Internship Training

At

AAKASH HEALTHCARE PVT. LTD.
DWARKA, NEW DELHI

PROCUREMENT PLAN OF OPEX ITEMS FOR AN UPCOMING 230 BEDDED HOSPITAL IN DWARKA

By

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PG/15/069

Under the guidance of Dr. Vinay Tripathi

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Rohit Vashisht (PG/15/069)

PGDHHM

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LIST OF ABBREVIATIONS

SCM – Supply Chain Management

CAPEX –Capital Expenditure

OPEX – Operating Expenditure

VED – Vital, Essential, Desirable

ROL – Re-order Level

EHC– Executive Health Checkup

BMW – Biomedical Waste

IP – In Patient

ICU – Intensive Care Unit

NICU – Neo natal ICU

PICU – Pediatric ICU

OPD – Out Patient Department

HK – Housekeeping

CSSD – Central Sterile Supply Department

PTS - Pneumatic Tube System

GDP – Gross Domestic Product

OVERVIEW OF THE ORGANISATION

Aakash Healthcare at Dwarka is the flagship hospital of the Aakash Group, which heralds the group's noble intention to enter the healthcare space. This hospital has been planned and designed as a 230 bedded tertiary care multi-specialty facility and has commissioned 100 beds in the first phase.

The Aakash Hospital is constructed across a sprawling 1.3 acre campus which is 230 bedded having 08 OTs, 70 Medical & Surgical Critical Care, 15 bedded dialysis unit and easily accessible from Delhi, Gurgaon and the Bahadurgarh, Hissar, Bhiwadi and Jind.

VISION

To become the most desired healthcare brand by providing compassionate, caring and world class services with the help of talented team of doctors, professional and latest technology.

MISSION

To achieve highest patient satisfaction index by delivering patient centric, best healthcare services amongst the local and extended community.

CORE VALUES

ICARE

- **Integrity**
- **Compassion**
- **Accountability**
- **Respect**
- **Excellence**

SPECIALITIES

Key Specialities

1. Orthopaedics & Joint Replacement
2. Cardiology & Cardiac Surgery
3. Mother & Child
4. General & Minimal Access Surgery
5. Opthalmology& Refractive Surgery
6. Nephrology

Other Specialities

1. Anaesthesiology & Pain Management
2. Blood Bank & Transfusion Medicine
3. Critical Care
4. Dentistry
5. Dermatology
6. Endocrinology
7. ENT
8. Gastroenterology
9. G I Surgery
10. Hearing & Speech
11. Internal Medicine
12. Interventional Radiology
13. Lab Medicine
14. Medical Oncology
15. Neurology
16. Neuro Surgery
17. Physiotherapy & Rehabilitation
18. Plastic & Cosmetic Surgery
19. Preventive Health Check up
20. Pulmonology
21. Rheumatology
22. Radiology
23. Surgical Oncology
24. Trauma & Emergency (24X7)
25. Urology
26. Vascular & Endo Vascular Surgery

DEPARTMENTAL STACKING PLANNING

S. No.	FLOOR	DEPARTMENTS
1.	Seventh	Kitchen, Cafeteria, EHC, Ophthalmology
2.	Sixth	IPD Wards
3.	Fifth	IPD Wards
4.	Fourth	IPD Wards
5.	Service	Library, Seminar Hall, Admin Office, Dr.'s Office, Dr.'s Lounge, Cafeteria
6.	Third	CCU, Cath Lab, C-Sec OT, OT Complex, LDR, Pre & Post OP
7.	Second	Relative Waiting, PICU, NICU-I, NICU-II, Nursery, ICU, SICU, Medical ICU, Laboratory
8.	First	Dialysis, Endoscopy, Gynecology, Pediatrics, MD Room, NIC, ENT
9.	Ground	OPD, Pharmacy, Cafeteria, International Waiting Lounge, ER Observation, ER-Triage
10..	Basement-1	Radiology, IP Billing, Blood Bank, Fire Pump Room, Parking
11.	Basement-2	Gas Manifold, Pharmacy, Linen & HK Stores, BMS, Data Centre, Mortuary, Change Rooms, PTS Control Room, CSSD, Parking, AC Plant/ Boiler Room
12.	Basement-3	BMW Room, Trash & Linen PTS Room, Parking, AC Plant/Boiler Room

RATIONALE

In recent years, the cost of providing healthcare has soared worldwide. In aggregate, healthcare spending accounts for almost 10 percent of the world's GDP. These costs likely will continue to escalate. As a result, national healthcare systems face spiraling expenses as they seek to provide affordable, high-quality, and universal care services. Hospital supply chains present healthcare systems with a prime opportunity both to mitigate increases in expenses and help improve patient care. The greatest opportunity is for hospitals to transform their supply chains into a vital, collaborative and strategic function.

As such, administrators and clinicians would collaborate on anticipating and ordering all medical and non-medical items, such as drugs, diagnostic machines, gloves, and sheets. This process would curb costs-but also yield more far-reaching benefits, such as creating a system that provides and validates product information and drug specifications and effectiveness. As a result, the supply chain would not only help control escalating costs but also boost efficiency and optimize clinical outcomes.

Creating an advanced, highly mature supply chain involves setting up an inclusive governance structure, implementing robust processes for key functions such as procurement and materials management, and integrating and automating information technology (IT) systems.

This study was conducted with a purpose to ensure seamless delivery of care once the Aakash Healthcare goes live. Bottlenecks from supply chain in delivery of care shall be as close to zero as possible. Supply chain management being the key pole for cost containment helps bring down the Capex (Capital Expenditure) and Opex (Operating Expenditure) cost. This study has not only focused on describing methods to bring down Opex but also suggested some vital methods for the same.

