement activities
Flexibility	Lower, less adaptable to sudden changes	Higher, can respond quickly to market changes
Supplier Relationship	Strong, fosters long-term partnerships	Variable, often more transactional

Table:1.0: Difference between Rate Contract and Non-Rate Contract

1.8. Re-Order Label (ROL), Minimum Order Quantity (MOQ) and Economic Order Quantity(EOQ)-

In hospital supply chain management, several key concepts play crucial roles in ensuring efficient inventory management and procurement. Here's a breakdown of ROL (Reorder Level), MOQ (Minimum Order Quantity), and EOQ (Economic Order Quantity), and how they contribute to effective supply chain operations:

1.8.1 Reorder Level (ROL)

Definition: Reorder Level (ROL) refers to the inventory level at which a new order should be placed for a specific item to avoid stockouts. It is calculated based on the lead time (time between placing an order and receiving it) and the consumption rate (demand) of the item.

Function:

- **Trigger for Replenishment**: When the actual inventory level of an item falls to or below the reorder level, it signals the need to place a new order to restock the item.
- **Prevents Stockouts**: Helps in maintaining sufficient stock levels to meet demand and prevent interruptions in patient care or operations.
- **Calculations**:ROL is often calculated as:

  ROL=Lead Time Demand+Safety Stock

  ROL= Lead\ Time\ Demand + Safety\ StockROL=Lead Time Demand+Safety Stock, where Safety Stock is a buffer to account for variability in demand or lead time.

1.8.2 Minimum Order Quantity (MOQ)

Definition: Minimum Order Quantity (MOQ) is the smallest quantity of a product that a supplier is willing to deliver or that a buyer is willing to purchase in a single order. It is typically specified by the supplier based on production capabilities, shipping costs, or other economic factors.

Function:

- **Economic Considerations**: MOQ helps in optimizing procurement costs by ensuring that orders meet the supplier's minimum requirements for cost-effective production or delivery.
- **Bulk Purchases**: Often leads to bulk purchasing to take advantage of economies of scale and lower unit costs.
- **Logistical Efficiency**: Reduces the frequency of ordering and administrative costs associated with processing multiple smaller orders.

1.8.3 Economic Order Quantity (EOQ)

Definition: Economic Order Quantity (EOQ) is the optimal quantity of inventory that should be ordered each time to minimize total inventory costs, including ordering costs and holding costs.

Function:

- **Cost Optimization**: EOQ helps in balancing the costs associated with ordering (e.g., procurement costs, shipping) and holding inventory (e.g., storage, obsolescence).
- **Formula**: EOQ is calculated using the formula: EOQ=2×D×SHEOQ = \sqrt{\frac{2 \times D \times S}{H}}EOQ=H2×D×S, where:
  - DDD = Annual demand (units)

- SSS = Ordering cost per order
- HHH = Holding cost per unit per year

Benefits:

- **Reduces Costs**: Ensures that inventory costs are minimized by determining the optimal order quantity.
- **Efficient Inventory Management**: Helps in maintaining adequate stock levels without overstocking or understocking.
- **Improves Cash Flow**: Balances cash flow by optimizing inventory levels and reducing tied-up capital in excess stock.

Application in Hospital Supply Chains

- **Critical Supplies**: ROL ensures that critical medical supplies are always available to meet patient needs without delays.
- **Efficiency**: MOQ and EOQ calculations help hospitals optimize procurement processes, reduce costs, and ensure efficient use of resources.
- **Patient Safety**: Maintaining optimal inventory levels through these methods supports patient safety by reducing the risk of stockouts or overstocking.

Integration with Technology

- **Inventory Management Systems**: Automated systems can calculate and track ROL, MOQ, and EOQ, generating alerts when stocks need replenishment.
- **Data Analytics**: Utilizing data analytics helps in forecasting demand more accurately, improving the precision of ROL and EOQ calculations.
- **Supplier Relationships**: Collaborating closely with suppliers to align MOQ requirements and optimize ordering processes based on EOQ calculations.

By leveraging ROL, MOQ, and EOQ effectively in hospital supply chain management, healthcare facilities can enhance operational efficiency, reduce costs, and ensure continuous availability of essential supplies, ultimately supporting better patient care outcomes.

1.9. Management Information System (MIS) and Enterprise Resource Planning (ERP) Systems:

1.9.1.1Hospital Management Information System (HMIS)

Definition: Hospital Management Information System (HMIS) is a comprehensive, integrated system designed to manage healthcare-related information across various departments within a hospital or healthcare organization. It focuses on improving clinical and administrative workflows, enhancing patient care, and ensuring efficient management of healthcare services.

Key Functions:

- **Patient Management**: Maintains patient demographics, medical history, treatment plans, and appointments.
- **Clinical Support**: Provides clinical decision support tools, electronic health records (EHR), and medical imaging management.
- **Billing and Finance**: Manages billing, insurance claims processing, financial transactions, and revenue cycle management.
- **Inventory Management**: Tracks medical supplies, pharmaceuticals, equipment, and manages stock levels.
- **Quality Assurance**: Monitors compliance with healthcare regulations, quality standards, and patient safety protocols.

Examples of HMIS:

1. **Epic Systems**: Epic is a widely used HMIS that integrates various aspects of healthcare management, including EHR, scheduling, billing, and patient engagement. It supports large healthcare organizations and facilitates interoperability among different healthcare providers.
2. **Cerner Corporation**: Cerner provides HMIS solutions that streamline clinical and administrative workflows, improve patient care coordination, and enhance operational efficiency. It offers integrated solutions for EHR, population health management, and revenue cycle management.
3. **Allscripts Healthcare Solutions**: Allscripts offers HMIS solutions that cater to both small clinics and large hospital networks. Their systems include EHR, practice management, and patient engagement tools to optimize healthcare delivery and patient outcomes.

