

Internship Training

At

Jaypee Hospital, Noida

**TO DEVISE PURCHASE PLAN OF NON MEDICAL ITEMS FOR AN UPCOMING 250
BEDDED HOSPITAL IN BULANDSHAHR (U.P)**

Partha Jyoti Hatimuria

PG/14/043

Under The Guidance Of

**Mr. Kanishak Gautam
Deputy Manager
(Hospital Operations)**

**Post Graduate Diploma in Hospital and Health Management
2014-16**



International Institute of Health Management Research

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THE CERTIFICATE IS AWARDED TO

Mr. PARTHA JYOTI HATIMURIA

IN RECOGNITION OF HAVING SUCCESSFULLY COMPLETED HIS

INTERNSHIP IN THE DEPARTMENT OF

HOSPITAL OPERATIONS

AND HAS SUCCESSFULLY COMPLETED HIS PROJECT ON

TO DEVISE PURCHASE PLAN OF NON MEDICAL ITEMS FOR AN UPCOMING 250

BEDDED HOSPITAL IN BULANDSHAHR (U.P)

DATE: 1st Feb to 17th May 2016

ORGANIZATION: JAYPEE HOSPITAL, NOIDA

HE CAME OUT TO BE A COMMITTED, SINCERE & DILIGENT PERSON WHO HAS

A STRONG DRIVE & ZEAL FOR LEARNING

WE WISH HIM ALL THE BEST FOR FUTURE ENDEAVORS

Ms. Kavita Vurity
(AGM- HUMAN RESOURCE)



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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Partha Jyoti Hatimuria** student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at Jaypee Hospital, Noida from 01st Feb 2016 to 17th May 2016.

The Candidate has successfully carried out the study designated to his during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.



Dr. A.K. Agarwal

Dean Academics and Student
Affairs

IIHMR, New Delhi



Dr. Preetha. G.S.

Associate Professor

IIHMR, New Delhi

Certificate of Approval

The following dissertation titled “**To devise purchase plan of Non Medical Items for an upcoming 250 bedded Hospital in Bulandshahr (U.P)**” at “**Jaypee Hospital, Noida**” is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name

Signature

Dr. Akhendra
Wadhwa

(Dr. Shakti)
Gupta

Arvind

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Partha Jyoti Hatimuria**, a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. He is submitting this dissertation titled **“TO DEVISE PURCHASE PLAN OF NON MEDICAL ITEMS FOR AN UPCOMING 250 BEDDED HOSPITAL IN BULANDSHAHR (U.P)”** at **“JAYPEE HOSPITAL, NOIDA”** in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.



Dr. Preetha G.S
Dean Academics and Student Affairs
IIHMR, Delhi



17/5/16

Mr. Kanishak Gautam
Deputy Manager
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Jaypee Hospital, Noida



INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,
NEW DELHI
CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **“To map out the Purchase plan of Non Medical Items for an upcoming 250 bedded Hospital in Bulandshahr (U.P)”** and submitted by Partha Jyoti Hatimuria Enrollment No. PG/14/043 under the supervision of Dr. Preetha G.S. for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from 1st February to 17th May 2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

P. J. Hatimuria
Signature
(PARTHA JYOTI HATIMURIA)

FEEDBACK FORM

Name of the Student: Mr. PARTHA JYOTI HATIMURIA

Dissertation Organization: JAYPEE HOSPITAL, NOIDA

Area of Dissertation: HOSPITAL OPERATIONS

Attendance: 100%

Objectives achieved: Dissertation report on cost containment & purchase of non medical items.

Deliverables: Project on material purchase & cost containment.

Strengths: Focused and process oriented approach.

Suggestions for Improvement: Need to brush up on communication skills.