Review of Literature

Inventory management is the supervision of non-capitalized assets (inventory) and stock items. A component of supply chain management, inventory management supervises the flow of goods from manufacturers to warehouses and from these facilities to point of sale. A key function of inventory management is to keep a detailed record of each new or returned product as it enters or leaves a warehouse or point of sale.

S. Gupta et al in the study on "Inventory control in Hospital stores management – An integral approach" suggests the importance of inventory management to bring down the operating and recurring costs. The study also suggested that Inventory control in hospital is very essential in a developing country like India. As resources are limited, it is essential that the existing resources be appropriately utilized. With the existing drug budget, if rational drug use and improved drug management practices are followed, more number of patients can be served. It is essential that health managers use scientific methods to maximize their returns from investment at a minimal cost. Inventory control, a similar term, is the area of inventory management that is concerned with minimizing the total cost of inventory while maximizing the ability to provide customers with product in a timely manner. In some countries, the two terms are used as synonyms.

Thawani *et al* in their study, Economic analysis of drug expenditure in Government Medical College Hospital, Nagpur suggested that Inventory management stresses on cost containment and improved efficiency.

Beier et al "A focus on inventory management practices" throw the light on the criticality of items for hospital functioning and management, adoption and implementing the inventory management techniques to place the order on time to vendors so that there is smooth supply of materials is maintained.

R. Ramanathan "ABC inventory classification with multiple-criteria using weighted linear optimization" in the study classified the materials into A,B and C categories so that monitoring and controlling of the inventory is made easy. The study also focused on implementing of this technique to optimize the inventory related processes. The analysis classifies the items into three categories: the first 10-15% of the items account for approximately 70% of cumulative value (cost) (category A), 20-25% are category B items that account for a further 20% of the cumulative value and the remaining 65-70% are category C items, amounting for 10% of the total value.

Anonymous, "Supply Chain: Cost of goods grab executives' attention. Health Facility Management" suggested the limitation of ABC analysis that it is based only on monetary value and the rate of consumption of the item. In a hospital, an item of low monetary value and consumption may be very vital or even lifesaving. Their importance cannot be overlooked simply because they do not appear in category A.

JK Das et al conducted study on topic "Essentials of Logistics and Equipment Management" discussed the importance of inventory management technique like VED, ABC and ABC-VED Matrix. VED analysis is based on critical values and shortage cost of the item. Based on their criticality, the items

could be classified into three categories: vital, essential and desirable. There could be serious functional dislocation of patient care services in hospital when vital drugs are not available even for a short period. If essential items are not available beyond a few days or a week, the functioning of the hospital can be adversely affected. The shortage of desirable items would not adversely affect patient care or hospital functioning even if shortage is prolonged.

FS Vazet al in his study on "A Study of Drug Expenditure at a Tertiary Care Hospital: An ABC-VED Analysis" told about the classification of items on ABC and VED and forming a Matrix based on categorization of items on to analyze the contribution of the materials in the total value of the inventory. A combination of ABC and VED analysis (ABC-VED matrix) can be gainfully employed to evolve a meaningful control over the material supplies. Category I includes all vital and expensive items (AV, BV, CV, AE, AD). Category II includes the remaining items of the E and B groups (BE,CE, BD). Category III includes the desirable and cheaper group of items (CD).

GENERAL OBJECTIVE:

The objective of the study is to ascertain the number and quantity of non-medical items which need to be procured for commissioning an OPD department of a 230 bedded Hospital, also to devise a phasing plan for the procurement process.

SPECIFIC OBJECTIVE:

1. Quantification of the non-medical items required for the OPD department.
2. Budgeting the entire requirement of non-medical items for OPD.
3. Phasing Plan for procuring the budgeted and planned items.
4. Understanding and implementing the concept of ABC, VED and ABC VED Matrix.

RESEARCH METHODOLOGY:

Study Design:Cross-Sectional Study

Study Area: Aakash Healthcare, Dwarka

Study Population: Hospital staff, Officials ofFinance & Purchase Departmentt. and Vendors

Data Collection tools and techniques:

Tools: Quotations by vendors

List of items required for the initial phase is provided by the end users

Techniques: Requisition forms, ABC VED Analysis & Matrix

Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies. It is said that the ultimate goal of any effective supply chain management system is to reduce inventory (with the assumption that products are available when needed). As a solution for successful supply chain management, sophisticated software systems with Web interfaces are competing with Web-based application service providers (ASP) who promise to provide part or all of the SCM service for companies who rent their service.

Supply chain management flows can be divided into three main flows:

- The product flow
- The information flow
- The finances flow

The product flow includes the movement of goods from a supplier to a customer, as well as any customer returns or service needs. The information flow involves transmitting orders and updating the status of delivery. The financial flow consists of credit terms, payment schedules, and consignment and title ownership arrangements.

There are two main types of SCM software: planning applications and execution applications. Planning applications use advanced algorithms to determine the best way to fill an order. Execution applications track the physical status of goods, the management of materials, and financial information involving all parties.

Some SCM applications are based on open data models that support the sharing of data both inside and outside the enterprise (this is called the extended enterprise, and includes key suppliers, manufacturers, and end customers of a specific company). This shared data may reside in diverse database systems, or data warehouses, at several different sites and companies.

By sharing this data "upstream" (with a company's suppliers) and "downstream" (with a company's clients), SCM applications have the potential to improve the time-to-market of products, reduce costs, and allow all parties in the supply chain to better manage current resources and plan for future needs.

Increasing numbers of companies are turning to Web sites and Web-based applications as part of the SCM solution. A number of major Web sites offer e-procurement marketplaces where manufacturers can trade and even make auction bids with suppliers[9].