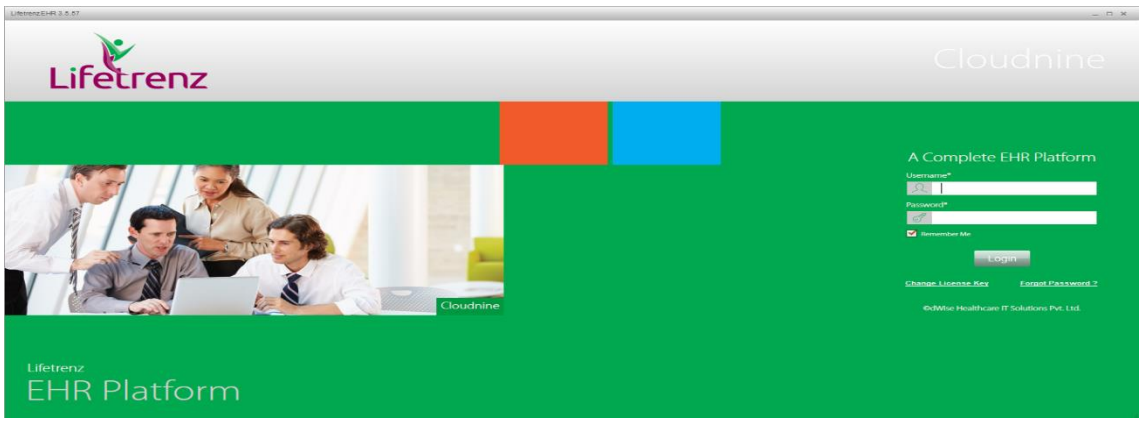


Figure: 1.6: Opening page of an HMIS Software

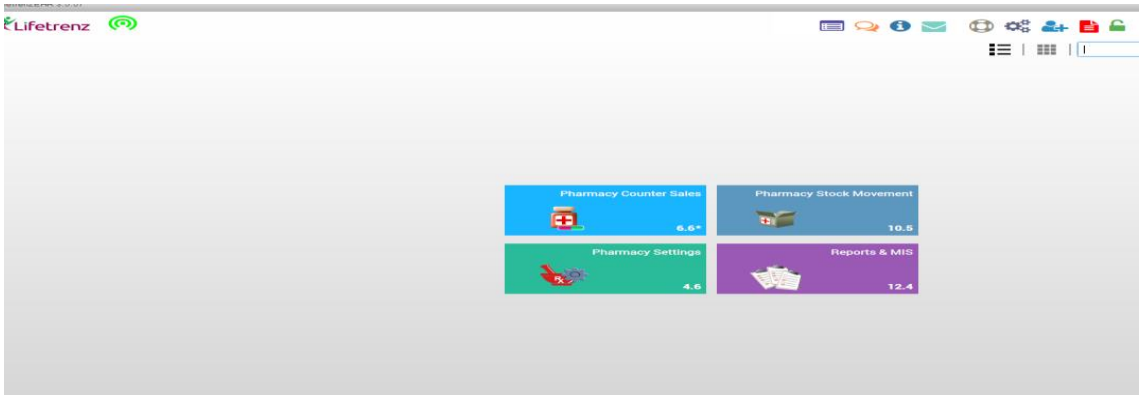


Figure: 1.6.1(continued): Working Page of an HMIS Software

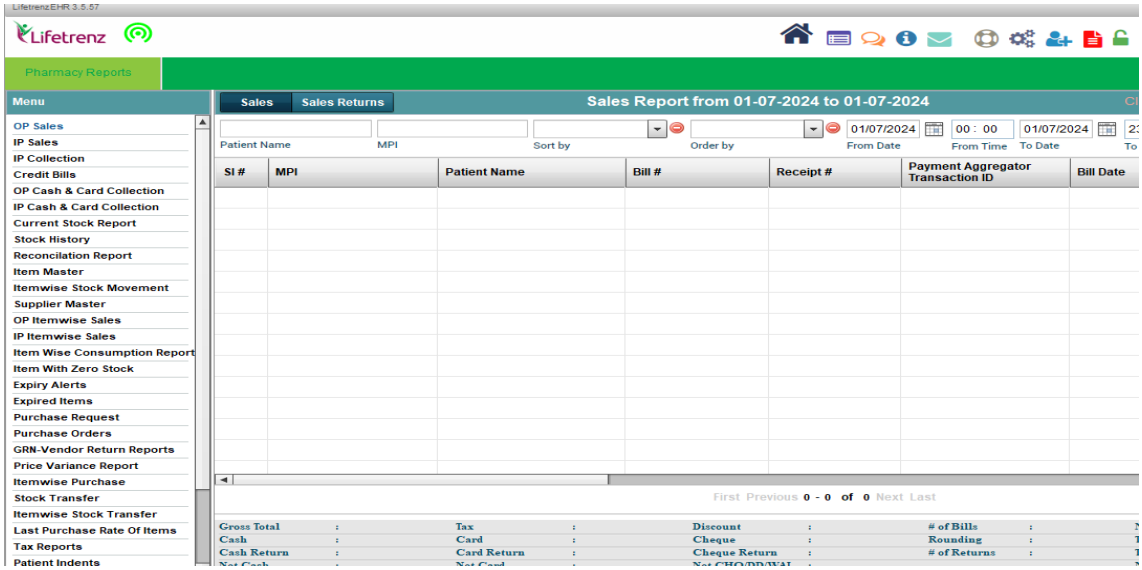


Figure: 1.6.2(continued): Report Section stored in MIS System

1.9.2 Enterprise Resource Planning (ERP)

Definition: Enterprise Resource Planning (ERP) is a centralized software system that integrates core business processes and functions across an entire organization. In the context of healthcare, ERP systems extend beyond clinical operations to encompass financial management, supply chain management, human resources, and more.

Key Functions:

- **Financial Management**: Manages accounting, budgeting, financial reporting, and revenue management.
- **Supply Chain Management**: Tracks procurement, inventory management, supply chain logistics, and vendor relationships.
- **Human Resources**: Handles employee management, payroll processing, workforce scheduling, and training.
- **Patient Relationship Management**: Manages patient interactions, appointments, and customer service.
- **Analytics and Reporting**: Provides real-time data analytics, performance metrics, and decision support tools.

Examples of ERP in Healthcare:

1. **SAP Healthcare**: SAP offers ERP solutions tailored for healthcare organizations, integrating financial management, supply chain operations, HR management, and patient management. It enables comprehensive data analysis and supports operational efficiency across healthcare networks.
2. **Oracle Healthcare**: Oracle provides ERP systems that streamline healthcare operations, including financial management, supply chain optimization, human capital management, and patient engagement. It supports healthcare providers in managing costs, improving patient outcomes, and complying with regulatory requirements.
3. **Microsoft Dynamics 365 for Healthcare**: Microsoft's ERP solution integrates financial management, supply chain operations, patient management, and analytics. It leverages cloud-based technologies to enhance collaboration, data security, and scalability for healthcare organizations.

Integration and Interplay

- **Synergy**: HMIS and ERP systems complement each other by integrating clinical and administrative functions with broader organizational operations. They facilitate seamless data flow, improve decision-making, and enhance operational efficiency.
- **Data Interoperability**: Ensuring interoperability between HMIS and ERP systems is essential for exchanging accurate and timely information across different departments and systems within a healthcare organization.

- **Optimization**: Together, HMIS and ERP systems contribute to optimizing healthcare delivery, improving patient care quality, reducing costs, and enhancing overall organizational performance.

ERP systems and HMIS play essential roles in modern healthcare management by integrating and managing core business processes and healthcare-specific operations, respectively. Their effective implementation and integration are vital for enhancing organizational performance, achieving regulatory compliance, and delivering high-quality patient care across healthcare settings.

All the broad areas of concern related to Hospital Procurement and Purchase and other Supply Chain Management have been covered in detail and now the main aim of the Article that made studies on the ways to to **Optimize the Inventory (Drugs, Pharma and Bio-Medical Equipment Stocks) in a single speciality (Maternity, Women & Child Care) Hospital by reducing or downsizing the Inventory Stock Holding Days in the Hospital Pharmacy, will be discussed in detail.**

Chapter 2

Review of Literature

Various resources* such as books, journals, articles, research papers, websites and studies have been reviewed in order to gain in-sights and references as how much

work has been previously done to cover our current studies and findings.

These led to the conclusion that Cost management in healthcare, particularly through reducing or downsizing inventory days or stock holding days, involves strategic inventory management practices aimed at optimizing resource utilization while ensuring continuous availability of essential supplies. Here are key strategies and considerations for achieving this:

Strategies for Reducing Inventory Days:

1. **Demand Forecasting and Planning**:
    - Implement robust demand forecasting models based on historical data, patient volume projections, and seasonal trends.
    - Use predictive analytics to anticipate future demand and adjust inventory levels accordingly.
2. **Just-in-Time (JIT) Inventory Management**:
    - Adopt JIT principles to minimize excess inventory by ordering supplies only when needed.
    - Enhance coordination with suppliers to ensure timely delivery of supplies to meet demand without overstocking.
3. **ABC Analysis**:
    - Classify inventory items based on their value and usage frequency (e.g., high, medium, low).
    - Prioritize management efforts and investment in inventory control based on criticality and usage.
4. **Inventory Optimization Tools**:
    - Utilize inventory optimization software to calculate optimal stock levels, reorder points, and safety stocks.
    - Leverage technology for automated inventory tracking, real-time updates, and inventory control alerts.
5. **Supplier Collaboration and Contract Management**:
    - Establish strategic partnerships with reliable suppliers to negotiate favorable terms, pricing, and delivery schedules.
    - Implement vendor-managed inventory (VMI) or consignment inventory agreements to shift inventory ownership and management responsibilities to suppliers.