Signature of the Officer-in-Charge / Organization Mentor (Dissertation)



Date: 17/5/16

Place: Jaypee Hospital, Noida

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Partha Jyoti Hatimuria (PG/14/043)

PGDHHM

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Acronyms/Abbreviations:

1. NABH - National Accreditation Board for Hospital & Healthcare Organization provider.
2. GI - Gastro Intestinal.
3. ERCP - Endoscopic Retrograde Cholangiopancreatography.
4. EBUS - Endobronchial Ultrasound.
5. IVF - In Vitro Fertilization.
6. PET CT - Positron Emission Tomography – Computer Tomography.
7. SPECT CT - Single Photo Emission Computer Tomography.
8. CT scan - Computer Tomography.
9. MRI scan - Magnetic Resonance Imaging.
10. OPG - Orthopantomography.
11. OPD - Out Patient Department.
12. VED Analysis - Vital, Essential & Desirable.
13. EOQ - Economic Order Quantity.
14. BOQ - Bill of Quantity.
15. HIS - Hospital Information System.
16. ROP - Re order Point.
17. PO - Purchase Order.
18. GRN - Good Receive Number.
19. PPE - Personal Protective Equipment.
20. AMC - Annual Maintenance Contract.
21. C.C - Completion Certificate.
22. IPD - In Patient Department.
23. BMS - Building Management System
24. CSSD – Central Sterile Supply Department

Part –A: Internship Report

OVERVIEW OF THE ORGANISATION

Jaypee Hospital at Noida is the flagship hospital of the Jaypee Group, which heralds the group's noble intention to enter the healthcare space. This hospital has been planned and designed as a 1200 bedded tertiary care multi-specialty facility and has commissioned 525 beds in the first phase.

The Jaypee Hospital is constructed across a sprawling twenty-five acre campus which has been recently accredited by NABH (National Accreditation Board for Hospital & Healthcare Organization provider) and easily accessible from Delhi, Noida and the Yamuna Expressway.

VISION

Promoting healthcare to the common masses with the growing needs of society by providing quality and affordable healthcare with commitment.

MISSION

The Jaypee Group is committed to building Jaypee Hospital as a super-specialty hospital with advanced healthcare facilities, the latest diagnostic services and state-of-the-art technology focused on medical specialties that meet the healthcare needs of the population. The Jaypee Hospital will be the ultimate choice for medical care.

CORE VALUES

- **Quality:** We shall maintain the highest standards and achieve them by continually measuring and improving outcomes
- **Innovation:** We welcome and encourage change and continuously seek better and more efficient ways to target success
- **Teamwork:** We shall collaborate and share knowledge, for the advancement of our mission
- **Service:** We strive to exceed our patients and fellow colleagues expectations for comfort and convenience
- **Integrity:** We adhere to the highest moral and professional standards of honesty, confidentiality, trust, respect and transparency
- **Compassion:** We adhere to provide a caring and supportive environment for all our patients, their families and fellow colleagues

INSTITUTES & DEPARTMENTS:

1. **Institute of Heart** – Non Interventional Cardiology, Interventional Cardiology, Preventive & Rehabilitative Cardiology, Paediatric Cardiology, Electrophysiology and Devices, Adult Cardiac Surgery, Paediatric Cardiac Surgery, Thoracic Surgery.
2. **Institute of Cancer care** – Surgical Oncology, Medical Oncology, Clinical Haematology, Haematology and Bone Marrow Transplant, Radiation Oncology.
3. **Institute of Bones & Joints** – Joint Replacement, Complex Trauma Service, Arthroscopy and Sports Medicine, Paediatric Orthopaedics, Hand/Shoulder and Ankle Surgery.
4. **Institute of Minimal Access Surgery** – Upper GI Minimal Access Surgery, Hepato Biliary Minimal Access Surgery, Minimal Access Oncosurgery.
5. **Institute of GI & Hepatopancreatobiliary Sciences** – Upper and Lower GI Endoscopy, ERCP, Advanced Biliary Surgery, GI Surgical Oncology, and Bariatric Surgery.
6. **Institute of Solid Organ Transplant** – Kidney Transplant, Liver Transplant.
7. **Institute of Kidney Diseases** – Dialysis & Renal Replacement Therapy, Interventional Nephrology, Endo Urology, Uro Oncology and Paediatric Neurology.
8. **Institute of Brain** – Neurology, Neurosurgery and Paediatric Neurology.
9. **Institute of Spine** – Neuro Spine Surgery, Ortho Spine Surgery, Minimally Invasive Spine Surgery.
10. **Department of Pulmonary, Critical Care & Sleep Medicine** – Bronchoscopy, EBUS, Sleep Lab, Critical Care Medicine.
11. **Institute of Plastic, Aesthetics & Reconstructive Surgery** – Hair Restoration and Transplant, Laser Therapy, Cosmetic Dermatology and Reconstructive Micro Surgery.
12. **Department of Mother & Child** – Antenatal Care, High Risk Obstetrics, Gynaecology, In – Vitro Fertilization (IVF), Gynae – oncology, General Paediatrics, Paediatric Intensive Care and Neonatology & Neonatal Intensive Care.
13. **Department of Internal Medicine** – General Medicine and Infectious Diseases.
14. **Institute of Ophthalmology** – Lasik Laser, Cataract Surgery, Retinal Surgery, Paediatric Ophthalmology & Squint and Oculoplasty Asthetics Ophthalmology.
15. **Department of Ear, Nose & Throat** – Endoscopic Surgery, Microscopic Ear Surgery, Audiology speech Therapy and Hearing Aid.
16. **Department of Dentistry** – General Dentistry, Dental Implants, Paediatric Dentistry and Maxillofacial and Trauma Management.
17. **Department of Nuclear Medicine** – PET CT, SPECT CT and Gamma Camera.
18. **Department of Radiology and Imaging** – General Radiology and Mammography, Ultrasonography, CT Scan, MRI Scan, Bone Densitometry and OPG.
19. **Interventional Radiology** – Neuro Interventional Radiology, GI Interventional Radiology and Peripheral Interventional Radiology.
20. **Department of Transfusion** – 100% Component Therapy, Apheresis, Plasma Exchange and Stem Cell Harvest.