1.Quantification of the Non-medical items required for the OPD department

Quantification is a process that involves estimating the quantities of a specific item required to be procured for a specific period of time. Quantification involves the financial requirements needed to purchase the items, human resource capacity, storage capacity, and the capacity of the system to deliver services. The purpose of quantification is to ensure an uninterrupted supply of materials by supplying and re-stocking pipelines, while at the same time avoiding wastages due to overstocking.

The order quantity is the quantity of items that is ordered to be used in one supply period, and it depends on the length of time between orders (i.e. frequency of ordering) and average monthly consumption. If, for example, you place an order every 6 months, the quantity ordered should maintain stocks above the reserve stock level until the next supplies are received i.e. last for 6 months. To calculate the order quantity, in other words how much you need for the supply period, use the formula:

Order quantity = Time between orders x Average monthly consumption

The maximum stock level is the maximum amount of any item you should have in stock at any time. You will usually only have the maximum levels in stock just after receiving a delivery. The maximum level helps to prevent you from over ordering. This level can change over time, so check it regularly and make any necessary adjustments to the stock card and your orders.To calculate the maximum stock level, use the formula:

Maximum level = Reserve stock level + Order quantity for one supply period

The minimum stock level (sometimes called the re-order level) is the stock level that indicates you need to place an order to avoid running short of supplies. The minimum stock level can change over time, so check it regularly and make any necessary adjustments to the stock card and your orders. To calculate the minimum level, use the formula:

Minimum stock level = Reserve stock + Stock used during lead time

Average monthly consumption (AMC) is the average quantity of an item that is issued each month over a period of months. It takes account of seasonal variations in demand and is calculated using the following formula:

$$\text{Average monthly consumption} = \frac{\text{Total quantities issued in the time period}}{\text{Number of months in the time period}}$$

Based on the consumption of the items by the user department, the items are quantified. The consumption of the user department is calculated based on the requisition raised for that material by the department.

Item code	Item Name	Item Description	Manufacturer	Quantity	Date

Table 1.1

All User Departments have given their quantities for all the materials based on their consumption pattern, based on the consumption pattern quantities are procured. Once the hospital go live, consumption pattern for the materials is captured for the three months and then projected for the required number of days.

2. Budgeting the entire requirement of Non-medical items for OPD

The process for the budgeting is as follows:

Quantity Determination – Once the quantity of the items that has to be procured for the given time period is carried out based on the consumption method for that items, the next step is the budgeting.

Budget preparation – Budget is prepared after estimating the demand of the item for the user department and base price (unit price) which the vendor quotes for the material

Item	Unit price	No. of units	Price
			Total price

Table 2.1

On receiving the quantities for materials from all user departments, then quantities are multiplied with the unit price to get the total cost of the materials. After adding the tax and other components into the total price, the amount which comes out is equivalent to the budget for the procurement of material.

Approval of the budget – Once the budget is prepared, it is to be approved by the GM of purchase department, then GM Finance and in the last it is to be approved and signed by the CEO of the organization.

3. Phasing Plan for procuring the budgeted and planned items & Understanding and implementing the concept of ABC, VED and ABC VED Matrix.

Once the budget is prepared for the materials, then vendors are identified that have the product of desired specification and quotations of the material alongwith technical and financial is received and then are compared with the specifications provided by the other vendor.

Vendor Hunting – Vendor specific for the specific items are then identified which has the material of user need.

Quotations – Rate list of the same material is to be invited for the specified material from the different three vendors.

Selection of Vendor –Based on the comparison of the sample material received from the different three vendors only one vendor is selected who fulfills the criteria of price, quality, delivery terms, guarantee & warranty, reputation and reliability.

Time of Delivery

- Legal problems frequently arise in connection with questions of delivery time. The Buyer may be able to avoid some or most delivery problems by specifying in the written agreement or purchase order the delivery dates required. Some companies use a specific provision in the purchase order permitting cancellation or refusal of shipment if the delivery is not made as specified.
- It is clear that if no time is provided in the agreement, the seller is required to deliver within a "reasonable" time. "Reasonable time" depends on all of the pertinent circumstances of the transaction, including the seller's knowledge of the Buyer's delivery requirements, plus prior dealings and practices between the Buyer and seller.

Assessment of Quality of Supplies

- ❖ Adherence to fresh lot i.e. not in six months of the expiry date
- ❖ Storage and transit conditions
- ❖ Compliance to goods return terms maintenance
- ❖ Form of product
- ❖ Accurate labeling

Raising PO – Once the vendor is selected then purchase order is raised to the vendor for the delivery of material.

Receipt of Material:

Entry of invoice /delivery challan /inward gate pass at security counter is mandatory forevery incoming material at hospital for set up & initiating the operations for set up & initiating the operations.

1. Purchase order copy is required at receiving counter along with invoice/delivery-challan.
2. Stores/Receiving team receives goods with inward gate pass.
3. After goods are brought to the Receiving Counter at the stores /receiving team, verification is carried out for quantity and quality if required. Specifications must conform to criteria in the Purchase Order.
4. If the goods are not accepted then returned /rejected items sent with return form back to supplier & copy to purchase team & finance team .Store manager has to maintain register for return stock.
5. If the goods are accepted then stores team prepares duly certified GRN along with invoice either certified by Q.C (if required) or project manager/ COO delegated site lead.
6. Stores team will update the inventory once the stock GRN is received
7. Purchase Manager updates the record & receives GRN/CC, invoice from site lead/project manager.
8. Purchase Manager forwards a copy of P.O, GRN/CC & invoice to finance department.
9. Finance team has to update the purchase journal & the ledger.
10. Finance Manager Makes the payment based on payment terms, checks calculate & match's approved P.O, invoice, GRN/CC and updates the payment record.