Benefits of Reducing Inventory Days:

- **Cost Savings**: Lower holding costs including storage, maintenance, and insurance costs associated with excess inventory.
- **Working Capital Optimization**: Reduce tied-up capital in inventory, improving cash flow and liquidity for other operational needs.
- **Operational Efficiency**: Streamline inventory management processes, reduce waste, and enhance resource allocation efficiency.
- **Risk Mitigation**: Minimize the risk of obsolete or expired inventory, ensuring supplies are current and usable.

Challenges and Considerations:

- **Balancing Supply and Demand**: Ensure adequate inventory levels to meet patient care needs without compromising service delivery.
- **Supplier Reliability**: Dependence on suppliers' ability to consistently deliver on-time and in full.
- **Technology Integration**: Invest in and integrate robust inventory management systems that align with healthcare-specific needs and regulatory requirements.
- **Staff Training and Support**: Provide training to staff on new inventory management practices and technologies to ensure effective implementation and compliance.

Implementation Steps:

1. **Assessment and Analysis**:
    - Conduct a comprehensive assessment of current inventory practices, costs, and performance metrics.
    - Analyze inventory turnover rates, carrying costs, and potential areas for improvement.
2. **Strategic Planning**:
    - Develop a cost management strategy with clear objectives, timelines, and performance metrics.
    - Set targets for reducing inventory days while maintaining service levels and patient care standards.
3. **Pilot Programs and Monitoring**:
    - Implement pilot projects to test new inventory management strategies and technologies.

- Monitor key performance indicators (KPIs) such as inventory turnover ratio, stock-out rates, and cost savings.

4. **Continuous Improvement**:
    - Regularly review and adjust inventory management practices based on performance data and feedback.
    - Foster a culture of continuous improvement and innovation in inventory management processes.

By effectively reducing inventory days or stock holding days through these strategies, healthcare organizations can achieve significant cost savings, optimize resource utilization, and enhance operational efficiency while maintaining high standards of patient care.

Chapter 3

Methodology

Our study specifically highlights the importance of VED and FSN Analysis in reducing or down-sizing the Inventory Stock Holding Days.

As discussed previously in the abstract, a different methodology has been developed to

optimize the inventory by reducing or down-sizing inventory stock holding days.

A following methodology has been developed step by step :

(i) Identifying the No. of Drugs, Surgicals, Consumables used in the typical Pharmacy i.e Analyzing the Item- Master of the Pharmacy

(ii) After a detailed analysis of the Pharmacy Item Masters, segmentation/classification is done to label the items as the Vitals, Essential and Desirable Category.

(iii) From the MIS Reports, Consumption pattern of each Item is shown to indicate their FSN Nature

(iv) After the FSN Nature of Items a further classification is done where both VED-FSN is made further sort out items.

(v) Then as per the Rate and MRP of Supply, the Purchase value is calculated, items having highest purchase value to lowest.

(vi) The Unit Consumption Report of up to last 3 months is taken into consideration.

The below excel sheet best describes the format of the study:

ITEM DETAILS		CONSUMPTION PATTERN								VED-FSN ANALYSIS		PURCHASE VALUE AND STOCK HOLDING							
Sl No.	Items	VED	Holding Q	Feb-24	Mar-24	Apr-24	Total	Per day	Movemer	FSN	VED-FSN	Unit Cost	Inventory	DOI on ba	Excess Stc	Holding V	Stock (Qty	Stock valu	Extra Stock val

Table:3.1: Excel Sheet for demonstrating the following method

3.1 Procedures-

(i) A total of 100 Items were taken as as Sample and after verifying consumption reports, Required, Not Required and Adequate or In-adequate stock was determined.

(ii) VED Item wise Labelling and 3 months consumption reports.

(iii) VED-FSN Analysis of Data

(iv) Whether Stock is Required, Not Required or Insufficient.