21. Department of Laboratory Medicine – Biochemistry, Haematology & Clinical Pathology, Histopathology & Cytopathology, Microbiology, Immunology and Medical Genetics.

22. Department of Emergency & Trauma.

FLOOR WISE DEPARTMENTAL PLANNING

Sl. No.	FLOOR	DEPARTMENTS
1.	Seventh	Wards
2.	Sixth	Wards
3.	Fifth	Wards
4.	Service	IT Server, AHU, PTS station and MEP
5.	Fourth	OT Complex, ICCU, Cath lab.
6.	Third	Economy Bed, IVF, MICU, SICU, NICU, LDR
7.	Second	Chemotherapy, Cosmetology, Endoscopy, Physiotherapy, Paediatric, Office.
8.	First	Behavioral science, Ortho. , Neuro. , Gen. Surgery/MAS, Pulmonology, Opthal. , Dental, ENT, Diabetes Cardiac.
9.	Ground	Executive Health Check up, Dialysis, Radiology, Day care, Emergency and Trauma, Pharmacy.
10..	Upper basement	Blood Bank, Pathology Laboratory, Nuclear medicine, Kitchen, Administration.
11.	Lower basement	Bio-medical Eng., Radiation Oncology, Laundry, Mortuary, CSSD.

SPREAD OF THE COMPANY

CEMENT

- Jaypee Group is the 3rd largest cement producer in the country. The group produces special blend of Portland Pozzolana Cement under the brand name ‘Jaypee Cement’ (PPC). The company is in the midst of capacity expansion of its cement business in Northern, Southern, Central, Eastern and Western parts of the country and is slated to be 35.90 MnTPA by FY13 (expected) with Captive Thermal Power plants totaling 672 MW

ENGINEERING & CONSTRUCTION

- The Engineering and Construction wing of the Group is an acknowledged leader in the construction of multi-purpose River Valley and Hydropower projects. It has the unique distinction of having simultaneously executed 13 Hydropower projects spread across 6 states and the neighboring country Bhutan for generating 10,290 MW power

SPORTS

- The Group finished the construction and execution of India’s first ever F1 Grand Prix on 30th October, 2011. In addition to F1, the track will also host other top-level international motorsports events from 2012 onwards.

HOSPITALITY

- The Group’s hospitality business owns and operates 6 properties spread across New Delhi, Uttar Pradesh and Uttarakhand. The 4 Five Star Hotels, two in New Delhi and one each in Agra and Missouri have a total capacity of 644 rooms.

EDUCATION

- “People of resources must contribute towards making a better tomorrow for all”. Shri Jaiprakash Gaur ji, Founder Chairman of the Group firmly believes that quality education on an affordable basis is the biggest service which, as a corporate citizen, we can provide.