ABC Analysis- The ABC analysis is a business term used to define an inventory categorization technique often used in material management. It is also known as "Selective Inventory Control. " Policies based on ABC analysis:

- A ITEMS: very tight control and accurate records
- B ITEMS: less tightly controlled and good records
- C ITEMS: simplest controls possible and minimal records

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost, while also providing a mechanism for identifying different categories of stock that will require different management and controls.

The ABC analysis suggests that inventories of an organization are not of equal value. Thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance.

A items are very important for an organization. Because of the high value of these A items, frequent value analysis is required. In addition to that, an organization needs to choose an appropriate order pattern to avoid excess capacity.

B items are important, but of course less important, than A items and more important than C items. Therefore, B items are intergroup items.

C items are marginally important[10].

Quantity is calculated out for the **Phase one** has been suggested initially for the OPD commissioning and then **Phase two quantities** for Hospital when fully operational.

PHASE 1

S.no.	Items	UNIT RATE	Phase - I Quantity	Total cost	ABC Analysis	VED ANALYSIS
1	R - 82 Disinfectant	4200	625.00	2625000.00	A	Vital
3	Laptop	37500	63.00	2362500.00	A	Vital
2	Color TV with Digital Connection	25000	94.00	2350000.00	A	Essential
4	Industrial Roll	1232	1250.00	1540000.00	A	Essential
5	Blanket	900	1125.00	1012500.00	A	Vital
7	Patient Rights & Responsibilities Signages	15000	63.00	945000.00	A	Vital
6	Chemicals	5000	188.00	940000.00	A	Vital
8	Tie Pin	300	2500.00	750000.00	A	Desirable
9	File/Folder of hospital Branding	50	12500.00	625000.00	A	Vital
10	Key Chains with Logo	200	3125.00	625000.00	A	Desirable
11	Bin Trolley 1100 ltr	20000	29.00	580000.00	A	Vital
12	Nursing/ Technician Scrub	400	1250.00	500000.00	A	Vital
13	BREATHING APPARATUS	78000	6.00	468000.00	A	Vital
14	Flask 1.2 ltr	1200	375.00	450000.00	A	Essential
15	Surgeon Gown	650	688.00	447200.00	A	Vital
16	Baby Swadel Sheet	700	625.00	437500.00	A	Vital
17	Foam Soap	675	625.00	421875.00	A	Desirable
18	Pillow Protector	300	1250.00	375000.00	A	Essential
19	TRAFFIC CONES	3000	125.00	375000.00	A	Vital
20	Temperature Recorder for Domestic Refrigerator	8711	38.00	331018.00	A	Vital
21	Moisturizer	500	625.00	312500.00	A	Essential
22	Pillow Firm	1000	250.00	250000.00	A	Essential
23	Files/ Holders	400	625.00	250000.00	A	Vital
24	Tissue Packet 50 pull	285	875.00	249375.00	A	Essential
25	Slipper	399	625.00	249375.00	A	Essential

26	EHC Dress Male	600	375.00	225000.00	B	Vital
27	Mothers Gown	600	375.00	225000.00	B	Vital
28	SS Dustbins 15 ltr with dome	1789	125.00	223625.00	B	Vital
29	Nursing Uniform Female	550	375.00	206250.00	B	Vital
30	Baby Blanket	550	375.00	206250.00	B	Vital
31	Navy Blue Blazer	800	250.00	200000.00	B	Vital
32	Nehru Coat Sleeveless	790	250.00	197500.00	B	Desirable
33	Sweater Cardigan (Grey)	780	250.00	195000.00	B	Desirable
34	Printer	4366	44.00	192104.00	B	Vital
35	Bath Towel	500	375.00	187500.00	B	Vital
36	Sweater Cardigan (Blue)	750	250.00	187500.00	B	Essential
37	Air Freshner Automatic	2000	88.00	176000.00	B	Essential
38	Safari Suit Grey	668	250.00	167000.00	B	Desirable
39	Sweater Pullover (Blue)	660	250.00	165000.00	B	Desirable
40	EHC Dress Female	650	250.00	162500.00	B	Vital
41	Wall Clock Brown Frame	250	625.00	156250.00	B	Desirable
42	Wall Clock Silver Frame	250	625.00	156250.00	B	Desirable
43	Bin Trolley 660 ltr	8000	19.00	152000.00	B	Vital
44	Sweater Pullover (Grey)	600	250.00	150000.00	B	Desirable
45	QUE MANAGERS	2350	62.50	146875.00	B	Vital
46	Baby Onesie	450	312.50	140625.00	B	Vital
47	Navy Blue Trouser	550	250.00	137500.00	B	Vital
48	Patient Dress	210	625.00	131250.00	B	Vital
49	Tissue paper holder	350	375.00	131250.00	B	Desirable
53	Digital Room Temperature Recorder	14000	9.00	126000.00	B	Vital
50	Pillow Compressed polyphill	500	250.00	125000.00	B	Essential
51	Dustbin White 15lt Nayasa	500	250.00	125000.00	B	Vital
52	Sky Blue Shirt (Chinese Coller)	500	250.00	125000.00	B	Vital
54	Doctors Scrub	191	625.00	119375.00	B	Vital
55	Sky Blue Shirt	450	250.00	112500.00	B	Vital