The following figure shows the data:-

ITEM DETAILS		CONSUMPTION PATTERN								ED-FSN ANALYSI		PURCHASE AND STOCK HOLDING			
Sl No.	Items	VED	Holdin	Feb	Mar	Apr	Total	Per day	Move	FSN	VED-FSN	Unit Cost	Inventory	DOI on ba	Excess Sto
1	FLUARIX TETRA 2024 S H[G] 1 UNIT PRE FILLE	Vitals	120	0	0	0	0	0	0	N	Vitals N	819	No Cons	3	Not Requi
2	CUROSURF[CHIESI] 240 MG INJ (3 mL)	Vitals	4	1	2	0	0	0	2	F	Vitals F	18004.94	No Cons	15	Not Requi
3	CONSUMABLES OTHERS (DBS)	Desired	144	204	189	114	507	16.9	3	F	Desired F	88.6	8.52071	7	-1.52071
4	PNEUBEVAX 14[BIOLOGICAL] 1 UNIT INJECTI	Essenti	45	8	5	7	20	0.667	3	F	Essential	1704	67.5	10	-57.5
5	GONAL-F[P&G] 300 I.U PFP (0.5 mL)	Vitals	16	9	1	0	0	0	2	F	Vitals F	3916.01	No Cons	15	Not Requi
6	SURGEON GOWN ECONOMY (MEDISAFE)	Desired	149	141	185	141	467	15.57	3	F	Desired F	66.5	9.571734	7	-2.57173
7	VAXIFLU-4[ZYDUS] 1 UNIT PFS (0.5 mL)	Vitals	125	14	6	9	29	0.967	3	F	Vitals F	546	129.3103	15	-114.31
8	MENOPUR[FERRING] 1200 IU INJECTION (1 vi	Vitals	2	0	0	0	0	0	0	N	Vitals N	27385.51	No Cons	3	Not Requi
9	GONAL-F[P&G] 450 I.U PFP (0.75 mL)	Vitals	9	5	0	1	0	0	2	F	Vitals F	5838.38	No Cons	15	Not Requi
10	BIVALENT ORAL POLIO[BHARAT] DROP (2 mL	Vitals	5367	186	177	134	497	16.57	3	F	Vitals F	8.83	323.9638	15	-308.964
11	VARIPED[MSD] 1350 PFU INJ (0.5 mL)	Desired	65	184	126	92	402	13.4	3	F	Desired F	1580.8	4.850746	7	2.149254
12	SYNFLORIX[GLAXO] 1 DOSE PFS (0.5 mL)	Essenti	38	10	13	7	30	1	3	F	Essential	1313.64	38	10	-28
13	TEGADERM 8591 (3M)	Essenti	208	99	97	56	252	8.4	3	F	Essential	287.6	24.7619	10	-14.7619
14	CETROTIDE[MERCK] 0.25 MG INJECTION (1 vi	Vitals	26	12	4	0	0	0	2	F	Vitals F	1301.56	No Cons	15	Not Requi
15	FLUQUADRI[SANOFI] 1 DOSE PFS (0.5 mL)	Vitals	49	106	31	0	0	0	2	F	Vitals F	682.5	No Cons	15	Not Requi
16	GARDASIL[MSD] 1 UNIT PFS (0.5 mL)	Essenti	34	25	24	20	69	2.3	3	F	Essential	2722.72	14.78261	10	-4.78261
17	PREMICATH 28G-1FR [1261.20] (VYGON)	Vitals	6	2	0	2	0	0	2	F	Vitals F	4893.12	No Cons	15	Not Requi
18	PARIETEX COMPOSITE MESH [PCO15FX] 15CM	Vitals	1	0	0	0	0	0	0	N	Vitals N	28116	No Cons	3	Not Requi
19	ROTAVAC 5D[BHARAT] 1 UNIT PFS (0.5 mL)	Desired	2	122	120	88	330	11	3	F	Desired F	470	0.181818	7	6.818182
20	TYPHIBEV[BIOLOGICAL] 25 MCG PFS (0.5 mL)	Vitals	79	20	24	26	70	2.333	3	F	Vitals F	631.54	33.85714	15	-18.8571
21	ANTI-D 150[BHARATH] 150 MCG PFS (1 mL)	Vitals	14	0	2	1	0	0	2	F	Vitals F	1984.83	No Cons	15	Not Requi
22	CUROSURF[CHIESI] 80 MG INJ (1.5 mL)	Vitals	3	1	0	0	0	0	1	S	Vitals S	9002.47	No Cons	7	Not Requi
23	IMMUNOREL[RELIANCE] 5 GRAM INFUSION (	Vitals	3	0	0	0	0	0	0	N	Vitals N	9000	No Cons	3	Not Requi
24	ANTI D 300[BHARATH] 300 MCG PFS (1 mL)	Vitals	9	4	0	9	0	0	2	F	Vitals F	2940.83	No Cons	15	Not Requi
25	NEW BORN BABY DRESS SINGLE (SV APPAREL	Essenti	108	36	78	55	169	5.633	3	F	Essential	510	19.1716	10	-9.1716
26	GARDASIL 9[MSD] PFS (0.5 mL)	Essenti	9	7	7	3	17	0.567	3	F	Essential	7898.8	15.88235	10	-5.88235
27	INFANT RESPIRATORY CARE SYSTEM [RT265]	Essenti	7	0	1	0	0	0	1	S	Essential	3693.12	No Cons	5	Not Requi
28	OROFER S[EMCURE] 200 MG INJ (10 mL)	Vitals	117	14	9	4	27	0.9	3	F	Vitals F	249.04	130	15	-115
29	FOLISURGE[INTAS] 900 I.U INJECTION (1 vial)	Essenti	4	0	0	0	0	0	0	N	Essential	6232.98	No Cons	2	Not Requi
30	POWD NAN EXCELLA PRO 2[NESTLE] 1 UNIT P	Essenti	42	5	8	2	15	0.5	3	F	Essential	668.83	84	10	-74
31	ZYVAC T C V[ZYDUS] 1 UNIT PFS (0.5 mL)	Vitals	39	0	0	0	0	0	0	N	Vitals N	582.4	No Cons	3	Not Requi
32	APTAMIL PRETERM[DANONE] 1 UNIT POWDE	Essenti	45	4	1	1	6	0.2	3	F	Essential	520.38	225	10	-215
33	DUROGESIC[JOHNSON] 25 MCG/HOUR PTCH	Vitals	34	3	1	7	11	0.367	3	F	Vitals F	690	92.72727	15	-77.7273
34	ROTATEQ[MSD] 1 DOSE TUBE (2 mL)	Desired	146	79	93	47	219	7.3	3	F	Desired F	653.16	20	7	-13
35	INOSYS CIRCUIT KIT [BC4110/6110/3110/2110	Vitals	3	0	0	0	0	0	0	N	Vitals N	6229.44	No Cons	3	Not Requi
36	FACE MASK N95 V-4420+ (VENUS)	Essenti	1741	60	79	61	200	6.667	3	F	Essential	11	261.15	10	-251.15
37	MANFORCE CONDOMS 3'S (MANKINND)	Essenti	800	0	0	0	0	0	0	N	Essential	22.8	No Cons	2	Not Requi
38	BAKRI POSTPARTUM BALLOON [J-SOS-10050	Vitals	2	0	0	0	0	0	0	N	Vitals N	8000	No Cons	3	Not Requi
39	DULCOFLEX[SANOFI] 10 MG SUPP (5 supposit	Desired	38	101	73	32	206	6.867	3	F	Desired F	27.63	5.533981	7	1.466019
40	BILIBLANKET PHOTOTHERAPY COVER [6600-0	Essenti	35	15	6	11	32	1.067	3	F	Essential	636.48	32.8125	10	-22.8125
41	FOLICULIN HP[BHARATH] 150 I.U INJ (1 vial)	Vitals	26	0	0	0	0	0	0	N	Vitals N	585.88	No Cons	3	Not Requi
42	SUSTEN[SUN] 300 MG CAP (10 cap)	Vitals	489	90	30	0	0	0	2	F	Vitals F	28.93	No Cons	15	Not Requi
43	TOSIBAN 37.5 MG[ZUVENTUS] 7.5 MG/1 ML I	Essenti	7	3	1	4	8	0.267	3	F	Essential	3252.9	26.25	10	-16.25
44	FERONIA-FCM 500[ZUVENTUS] 500 MG INJEC	Essenti	10	0	6	10	0	0	2	F	Essential	1387	No Cons	10	Not Requi
45	ORGALUTRAN[ORGANON] 0.25 MG PENFILL (	Vitals	10	5	0	0	0	0	1	S	Vitals S	1384	No Cons	7	Not Requi
46	INTRAOSSEOUS INFUSION NEEDLE 15G -ADJU	Essenti	9	0	0	0	0	0	0	N	Essential	1533	No Cons	2	Not Requi
47	ET CATHETER WITH STYLET WALLACE	Essenti	7	0	0	0	0	0	0	N	Essential	1950	No Cons	2	Not Requi
48	NOMOLINE HH ADULT/PEDIATRIC AIRWAY AI	Vitals	10	0	0	0	0	0	0	N	Vitals N	1350	No Cons	3	Not Requi
49	PAMPERS PREMIUM CARE PANTS BABY DIAPI	Essenti	6	0	0	0	0	0	0	N	Essential	2248.4	No Cons	2	Not Requi
50	INFANRIX HEXA[GLAXO] PFS (0.5 mL)	Vitals	74	68	45	22	135	4.5	3	F	Vitals F	2074.8	16.44444	15	-1.44444

Figure:3.2: Data Collection

Chapter 4

Results and Discussions

This chapter presents the results of the study conducted. Results are commonly presented in the form of text, figures and tables, complete with data analysis.

The study conducted shows the following results:-

(i) Findings:- A total of **100 Items** were taken as as **Sample** and after verifying consumption reports, Required, Not Required and Adequate or In-adequate stock was determined.