Education is the cornerstone to economic development and the strength of 1 billion Indians can be channelized by education alone to build India into a developed nation

REAL ESTATE AND EXPRESSWAYS

- The Group is a pioneer in the development of India's first golf centric Real Estate. Jaypee Greens - a world class fully integrated complex consists of an 18 hole Greg Norman Golf Course. Stretching over 452 acres, it also includes residences, commercial spaces, corporate park, entertainment and nature in abundance. Jaypee Greens also launched its second project in Noida in November 2007. India's First Wish Town, is an Integrated Township spread over 1162 acres of land comprising one 18 whole and two 9 whole golf facility & world class residences.

SOCIAL COMMITMENTS

- The Group has always believed in "growth with a human face" and to fulfill its obligations it has set up Jaiprakash Sewa Sansthan (JSS), a 'not-for-profit trust' which primarily serves the objectives of socio – economic development, reducing the pain and distress in society. For over 4 decades now, Jaypee Group has supported the socio-economic development of the local environment in which it operates and ensured that the economically and educationally challenged strata around the work surroundings are also benefited from the Group's growth by providing education, medical and other facilities for local development .

LEADERSHIP TEAM



THE LOGO OF JAYPEE MEDICAL CENTRE:



- **The leaf** represents that we are environment friendly and follow medication safety. The sharp edges and corners represent the modern side (cutting edge technology and world class infrastructure) and the rounded corners represent the patient-care side of Jaypee Medical Centre.

- **The Blue in Jaypee** is identified with Confidence, Credibility and Competence, represents Jaypee Medical Centre's multi-disciplinary capability, cutting edge technology and service foundation built on world-class infrastructure and processes.
- **The Orange** represents the vibrancy, high energy and 'let's make it happen' attitude of our people.
- **The Orange in leaf and Medical Centre** represents that we are a New Life in the group which is supported by Blue Leafs and J of Jaypee Group as pillar of strength.

NETWORK HOSPITALS

The Jaypee Group has extensive plans to expand its healthcare project in the coming years by developing 7 more hospitals:

- A 250 bedded hospital at Bulandshahar
- A 200 bedded hospital at Anupshahar
- A 500 bedded hospital at Sahibabad
- A 500 bedded hospital at Agra
- A 500 bedded hospital at Kanpur
- A 300 bedded hospital at Dehradun
- A 300 bedded hospital at Rewa

Key Learning:

The area of engagement during the internship period was to ascertain the number & quantity of capital non medical items which need to be procured for commissioning an OPD department of a 250 bedded Hospital, also to devise a phasing plan for the procurement process.

During first month of joining I had Induction and orientation in various department of the hospital. Second month I was assigned the task to make the Internal & External signage's for OPD, IPD, Male Ward, Female Ward, Admin Block & Gynae Ward. I was responsible for making internal room numbering as well as EPBAX system for extension line of entire hospital. Forms & Format required for initial stage of an OPD basis. Developing Master Data Sheet for HIS and defining the virtual location of Main & Sub store for various departments for Jaypee Hospital, Bulandshahr.

Reflective Learning:

1. To ascertain the number & quantity of non medical items which need to be procured for commissioning an OPD department of a 250 bedded Hospital, also to devise a phasing plan for the procurement process.
2. Interaction with Project Head Manager, Architect, Store Manager, Store Staff.

Part B: Dissertation

Organization: Jaypee Hospital, Noida

Role: Management Trainee in Hospital Operations.

Task: To devise purchase plan of Non Medical Items for an upcoming 250 bedded Hospital in Bulandshahr (U.P).

ABSTRACT:

Hospital Commissioning and Management services address functional planning and quality assurance issues alongside equipment and maintenance planning and human resource development. Applying concept of well-defined and area specific processes together with transparent financial management and controlling procedures. With projects in multiple locations, have forged valuable partnerships with highly experienced hospital architects and interior designers even at the regional level. This enables us to develop room by room functional plans that follow international hospital planning, facility management and quality management standards, while factoring in the complex regional socio-economic and cultural aspects of hospital commissioning and management.

Starting with assessment of the concept design, functional planning is followed by the development of room loaded detailed planning – all while working in close collaboration with the stakeholders. Aspects which are taken into consideration include: environmentally friendly design, clinical and functional efficiency, up-to-date healthcare technology and IT systems. An implementation master plan is developed establishing a time bound implementation schedule. As standard pre-commissioning activities, we ensure that all necessary systems and protocols are in place and that the hospital has obtained all regulatory approvals and licenses.