56	Outsource Scrub	250	438.00	109500.00	B	Vital
57	Nursing Shoes (Female)	550	188.00	103400.00	B	Vital
58	Anti skid mats Bathroom	550	188.00	103400.00	B	Vital
59	Nursing Shoes (Male)	550	188.00	103400.00	B	Vital
60	Crocs	1000	88.00	88000.00	C	Vital
61	Vegetable crates Multipurpose 22 liters	2700	32.00	86400.00	C	Essential
62	Envirojan refill	450	190.00	85500.00	C	Essential
63	Nursing Uniform Male	450	190.00	85500.00	C	Vital
64	Microwave Oven (22 Lit)	4490	19.00	85310.00	C	Vital
65	Kitchen Roll	220	375.00	82500.00	C	Essential
66	Baby Bedsheet	400	188.00	75200.00	C	Essential
67	Bill Folder	600	125.00	75000.00	C	Vital
68	Doctors Coat Male	395	188.00	74260.00	C	Vital
69	Shaving kit	765	94.00	71910.00	C	Vital
70	Doctors Coat Female	350	188.00	65800.00	C	Vital
71	Bread Box	100	627.00	62700.00	C	Vital
72	Shampoo / Shower gel	200	313.00	62600.00	C	Essential
73	Name Plate of Doctor	500	125.00	62500.00	C	Essential
74	Dustbins 120 ltr	850	70.00	59500.00	C	Vital
75	Sponge Towel	200	282.00	56400.00	C	Essential
76	Blue Cardboard	450	125.00	56250.00	C	Desirable
78	File Cabinet	4000	13.00	52000.00	C	Vital
79	Casio Label printer with 18mm cartridges	12990	4.00	51960.00	C	Vital
77	Bucket	400	125.00	50000.00	C	Essential
83	TROLLEY	7000	7.00	49000.00	C	Vital
81	Glass Holder	1500	32.00	48000.00	C	Essential
80	Hand Towel	250	188.00	47000.00	C	Vital
82	Bathroom Stool	250	188.00	47000.00	C	Essential
84	Patient HandBook	1550	25.00	38750.00	C	Vital
88	Double Foot rest	1998	19.00	37962.00	C	Desirable
85	Pediatric Dress	150	250.00	37500.00	C	Vital
86	Patient Gown	100	375.00	37500.00	C	Vital
87	Disposable Glasses	2	18750.00	37500.00	C	Vital
94	SS Trolley	8000	4.00	32000.00	C	Vital
91	Baby Cap	100	313.00	31300.00	C	Essential

89	Plastic Hangers	25	1250.00	31250.00	C	Desirable
90	Tie	125	250.00	31250.00	C	Vital
92	Green Cloth (90")	250	125.00	31250.00	C	Vital
93	Saree	250	125.00	31250.00	C	Essential
95	White Board	1500	19.00	28500.00	C	Essential
96	Hospital Letter Head	1.5	18750.00	28125.00	C	Vital
97	TRAFFIC JACKET	700	38.00	26600.00	C	Essential
98	Coaster	2	12500.00	25000.00	C	Essential
99	Green Cloth (60")	200	125.00	25000.00	C	Vital
100	Flite Slipper	200	125.00	25000.00	C	Vital
101	Blouse	200	125.00	25000.00	C	Essential
102	TORCH RECHARGEABLE	1000	25.00	25000.00	C	Vital
103	Envelope (Large/medium/small)	2.5	9375.00	23437.50	C	Vital
104	Pharmacy Envelope (medium/Large/Small)	2.5	9375.00	23437.50	C	Vital
105	MEGAPHONE	3550	6.00	21300.00	C	Vital
106	Heater	3500	6.00	21000.00	C	Desirable
107	Pharmacy Crates	670	31.00	20770.00	C	Vital
108	Dental kit	2290	9.00	20610.00	C	Vital
109	Soap	30	625.00	18750.00	C	Vital
110	Sharp Container	150	125.00	18750.00	C	Vital
111	Ice Box	1400	13.00	18200.00	C	Vital
114	Cake knife	3828	4.00	15312.00	C	Essential
112	Mortuary Sheet (in mtrs)	120	125.00	15000.00	C	Vital
113	TRAFFIC BATONS	600	25.00	15000.00	C	Vital
115	Petticoat	100	125.00	12500.00	C	Essential
116	RAIN COAT	400	31.00	12400.00	C	Desirable
117	Glass base SS top mini cheffing dish	900	13.00	11700.00	C	Essential
118	Notice Board	900	13.00	11700.00	C	Vital
119	Soft Board Pin	35	313.00	10955.00	C	Essential
122	Bread Display with ACR Cover	3500	3.00	10500.00	C	Vital
120	Wheel Barrow	2500	4.00	10000.00	C	Vital
121	SEARCH LIGHT RECHARGEABLE	750	13.00	9750.00	C	Vital

124	Envelope (Large/Small)	3	3125.00	9375.00	C	Vital
123	Paper Rim	230	38.00	8740.00	C	Vital
127	Bakery Moulds	1200	7.00	8400.00	C	Essential
128	Labeling Machine	2790	3.00	8370.00	C	Vital
126	Pop Up toaster	1000	8.00	8000.00	C	Essential
125	PHARMACY MANNUAL BILL BOOK	250	31.00	7750.00	C	Vital
129	Cutlery Stand	1800	4.00	7200.00	C	Essential
131	Door Mats	157	38.00	5966.00	C	Essential
130	Cake pick	990	6.00	5940.00	C	Essential
132	Emergency Light-Portable	900	6.00	5400.00	C	Vital
133	Comb	85	63.00	5355.00	C	Desirable
135	Fruit Baskets	400	13.00	5200.00	C	Essential
138	Heavy duty Laser Thermometer	1725	3.00	5175.00	C	Vital
134	Hydralic Freelance Flask (1.5 lit)	829	6.00	4974.00	C	Vital
136	CAUTION TAPE	250	19.00	4750.00	C	Vital
137	Wooden Hanger	70	63.00	4410.00	C	Desirable
139	Plastic Drug Container Medium	320	13.00	4160.00	C	Vital
140	Coat Hanger – Stand	40	88.00	3520.00	C	Desirable
141	BMW Garbage Bag	5	625.00	3125.00	C	Vital
142	Ironing Board	700	4.00	2800.00	C	Vital
143	Pamphlet Rack for FAQ	400	6.00	2400.00	C	Vital
144	Dry Iron	600	4.00	2400.00	C	Vital
145	KEY RACK	600	4.00	2400.00	C	Desirable
146	Cake Stand	510	4.00	2040.00	C	Essential
147	Water Dispenser	150	13.00	1950.00	C	Vital
148	Steel Tray	350	4.00	1400.00	C	Vital
149	Pen Stand	70	13.00	910.00	C	Desirable
150	Blood Bank Stamp	200	1.00	200.00	C	Vital
151	Biohazard Stamp	200	1.00	200.00	C	Vital
152	Stickers, Charts	5	6.00	30.00	C	Desirable
				27462286.00		