The following report shows the data:-

51	PORTEX EPIDURAL MINIPACK 18G [100/391/1	Essenti	13	2	6	3	11	0.367	3	F	Essential I	1380	35.45455	10	-25.4545
52	RD SET NEO PT SPO2 [NEONATAL-4004] (MAS	Vitals	17	1	7	5	13	0.433	3	F	Vitals F	1225	39.23077	15	-24.2308
53	NASONEX[MSD] 50 MCG NASAL SPRAY (120 M	Vitals	31	11	7	0	0	0	2	F	Vitals F	407.14	No Cons	15	Not Requ
54	VIREX I I 256[DIVERSEY] DISINFECTANT SOLU	Essenti	5	0	0	0	0	0	0	N	Essential I	2517.5	No Cons	2	Not Requ
55	VASOCLAMP [CORD CLAMP-2460] (POLYMED	Desired	151	114	19	44	177	5.9	3	F	Desired F	3.99	25.59322	7	-18.5932
56	GILSON PIPETTE TIPS INDIVIDUAL WRAPPED	Essenti	593	0	0	0	0	0	0	N	Essential I	20.59	No Cons	2	Not Requ
57	ZINCOVIT[APEX] DROP (15 mL)	Desired	109	62	52	35	149	4.967	3	F	Desired F	39.05	21.94631	7	-14.9463
58	UMBILICAL DOUBLE LUMEN CATHETER 3.5FR	Vitals	14	2	2	2	6	0.2	3	F	Vitals F	1057.92	70	15	-55
59	INFANT BONNET 22-25CM [BC303-05] (FISHE	Vitals	9	0	0	1	0	0	1	S	Vitals S	1232.64	No Cons	7	Not Requ
60	TUBERVAC[SERUM] 1 MILLION UNITS INJ (1 m	Vitals	130	0	1	0	0	0	1	S	Vitals S	85	No Cons	7	Not Requ
61	NO CODING 1+ BLOOD GLUCOSE TEST STRIPS	Vitals	2101	0	0	0	0	0	0	N	Vitals N	5.25	No Cons	3	Not Requ
62	VALLEYLAB NEONATAL CAUTERY PLATE [E751	Vitals	5	0	0	1	0	0	1	S	Vitals S	2200	No Cons	7	Not Requ
63	Sample Cup - Pcs	Essenti	1	0	0	0	0	0	0	N	Essential I	10983	No Cons	2	Not Requ
64	SUSTEN[SUN] 200 MG INJ (2 mL)	Vitals	70	1	3	2	6	0.2	3	F	Vitals F	163.68	350	15	-335
65	SPINAL NEEDLE 27G WHITACRE [405128] (BD)	Vitals	40	0	5	8	0	0	2	F	Vitals F	273.02	No Cons	15	Not Requ
66	VICRYL 2-0 NW2317 (ETHICON)	Essenti	43	13	12	7	32	1.067	3	F	Essential I	332.69	40.3125	10	-30.3125
67	PRECURCELL PRP KIT (RECUES)	Essenti	6	3	2	0	0	0	2	F	Essential I	1750	No Cons	10	Not Requ
68	MOTIL[ANDRO] TAB (10 tab)	Essenti	290	0	0	130	0	0	1	S	Essential S	35.92	No Cons	5	Not Requ
69	ALTACEF INJ[GLENMARK] 1.5 GRAM INJ (1 via	Essenti	199	0	155	191	0	0	2	F	Essential I	52.25	No Cons	10	Not Requ
70	GESTOFIT SR[ALEMBIC] 300 MG TAB (10 tab)	Essenti	320	190	30	0	0	0	2	F	Essential I	32.44	No Cons	10	Not Requ
71	SURGICEL 2X3 1953 (ETHICON)	Vitals	15	4	3	5	12	0.4	3	F	Vitals F	1151.88	37.5	15	-22.5
72	TRUBARB 0,30CM [BSN0316U] (HEALTHIUM)	Vitals	6	0	0	0	0	0	0	N	Vitals N	1682.76	No Cons	3	Not Requ
73	NITRITE POWDER FREE NITRILE EXAMINATIO	Essenti	5300	0	200	0	0	0	1	S	Essential S	1.9	No Cons	5	Not Requ
74	OSSOPAN D[TTK] ORAL SUSP (200 mL)	Essenti	113	45	37	17	99	3.3	3	F	Essential I	123.63	34.24242	10	-24.2424
75	TEGADERM 1623 (3M)	Essenti	749	340	335	280	955	31.83	3	F	Essential I	22.89	23.5288	10	-13.5288
76	GONAL-F[P&G] 75 IU INJECTION (1 vial)	Vitals	9	14	4	0	0	0	2	F	Vitals F	1088.29	No Cons	15	Not Requ
77	DREAM-MA XT[HEALTHON] TAB (10 tab)	Essenti	150	40	0	120	0	0	2	F	Essential I	63.05	No Cons	10	Not Requ
78	APTAGROW VANILLA BIB[DANONE] 1 UNIT P	Essenti	21	0	1	1	0	0	2	F	Essential I	449.55	No Cons	10	Not Requ
79	GESTOFIT SR[ALEMBIC] 200 MG TAB (10 tab)	Essenti	410	120	30	0	0	0	2	F	Essential I	22.87	No Cons	10	Not Requ
80	POWD NEOLACT MMF PLUS[NEOLACTA] POV	Essenti	40	0	0	0	0	0	0	N	Essential I	232.96	No Cons	2	Not Requ
81	HUMOG HP[BHARATH] 150 I.U INJ (1 vial)	Vitals	29	8	1	3	12	0.4	3	F	Vitals F	401.85	72.5	15	-57.5
82	FIONA[MERIL] 20 MCG/24 HOUR IUD (1 devic	Essenti	8	0	3	0	0	0	1	S	Essential S	1128	No Cons	5	Not Requ
83	BABY BATH TUB (GOKIDZ)	Desired	40	75	9	44	128	4.267	3	F	Desired F	595	9.375	7	-2.375
84	EPICUTANEO CAVA CATHETER 24G-2FR [1284	Vitals	3	0	0	0	0	0	0	N	Vitals N	2975.04	No Cons	3	Not Requ
85	POWD NEOLACT MMF PLUS[NEOLACTA] POV	Essenti	20	0	0	0	0	0	0	N	Essential I	441.93	No Cons	2	Not Requ
86	SMOFLIPID 20%[FRESENIUS] INJ (100 mL)	Vitals	35	5	6	8	19	0.633	3	F	Vitals F	343.9	55.26316	15	-40.2632
87	POWD NAN PRO 2[NESTLE] POWDER (450 gra	Essenti	15	5	7	0	0	0	2	F	Essential I	578.3	No Cons	10	Not Requ
88	VENFLON PRO SAFETY IV CANNULA 22G [393	Vitals	163	49	44	31	124	4.133	3	F	Vitals F	84.91	39.43548	15	-24.4355
89	TOSIBAN 6.75 MG[ZUVENTUS] 7.5 MG/1 ML I	Essenti	8	0	0	1	0	0	1	S	Essential S	1071.53	No Cons	5	Not Requ
90	NORMOZ-DS[SUN] TAB (10 tab)	Essenti	310	110	90	0	0	0	2	F	Essential I	27.53	No Cons	10	Not Requ
91	BIOGLANDIN[UNITED] 500 MCG INJ (1 vial)	Essenti	2	0	1	0	0	0	1	S	Essential S	4214.22	No Cons	5	Not Requ
92	MOM CARE MATERNITY PAD 7'S (AKRUTI PRO	Essenti	120	0	0	0	0	0	0	N	Essential I	70	No Cons	2	Not Requ
93	DYDROBOON[MANKIND] 10 MG TAB (10 tab)	Essenti	350	0	0	90	0	0	1	S	Essential S	23.75	No Cons	5	Not Requ
94	NEOSEAL S [N421] (NEOTECH)	Vitals	88	0	0	0	0	0	0	N	Vitals N	94	No Cons	3	Not Requ
95	SIMILAC ADVANCE-1[ABBOTT] POWDER (400	Essenti	13	0	0	0	0	0	0	N	Essential I	632.37	No Cons	2	Not Requ
96	SODIUM CHLORIDE 0.9%[AMANTA] 0.9 %W/V	Essenti	1773	319	209	203	731	24.37	3	F	Essential I	5.37	72.76334	10	-62.7633
97	VARILRIX[GLAXO] 1 UNIT INJ (0.5 mL)	Desired	74	22	68	35	125	4.167	3	F	Desired F	1524.64	17.76	7	-10.76
98	FOLISURGE[INTAS] 300 I.U PFP (0.48 mL)	Vitals	17	9	7	12	28	0.933	3	F	Vitals F	2707.5	18.21429	15	-3.21429
99	NEONATAL PICC PLACEMENT KIT [80199.519]	Essenti	5	2	0	1	0	0	2	F	Essential I	1616.64	No Cons	10	Not Requ
100	UMBILICAL PLACEMENT PACK [80199.695] (V	Essenti	3	0	1	1	0	0	2	F	Essential I	2648.64	No Cons	10	Not Requ

Figure: 4.1: Data and Finding Report

4.1 Interpretation of Results- The above mentioned table shows the following results**:**

(v) Item-wise VED-FSN Analysis

(vi) Consumption Based Purchase Value

(vii) Stock to be kept in hand, mapped as per VED-FSN Data

(viii) Whether Stock is Required, Not Required or Insufficient.

4.2 Results: From the tables and figures mentioned above, the following table shows the results:

Category	Fast	Slow	Non-Moving	Total
Vital	26	5	13	44
Essential	27	7	12	46
Desirable	10	0	0	10
Total	63	12	25	**100**

Table 4.1: Result Table

In the above mentioned excel sheet, the stock which is required or not can be mapped out and Inventory Days can be adjusted depending upon the above result table-

ITEM DETAILS		CONSUMPTION PATTERN								ED-FSN ANALYSI		PURCHASE AND STOCK HOLDING			
Sl No.	Items	VED	Holdin	Feb	Mar	Apr	Total	Per day	Move	FSN	VED-FSN	Unit Cost	Inventory	DOI on ba	Excess Sto
1	FLUARIX TETRA 2024 S H[G] 1 UNIT PRE FILLED	Vitals	120	0	0	0	0	0	0	N	Vitals N	819	No Cons	3	Not Requi
2	CUROSURF[CHIESI] 240 MG INJ (3 mL)	Vitals	4	1	2	0	0	0	2	F	Vitals F	18004.94	No Cons	15	Not Requi
3	CONSUMABLES OTHERS (DBS)	Desired	144	204	189	114	507	16.9	3	F	Desired F	88.6	8.52071	7	-1.52071
4	PNEUBEVAX 14[BIOLOGICAL] 1 UNIT INJECTIO	Essenti	45	8	5	7	20	0.667	3	F	Essential I	1704	67.5	10	-57.5
5	GONAL-F[P&G] 300 I.U PFP (0.5 mL)	Vitals	16	9	1	0	0	0	2	F	Vitals F	3916.01	No Cons	15	Not Requi
6	SURGEON GOWN ECONOMY (MEDISAFE)	Desired	149	141	185	141	467	15.57	3	F	Desired F	66.5	9.571734	7	-2.57173
7	VAXIFLU-4[ZYDUS] 1 UNIT PFS (0.5 mL)	Vitals	125	14	6	9	29	0.967	3	F	Vitals F	546	129.3103	15	-114.31
8	MENOPUR[FERRING] 1200 IU INJECTION (1 vi	Vitals	2	0	0	0	0	0	0	N	Vitals N	27385.51	No Cons	3	Not Requi
9	GONAL-F[P&G] 450 I.U PFP (0.75 mL)	Vitals	9	5	0	1	0	0	2	F	Vitals F	5838.38	No Cons	15	Not Requi
10	BIVALENT ORAL POLIO[BHARAT] DROP (2 mL	Vitals	5367	186	177	134	497	16.57	3	F	Vitals F	8.83	323.9638	15	-308.964
11	VARIPED[MSD] 1350 PFU INJ (0.5 mL)	Desired	65	184	126	92	402	13.4	3	F	Desired F	1580.8	4.850746	7	2.149254
12	SYNFLORIX[GLAXO] 1 DOSE PFS (0.5 mL)	Essenti	38	10	13	7	30	1	3	F	Essential I	1313.64	38	10	-28
13	TEGADERM 8591 (3M)	Essenti	208	99	97	56	252	8.4	3	F	Essential I	287.6	24.7619	10	-14.7619
14	CETROTIDE[MERCK] 0.25 MG INJECTION (1 via	Vitals	26	12	4	0	0	0	2	F	Vitals F	1301.56	No Cons	15	Not Requi
15	FLUQUADRI[SANOFI] 1 DOSE PFS (0.5 mL)	Vitals	49	106	31	0	0	0	2	F	Vitals F	682.5	No Cons	15	Not Requi
16	GARDASIL[MSD] 1 UNIT PFS (0.5 mL)	Essenti	34	25	24	20	69	2.3	3	F	Essential I	2722.72	14.78261	10	-4.78261
17	PREMICATH 28G-1FR [1261.20] (VYGON)	Vitals	6	2	0	2	0	0	2	F	Vitals F	4893.12	No Cons	15	Not Requi
18	PARIETEX COMPOSITE MESH [PCO15FX] 15CM	Vitals	1	0	0	0	0	0	0	N	Vitals N	28116	No Cons	3	Not Requi
19	ROTAVAC 5D[BHARAT] 1 UNIT PFS (0.5 mL)	Desired	2	122	120	88	330	11	3	F	Desired F	470	0.181818	7	6.818182
20	TYPHIBEV[BIOLOGICAL] 25 MCG PFS (0.5 mL)	Vitals	79	20	24	26	70	2.333	3	F	Vitals F	631.54	33.85714	15	-18.8571
21	ANTI-D 150[BHARATH] 150 MCG PFS (1 mL)	Vitals	14	0	2	1	0	0	2	F	Vitals F	1984.83	No Cons	15	Not Requi
22	CUROSURF[CHIESI] 80 MG INJ (1.5 mL)	Vitals	3	1	0	0	0	0	1	S	Vitals S	9002.47	No Cons	7	Not Requi
23	IMMUNOREL[RELIANCE] 5 GRAM INFUSION (	Vitals	3	0	0	0	0	0	0	N	Vitals N	9000	No Cons	3	Not Requi
24	ANTI D 300[BHARATH] 300 MCG PFS (1 mL)	Vitals	9	4	0	9	0	0	2	F	Vitals F	2940.83	No Cons	15	Not Requi
25	NEW BORN BABY DRESS SINGLE (SV APPAREL	Essenti	108	36	78	55	169	5.633	3	F	Essential I	510	19.1716	10	-9.1716
26	GARDASIL 9[MSD] PFS (0.5 mL)	Essenti	9	7	7	3	17	0.567	3	F	Essential I	7898.8	15.88235	10	-5.88235
27	INFANT RESPIRATORY CARE SYSTEM [RT265]	Essenti	7	0	1	0	0	0	1	S	Essential S	3693.12	No Cons	5	Not Requi
28	OROFER S[EMCURE] 200 MG INJ (10 mL)	Vitals	117	14	9	4	27	0.9	3	F	Vitals F	249.04	130	15	-115
29	FOLISURGE[INTAS] 900 I.U INJECTION (1 vial)	Essenti	4	0	0	0	0	0	0	N	Essential I	6232.98	No Cons	2	Not Requi
30	POWD NAN EXCELLA PRO 2[NESTLE] 1 UNIT P	Essenti	42	5	8	2	15	0.5	3	F	Essential I	668.83	84	10	-74
31	ZYVAC T C V[ZYDUS] 1 UNIT PFS (0.5 mL)	Vitals	39	0	0	0	0	0	0	N	Vitals N	582.4	No Cons	3	Not Requi
32	APTAMIL PRETERM[DANONE] 1 UNIT POWDE	Essenti	45	4	1	1	6	0.2	3	F	Essential I	520.38	225	10	-215
33	DUROGESIC[JOHNSON] 25 MCG/HOUR PTCH	Vitals	34	3	1	7	11	0.367	3	F	Vitals F	690	92.72727	15	-77.7273
34	ROTATEQ[MSD] 1 DOSE TUBE (2 mL)	Desired	146	79	93	47	219	7.3	3	F	Desired F	653.16	20	7	-13
35	INOSYS CIRCUIT KIT [BC4110/6110/3110/2110	Vitals	3	0	0	0	0	0	0	N	Vitals N	6229.44	No Cons	3	Not Requi
36	FACE MASK N95 V-4420+ (VENUS)	Essenti	1741	60	79	61	200	6.667	3	F	Essential I	11	261.15	10	-251.15
37	MANFORCE CONDOMS 3'S (MANKINND)	Essenti	800	0	0	0	0	0	0	N	Essential I	22.8	No Cons	2	Not Requi
38	BAKRI POSTPARTUM BALLOON [J-SOS-10050(	Vitals	2	0	0	0	0	0	0	N	Vitals N	8000	No Cons	3	Not Requi
39	DULCOFLEX[SANOFI] 10 MG SUPP (5 supposit	Desired	38	101	73	32	206	6.867	3	F	Desired F	27.63	5.533981	7	1.466019
40	BILIBLANKET PHOTOTHERAPY COVER [6600-0	Essenti	35	15	6	11	32	1.067	3	F	Essential I	636.48	32.8125	10	-22.8125
41	FOLICULIN HP[BHARATH] 150 I.U INJ (1 vial)	Vitals	26	0	0	0	0	0	0	N	Vitals N	585.88	No Cons	3	Not Requi
42	SUSTEN[SUN] 300 MG CAP (10 cap)	Vitals	489	90	30	0	0	0	2	F	Vitals F	28.93	No Cons	15	Not Requi
43	TOSIBAN 37.5 MG[ZUVENTUS] 7.5 MG/1 ML IN	Essenti	7	3	1	4	8	0.267	3	F	Essential I	3252.9	26.25	10	-16.25
44	FERONIA-FCM 500[ZUVENTUS] 500 MG INJEC	Essenti	10	0	6	10	0	0	2	F	Essential I	1387	No Cons	10	Not Requi
45	ORGALUTRAN[ORGANON] 0.25 MG PENFILL (	Vitals	10	5	0	0	0	0	1	S	Vitals S	1384	No Cons	7	Not Requi
46	INTRAOSSEOUS INFUSION NEEDLE 15G -ADJU	Essenti	9	0	0	0	0	0	0	N	Essential I	1533	No Cons	2	Not Requi
47	ET CATHETER WITH STYLET WALLACE	Essenti	7	0	0	0	0	0	0	N	Essential I	1950	No Cons	2	Not Requi
48	NOMOLINE HH ADULT/PEDIATRIC AIRWAY AD	Vitals	10	0	0	0	0	0	0	N	Vitals N	1350	No Cons	3	Not Requi
49	PAMPERS PREMIUM CARE PANTS BABY DIAPI	Essenti	6	0	0	0	0	0	0	N	Essential I	2248.4	No Cons	2	Not Requi
50	INFANRIX HEXA[GLAXO] PFS (0.5 mL)	Vitals	74	68	45	22	135	4.5	3	F	Vitals F	2074.8	16.44444	15	-1.44444