Table. 3.1

ABC ANALYSIS PHASE 1

Category	No. of items	% of items	Value	% Value
A	25	16.44	19471843	70.90
B	34	22.36	5370804	19.55
C	93	61.18	2619639	9.57

Table.3.2

VED Analysis attempts to classify the items used into three broad categories, namely Vital, Essential, and Desirable. The analysis classifies items on the basis of their criticality requirement for the Hospital.

- **Vital:** Vital category items are those items without which the production activities or any other activity of the company, would come to a halt, or at least be drastically affected.
- **Essential:** Essential items are those items whose stock – out cost is very high
- **Desirable:** Desirable items are those items whose stock-out or shortage causes only a minor disruption for a short duration in the production schedule. The cost incurred is very nominal.

VED ANALYSIS FOR PHASE 1

Category	No. of items	% of items	Value	% Value
V	92	60.5	16989961	61.86
E	38	25	7181713	26.15
D	22	14.5	3290612	11.98

Table.3.3

PHASE 2

S.no.	Items	Unit Rate	Phase - II Quantity	Total Cost	ABC Analysis	VED Analysis
1	R - 82 Disinfectant	4200	1313.00	5514600	A	Vital
2	Color TV with Digital Connection	25000	198.00	4950000	A	Essential
3	Laptop	37500	132.00	4950000	A	Vital
4	Industrial Roll	1232	2625.00	3234000	A	Essential
5	Blanket	900	2363.00	2126700	A	Vital
6	Patient Rights & Responsibilities Signages	15000	132.00	1980000	A	Vital
7	Chemicals	5000	395.00	1975000	A	Vital
8	Tie Pin	300	5250.00	1575000	A	Desirable
9	Key Chains with Logo	200	6563.00	1312600	A	Desirable
10	File/Folder of hospital Branding	50	26250.00	1312500	A	Vital
11	Bin Trolley 1100 ltr	20000	62.00	1240000	A	Vital
12	BREATHING APPARATUS	78000	14.00	1092000	A	Vital
13	Nursing/ Technician Scrub	400	2625.00	1050000	A	Vital
14	Flask 1.2 ltr	1200	788.00	945600	A	Essential
15	Surgeon Gown	650	1445.00	939250	A	Vital
16	Baby Swadel Sheet	700	1313.00	919100	A	Vital
17	Foam Soap	675	1313.00	886275	A	Desirable
18	Pillow Protector	300	2625.00	787500	A	Essential
19	TRAFFIC CONES	3000	263.00	789000	A	Vital
20	Temperature Recorder for Domestic Refrigerator	8711	80.00	696880	A	Vital
21	Moisturizer	500	1313.00	656500	A	Essential
22	Files/ Holders	400	1313.00	525200	A	Vital
23	Pillow Firm	1000	525.00	525000	A	Essential
24	Tissue Packet 50 pull	285	1838.00	523830	A	Essential
25	Slipper	399	1313.00	523887	B	Essential
26	EHC Dress Male	600	788.00	472800	B	Vital
27	Mothers Gown	600	788.00	472800	B	Vital
28	SS Dustbins 15 ltr with dome	1789	263.00	470507	B	Vital
29	Nursing Uniform Female	550	788.00	433400	B	Vital

30	Baby Blanket	550	788.00	433400	B	Vital
31	Navy Blue Blazer	800	525.00	420000	B	Vital
32	Nehru Coat Sleeveless	790	525.00	414750	B	Desirable
33	Sweater Cardigan (Grey)	780	525.00	409500	B	Desirable
34	Printer	4366	93.00	406038	B	Vital
35	Bath Towel	500	788.00	394000	B	Vital
36	Sweater Cardigan (Blue)	750	525.00	393750	B	Essential
37	Air Freshner Automatic	2000	185.00	370000	B	Essential
38	Safari Suit Grey	668	525.00	350700	B	Desirable
39	Sweater Pullover (Blue)	660	525.00	346500	B	Desirable
40	EHC Dress Female	650	525.00	341250	B	Vital
41	Wall Clock Brown Frame	250	1313.00	328250	B	Desirable
42	Wall Clock Silver Frame	250	1313.00	328250	B	Desirable
43	Bin Trolley 660 ltr	8000	41.00	328000	B	Vital
44	Sweater Pullover (Grey)	600	525.00	315000	B	Desirable
45	QUE MANAGERS	2350	132.00	310200	B	Vital
46	Baby Onesie	450	657.00	295650	B	Vital
47	Navy Blue Trouser	550	525.00	288750	B	Vital
48	Patient Dress	210	1313.00	275730	B	Vital
49	Tissue paper holder	350	788.00	275800	B	Desirable
50	Digital Room Temperature Recorder	14000	20.00	280000	B	Vital
51	Dustbin White 15lt Nayasa	500	525.00	262500	B	Vital
52	Sky Blue Shirt (Chinese Coller)	500	525.00	262500	B	Vital
53	Pillow Compressed polyphill	500	525.00	262500	B	Essential
54	Doctors Scrub	191	1313.00	250783	B	Vital
55	Sky Blue Shirt	450	525.00	236250	B	Vital
56	Outsource Scrub	250	920.00	230000	B	Vital
57	Nursing Shoes (Female)	550	395.00	217250	B	Vital
58	Anti skid mats Bathroom	550	395.00	217250	B	Vital
59	Nursing Shoes (Male)	550	395.00	217250	B	Vital
60	Crocs	1000	185.00	185000	C	Vital
61	Microwave Oven (22 Lit)	4490	41.00	184090	C	Vital
62	Vegetable crates Multipurpose 22 liters	2700	66.00	178200	C	Essential
63	Nursing Uniform Male	450	395.00	177750	C	Vital

64	Envirojan refill	450	395.00	177750	C	Essential
65	Kitchen Roll	220	788.00	173360	C	Essential
66	Baby Bedsheet	400	395.00	158000	C	Essential
67	Bill Folder	600	263.00	157800	C	Vital
68	Doctors Coat Male	395	395.00	156025	C	Vital
69	Shaving kit	765	198.00	151470	C	Vital
70	Doctors Coat Female	350	395.00	138250	C	Vital
71	Bread Box	100	1313.00	131300	C	Vital
72	Name Plate of Doctor	500	263.00	131500	C	Essential
73	Shampoo / Shower gel	200	656.00	131200	C	Essential
74	Dustbins 120 ltr	850	147.00	124950	C	Vital
75	Sponge Towel	200	591.00	118200	C	Essential
76	Blue Cardboard	450	263.00	118350	C	Desirable
77	Casio Label printer with 18mm cartridges	12990	9.00	116910	C	Vital
78	File Cabinet	4000	27.00	108000	C	Vital
79	Bucket	400	263.00	105200	C	Essential
80	Glass Holder	1500	66.00	99000	C	Essential
81	Hand Towel	250	395.00	98750	C	Vital
82	Bathroom Stool	250	395.00	98750	C	Essential
83	TROLLEY	7000	14.00	98000	C	Vital
84	Patient HandBook	1550	53.00	82150	C	Vital
85	Double Foot rest	1998	41.00	81918	C	Desirable
86	Pediatric Dress	150	525.00	78750	C	Vital
87	Patient Gown	100	788.00	78800	C	Vital
88	Disposable Glasses	2	39375.00	78750	C	Vital
89	SS Trolley	8000	9.00	72000	C	Vital
90	Baby Cap	100	657.00	65700	C	Essential
91	Plastic Hangers	25	2625.00	65625	C	Desirable
92	Tie	125	525.00	65625	C	Vital
93	Green Cloth (90")	250	263.00	65750	C	Vital
94	Saree	250	263.00	65750	C	Essential
95	White Board	1500	41.00	61500	C	Essential
96	Hospital Letter Head	2	39375.00	59062.5	C	Vital
97	TRAFFIC JACKET	700	80.00	56000	C	Essential
98	Coaster	2	26250.00	52500	C	Essential
99	Green Cloth (60")	200	263.00	52600	C	Vital
100	Flite Slipper	200	263.00	52600	C	Vital

101	Blouse	200	263.00	52600	C	Essential
102	TORCH RECHARGEABLE	1000	53.00	53000	C	Vital
103	Envelope (Large/medium/small)	3	19688.00	49220	C	Vital
104	Pharmacy Envelope (medium/Large/Small)	3	19688.00	49220	C	Vital
105	MEGAPHONE	3550	14.00	49700	C	Vital
106	Heater	3500	14.00	49000	C	Desirable
107	Dental kit	2290	20.00	45800	C	Vital
108	Pharmacy Crates	670	66.00	44220	C	Vital
109	Soap	30	1313.00	39390	C	Vital
110	Sharp Container	150	263.00	39450	C	Vital
111	Ice Box	1400	27.00	37800	C	Vital
112	Cake knife	3828	9.00	34452	C	Essential
113	Mortuary Sheet (in mtrs)	120	263.00	31560	C	Vital
114	TRAFFIC BATONS	600	53.00	31800	C	Vital
115	RAIN COAT	400	66.00	26400	C	Desirable
116	Petticoat	100	263.00	26300	C	Essential
117	Glass base SS top mini cheffing dish	900	27.00	24300	C	Essential
118	Notice Board	900	27.00	24300	C	Vital
119	Soft Board Pin	35	657.00	22995	C	Essential
120	Wheel Barrow	2500	9.00	22500	C	Vital
121	Bread Display with ACR Cover	3500	6.00	21000	C	Vital
122	SEARCH LIGHT RECHARGEABLE	750	27.00	20250	C	Vital
123	Paper Rim	230	80.00	18400	C	Vital
124	Labeling Machine	2790	6.00	16740	C	Vital
125	PHARMACY MANNUAL BILL BOOK	250	66.00	16500	C	Vital
126	Pop Up toaster	1000	17.00	17000	C	Essential
127	Envelope (Large/Small)	3	6563.00	16407.5	C	Vital
128	Bakery Moulds	1200	14.00	16800	C	Essential
129	Cutlery Stand	1800	9.00	16200	C	Essential
130	Cake pick	990	14.00	13860	C	Essential
131	Door Mats	157	80.00	12560	C	Essential
132	Emergency Light- Portable	900	14.00	12600	C	Vital