Figure:4.2: Result Table A

51	PORTEX EPIDURAL MINIPACK 18G [100/391/1	Essentia	13	2	6	3	11	0.367	3	F	Essential F	1380	35.45455	10	-25.4545
52	RD SET NEO PT SPO2 [NEONATAL-4004] (MAS	Vitals	17	1	7	5	13	0.433	3	F	Vitals F	1225	39.23077	15	-24.2308
53	NASONEX[MSD] 50 MCG NASAL SPRAY (120 M	Vitals	31	11	7	0	0	0	2	F	Vitals F	407.14	No Cons	15	Not Requi
54	VIREX I I 256[DIVERSEY] DISINFECTANT SOLU	Essentia	5	0	0	0	0	0	0	N	Essential I	2517.5	No Cons	2	Not Requi
55	VASOCLAMP [CORD CLAMP-2460] (POLYMED	Desired	151	114	19	44	177	5.9	3	F	Desired F	3.99	25.59322	7	-18.5932
56	GILSON PIPETTE TIPS INDIVIDUAL WRAPPED	Essentia	593	0	0	0	0	0	0	N	Essential I	20.59	No Cons	2	Not Requi
57	ZINCOVIT[APEX] DROP (15 mL)	Desired	109	62	52	35	149	4.967	3	F	Desired F	39.05	21.94631	7	-14.9463
58	UMBILICAL DOUBLE LUMEN CATHETER 3.5FR (	Vitals	14	2	2	2	6	0.2	3	F	Vitals F	1057.92	70	15	-55
59	INFANT BONNET 22-25CM [BC303-05] (FISHE	Vitals	9	0	0	1	0	0	1	S	Vitals S	1232.64	No Cons	7	Not Requi
60	TUBERVAC[SERUM] 1 MILLION UNITS INJ (1 m	Vitals	130	0	1	0	0	0	1	S	Vitals S	85	No Cons	7	Not Requi
61	NO CODING 1+ BLOOD GLUCOSE TEST STRIPS	Vitals	2101	0	0	0	0	0	0	N	Vitals N	5.25	No Cons	3	Not Requi
62	VALLEYLAB NEONATAL CAUTERY PLATE [E751	Vitals	5	0	0	1	0	0	1	S	Vitals S	2200	No Cons	7	Not Requi
63	Sample Cup - Pcs	Essentia	1	0	0	0	0	0	0	N	Essential I	10983	No Cons	2	Not Requi
64	SUSTEN[SUN] 200 MG INJ (2 mL)	Vitals	70	1	3	2	6	0.2	3	F	Vitals F	163.68	350	15	-335
65	SPINAL NEEDLE 27G WHITACRE [405128] (BD)	Vitals	40	0	5	8	0	0	2	F	Vitals F	273.02	No Cons	15	Not Requi
66	VICRYL 2-0 NW2317 (ETHICON)	Essentia	43	13	12	7	32	1.067	3	F	Essential I	332.69	40.3125	10	-30.3125
67	PRECURCELL PRP KIT (RECUES)	Essentia	6	3	2	0	0	0	2	F	Essential I	1750	No Cons	10	Not Requi
68	MOTIL[ANDRO] TAB (10 tab)	Essentia	290	0	0	130	0	0	1	S	Essential S	35.92	No Cons	5	Not Requi
69	ALTACEF INJ[GLENMARK] 1.5 GRAM INJ (1 via	Essentia	199	0	155	191	0	0	2	F	Essential I	52.25	No Cons	10	Not Requi
70	GESTOFIT SR[ALEMBIC] 300 MG TAB (10 tab)	Essentia	320	190	30	0	0	0	2	F	Essential I	32.44	No Cons	10	Not Requi
71	SURGICEL 2X3 1953 (ETHICON)	Vitals	15	4	3	5	12	0.4	3	F	Vitals F	1151.88	37.5	15	-22.5
72	TRUBARB 0,30CM [BSN0316U] (HEALTHIUM)	Vitals	6	0	0	0	0	0	0	N	Vitals N	1682.76	No Cons	3	Not Requi
73	NITRITE POWDER FREE NITRILE EXAMINATIO	Essentia	5300	0	200	0	0	0	1	S	Essential S	1.9	No Cons	5	Not Requi
74	OSSOPAN D[TTK] ORAL SUSP (200 mL)	Essentia	113	45	37	17	99	3.3	3	F	Essential I	123.63	34.24242	10	-24.2424
75	TEGADERM 1623 (3M)	Essentia	749	340	335	280	955	31.83	3	F	Essential I	22.89	23.5288	10	-13.5288
76	GONAL-F[P&G] 75 IU INJECTION (1 vial)	Vitals	9	14	4	0	0	0	2	F	Vitals F	1088.29	No Cons	15	Not Requi
77	DREAM-MA XT[HEALTHON] TAB (10 tab)	Essentia	150	40	0	120	0	0	2	F	Essential I	63.05	No Cons	10	Not Requi
78	APTAGROW VANILLA BIB[DANONE] 1 UNIT P	Essentia	21	0	1	1	0	0	2	F	Essential I	449.55	No Cons	10	Not Requi
79	GESTOFIT SR[ALEMBIC] 200 MG TAB (10 tab)	Essentia	410	120	30	0	0	0	2	F	Essential I	22.87	No Cons	10	Not Requi
80	POWD NEOLACT MMF PLUS[NEOLACTA] POV	Essentia	40	0	0	0	0	0	0	N	Essential I	232.96	No Cons	2	Not Requi
81	HUMOG HP[BHARATH] 150 I.U INJ (1 vial)	Vitals	29	8	1	3	12	0.4	3	F	Vitals F	401.85	72.5	15	-57.5
82	FIONA[MERIL] 20 MCG/24 HOUR IUD (1 devic	Essentia	8	0	3	0	0	0	1	S	Essential S	1128	No Cons	5	Not Requi
83	BABY BATH TUB (GOKIDZ)	Desired	40	75	9	44	128	4.267	3	F	Desired F	595	9.375	7	-2.375
84	EPICUTANEO CAVA CATHETER 24G-2FR [1284	Vitals	3	0	0	0	0	0	0	N	Vitals N	2975.04	No Cons	3	Not Requi
85	POWD NEOLACT MMF PLUS[NEOLACTA] POV	Essentia	20	0	0	0	0	0	0	N	Essential I	441.93	No Cons	2	Not Requi
86	SMOFLIPID 20%[FRESENIUS] INJ (100 mL)	Vitals	35	5	6	8	19	0.633	3	F	Vitals F	343.9	55.26316	15	-40.2632
87	POWD NAN PRO 2[NESTLE] POWDER (450 gra	Essentia	15	5	7	0	0	0	2	F	Essential I	578.3	No Cons	10	Not Requi
88	VENFLON PRO SAFETY IV CANNULA 22G [393	Vitals	163	49	44	31	124	4.133	3	F	Vitals F	84.91	39.43548	15	-24.4355
89	TOSIBAN 6.75 MG[ZUVENTUS] 7.5 MG/1 ML IN	Essentia	8	0	0	1	0	0	1	S	Essential S	1071.53	No Cons	5	Not Requi
90	NORMOZ-DS[SUN] TAB (10 tab)	Essentia	310	110	90	0	0	0	2	F	Essential I	27.53	No Cons	10	Not Requi
91	BIOGLANDIN[UNITED] 500 MCG INJ (1 vial)	Essentia	2	0	1	0	0	0	1	S	Essential S	4214.22	No Cons	5	Not Requi
92	MOM CARE MATERNITY PAD 7'S (AKRUTI PRO	Essentia	120	0	0	0	0	0	0	N	Essential I	70	No Cons	2	Not Requi
93	DYDROBOON[MANKIND] 10 MG TAB (10 tab)	Essentia	350	0	0	90	0	0	1	S	Essential S	23.75	No Cons	5	Not Requi
94	NEOSEAL S [N421] (NEOTECH)	Vitals	88	0	0	0	0	0	0	N	Vitals N	94	No Cons	3	Not Requi
95	SIMILAC ADVANCE-1[ABBOTT] POWDER (400	Essentia	13	0	0	0	0	0	0	N	Essential I	632.37	No Cons	2	Not Requi
96	SODIUM CHLORIDE 0.9%[AMANTA] 0.9 %W/V	Essentia	1773	319	209	203	731	24.37	3	F	Essential I	5.37	72.76334	10	-62.7633
97	VARILRIX[GLAXO] 1 UNIT INJ (0.5 mL)	Desired	74	22	68	35	125	4.167	3	F	Desired F	1524.64	17.76	7	-10.76
98	FOLISURGE[INTAS] 300 I.U PFP (0.48 mL)	Vitals	17	9	7	12	28	0.933	3	F	Vitals F	2707.5	18.21429	15	-3.21429
99	NEONATAL PICC PLACEMENT KIT [80199.519]	Essentia	5	2	0	1	0	0	2	F	Essential I	1616.64	No Cons	10	Not Requi
100	UMBILICAL PLACEMENT PACK [80199.695] (V	Essentia	3	0	1	1	0	0	2	F	Essential I	2648.64	No Cons	10	Not Requi

Figure 4.2: Result Table B

4.3 Discussions:

All the above tables and figures, finally conclude to results that:

(i) Around **25** line of items shows no consumption pattern and hence shows no movement, thus stock is not required.

(ii) Around **12** line of items, shows Slow Mvement, where consumption pattern is slow and can be ordered depending

upon the requirement, needed sometimes.

(iii) Around **63** line of items shows Fast Movement, which might be in regular use but with the help of VED-FSN Matrix, which items are of most requirement can be mapped out and their stock can be kept in hold for some more days in the inventory and rest can be retured to vendor and can be ordered when required.

(iv) This results and discussion can be applied to inventory for Optimization of Inventory

Chapter 5

Recommendations

Extending as an interpretation to the results shown above, the following inferences are discussed :

The comprehensive analysis conducted using VED (Vital, Essential, Desirable) and FSN (Fast-moving, Slow-moving, Non-moving) methodologies provided valuable insights into the inventory management practices of the hospital. The results indicate significant opportunities for optimization and cost savings. Here are the key findings:

5.1 Key Findings:

1. **Non-Moving Items**:
    - **25 line items** show no consumption pattern, indicating no movement.
    - **Action**: These items are identified as unnecessary for stock. Removing them from inventory can reduce holding costs and free up storage space.
2. **Slow-Moving Items**:
    - **12 line items** display slow movement patterns.
    - **Action**: These items can be ordered based on specific requirements rather than being stocked continuously. This approach reduces excess inventory and minimizes holding costs.
3. **Fast-Moving Items**:
    - **63 line items** are identified as fast-moving, regularly used in hospital operations.
    - **Action**: Through the VED-FSN matrix, the most critical items among these can be pinpointed. Critical items should be kept in sufficient stock to avoid shortages. Non-critical fast-moving items can be returned to the vendor and reordered as needed, reducing unnecessary inventory holding.

Overall Implications:

- **Inventory Optimization**:
    - The application of VED-FSN analysis effectively categorizes inventory items based on their criticality and movement patterns.
    - This categorization aids in prioritizing inventory management efforts, ensuring that critical items are always available, while non-essential items are minimized or ordered on demand.
    - **Cost Savings**:

    - By identifying and removing non-moving items, the hospital can significantly reduce holding costs.
    - Slow-moving items ordered based on need further contribute to cost efficiency.
- **Operational Efficiency**:
    - Fast-moving critical items being kept in stock ensures uninterrupted healthcare services.
    - The strategic return and reorder of non-critical items optimize inventory levels and improve cash flow.

5.2 Conclusion: The findings from this study confirm that the strategic use of VED and FSN analysis in inventory management can lead to significant improvements in stock optimization. By focusing on critical items and adjusting stock levels based on movement patterns, the hospital can achieve a balance between cost efficiency and operational readiness. This approach can serve as a model for other healthcare facilities aiming to optimize their inventory management practices and ensure high-quality patient care.

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THANK YOU