133	Hydralic Freelance Flask (1.5 lit)	829	14.00	11606	C	Vital
134	Fruit Baskets	400	27.00	10800	C	Essential
135	Heavy duty Laser Thermometer	1725	6.00	10350	C	Vital
136	CAUTION TAPE	250	41.00	10250	C	Vital
137	Wooden Hanger	70	132.00	9240	C	Desirable
138	Plastic Drug Container Medium	320	27.00	8640	C	Vital
139	Coat Hanger – Stand	40	185.00	7400	C	Desirable
140	BMW Garbage Bag	5	1313.00	6565	C	Vital
141	Ironing Board	700	9.00	6300	C	Vital
142	Pamphlet Rack for FAQ	400	14.00	5600	C	Vital
143	Dry Iron	600	9.00	5400	C	Vital
144	KEY RACK	600	9.00	5400	C	Desirable
145	Cake Stand	510	9.00	4590	C	Essential
146	Water Dispenser	150	27.00	4050	C	Vital
147	Steel Tray	350	9.00	3150	C	Vital
148	Pen Stand	70	27.00	1890	C	Desirable
149	Comb	85	14.00	1190	C	Desirable
150	Blood Bank Stamp	200	3.00	600	C	Vital
151	Biohazard Stamp	200	3.00	600	C	Vital
152	Stickers, Charts	5	53.00	265	C	Desirable
				57860826.00		

Table. 3.4

PHASE 2

ABC ANALYSIS

Category	No. of items	% of items	Value	% Value
A	24	15.78	40506535	70.00
B	35	23.02	11835195	20.45
C	93	61.18	5519096	9.66

Table. 3.5

VED ANALYSIS

Category	No. of items	% of items	Value	% Value
V	92	60.53	35853889	61.96
E	38	25.00	15097634	26.09
D	22	14.47	6909303	11.94

Table.3.6

ABC VED MATRIX

ABC-VED matrix: The ABC-VED matrix was formulated by cross tabulating the ABC and VED analysis. From the resultant combination three categories were classified (categories I, II and III). Category I was constituted by drugs belonging to AV, AE, AD, BV and CV sub-categories. The BE, CE and BD sub-categories constituted the category II and the remaining drugs in the CD sub category constituted the category III. In the above sub-categories the first alphabet denotes its place in the ABC analysis while, the second alphabet stands for its place in the VED analysis.

PHASE 1

Category	V				E				D			
	No. of items	% of items	Value	% Value	No. of items	% of items	Value	% Value	No. of items	% of items	Value	% Value
A	14	9.21	11898718	43.33	8	5.26	5776250	21.03	3	1.97	1796875	6.54
B	22	14.47	3564054	12.98	3	1.97	488500	1.78	8	5.26	1318250	4.80
C	56	36.84	1527189	5.56	27	17.76	916963	3.34	11	7.24	174587	0.64

Table.3.7

PHASE 2

Category	V				E				D			
	No. of items	% of items	Value	% Value	No. of items	% of items	Value	% Value	No. of items	% of items	Value	% Value
A	14	9.21	25110230	43.40	8	5.26	11622430	20.09	3	1.97	3773875	6.52
B	23	15.13	7516308	12.99	3	1.97	1550137	2.68	8	5.26	2768750	4.79
C	55	36.18	3227351	5.58	27	17.76	1925067	3.33	11	7.24	366678	0.63

Table.3.8

RESULTS AND DISCUSSION

ABC Analysis: Out of the 152 items listed around 16.44% of the materials were found to account for 70.90% of the total cost (25 items) and were classified as A drugs. Another 22.36% of the materials (34 items) consumed 19.55% (B category), while the remaining 61.18% of the materials (93items) accounted for only 9.57% of the total cost (C category).

VED Analysis: 92 items (60.50%) were classified as vital items. Around 38 items (25%) of items were considered as essential, while 22 items (14.50%) were classified as desirable.

There could be serious functional dislocation of patient care when vital items are not available even for short period. Therefore, vital items should always be stocked in sufficient quantity to ensure their constant availability. This group of items must be controlled and monitored with greatest care. The shortage of essential can be tolerated for a short period. If these essential items are not available for a few days or a week, functioning of the hospital can be adversely affected. These items should also be controlled and monitored carefully. The shortage of desirable items would not adversely affect the patient care or hospital functioning even if shortage is prolonged.

ABC-VED Matrix: The distribution of items in various categories of the matrix is as follows

	V	**E**	**D**
A	14(43.33%)	8(21.03%)	3(6,54%)
B	22(12.98%)	3(1.78%)	8(4.80%)
C	56(5.58%)	27(3.34%)	11(0.64%)

	Category I	Strict management control is required
	Category II	Moderate management control
	Category III	Low management control

AV	Comparatively higher inventory, High safety stock and Inventories needs to be monitored on daily basis
AE	High inventory, Low safety stock and inventory can to be monitored periodically (twice/ thrice a week)
AD	Low inventory, no safety stock, inventory can be monitored twice a month
BV	Higher inventory, high safety stock and Inventories needs to be monitored on daily basis
BE	High inventory, Low safety stock and inventory can to be monitored periodically (twice or once a week)
BD	Low inventory, no safety stock, alternative SKU's can be used, inventory can be monitored once a month
CV	Highest inventory, high safety stock and Inventories needs to be monitored on alternate days/ twice a week
CE	Higher inventory, low safety stock and Inventories needs to be monitored on weekly basis
CD	Low inventory, no safety stock, alternative SKU's can be used, inventory can be monitored once a month or once in two months

CONCLUSION

The use of inventory control techniques in the upcoming 230 bedded hospital could help in bringing about substantial improvement not only in patient care but also in form of optimal use of resources.

Also, we can conclude, with the right implementation of key inventory management principles Holding cost, Ordering cost, Inventory cost can be brought down to a minimum. This enables organizations with much more liquidity and hence upscaling their business, growth and expansion potential.

Supply chain management is not only a whistle blower for departments incurring high expenses but also acts as a gate keeper and safeguards the capital of organization. Cost containment is an important vertical of supply chain management and shall be given its due importance.

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