Appropriate management capacity is essential in day-to-day operations. To ensure a smooth client handover, we also assume facility management for a time-bound period. Using participatory methods, our expert team coach and mentor the client's management team to develop technical and managerial capacities while providing support to fine tune systems and processes.

Hospital supplies and equipment are dealt with under material management. Supplies are those items that are used up or consumed; hence the term consumable is used for supplies. The supplies in hospital include drugs, surgical goods (disposables, glass wares), chemicals, antiseptics, food materials, stationeries, the linen supply etc. The term equipment is used for more permanent type of article and may be classified as fixed and movables. Fixed equipments is not a structure of the building, but it is attached to the walls or floors, Movable equipment including furniture, instruments; etc.

INTRODUCTION

Managing supplies and equipment involves much more than keeping the storage area neat. The first priority in supply and equipment management knows how to procure the things that are needed. The procurement process involves several steps. First, requirements must be established. The practical nurse manager must maintain ward, clinic, or area readiness by knowing what supplies and equipment are needed for daily operations (to accomplish the mission). The next step is to requisition the supplies and equipment through the proper channels. In order to do this, the manager must have a working knowledge of the basics of the supply system. This does not mean you must be a logistics expert, but you do need to know where to look for information and whom to see for assistance.

When the requested items arrive in your work place, they must be properly received, inspected, and stored. Additionally, supplies and equipment must be properly safeguarded against damage and loss, periodically inventoried and inspected, and properly issued for use. The practical nurse manager is responsible for the readiness of his or her area of responsibility.

Another part of supply and equipment management is maintaining the associated paperwork and records. Hand receipts must be kept up to date, budgets controlled, and supply documents noted and filed. Equipment found to be unserviceable must be turned in or sent for repair. Support of health care operations involves management of the work center itself, in day-to-day operations and in long range planning strategies. Readiness of personnel and equipment must be maintained for efficient operations. To sustain readiness, a paraprofessional in-service program must be developed and implemented. Individual progress and abilities of each subordinate must be tracked and documented. Time schedules and task assignment rosters must be prepared to support daily operations in the work place. The material used for any equipment should be durable, non-corroding, non toxic and safe for use.

a) Departmentalized system: Here the supply of linen for each department of the hospital is marked for that department. The head of the department is responsible for making a linen standard for own department.

b) Centralized linen supply: Under centralized system, linen is issued on exchange basis, that is clean linen is exchanged for soiled linen.

PROBLEM STATEMENT

To commission a 250 bedded secondary care hospital involves inputs and efforts from various disciplines. Supply chain forms an important aspect in the same. To set up an OPD unit, we need to ascertain the following:

- An exhaustive list of commodities to be purchased
- Quantification of all the items.
- Validation of quantities by the process/ department owner.
- Sourcing of items via different vendors.
- Purchase of the listed items.

The real challenge here lies in taking an informed decision as to what all items are vital for the operations and the others which can be avoided. Also, we need to be sure that they are bought in quantities which ensure smooth supply chain management and most importantly do not put undesirable loads on Capital Budget.

Cost containment and appropriate quantification are the two challenges I have tried to address in this project.

AIM:

To devise purchase plan of Non Medical Items for an upcoming 250 bedded Hospital in Bulandshahr (U.P)

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. Understand the practical implications of lead time and raise Purchase orders accordingly.
5. Understand and apply the concept of VED quantities, EOQs and BOQs.

RESEARCH METHODOLOGY:

Study Design: Cross Sectional Study

Study Area: Jaypee Hospital, Bulandshahr

Study Population: Project Head Manager, Depart. Head, Architect, Store Manager, Store Staff

Data Collection technique: One to One discussion

Study period: 1st February to 17th May, 2016

Review of Literature

The work “Inventory” implies the stock of physical goods or commodities.

“An inventory is an idle resource of any kind provided that such a resource has economic value”.

Whether to keep inventories or not? The issue is how much inventories should be kept and how to control it?

To develop a system that would ensure adequacy of stocks at a given time

To ensure that resources are judiciously utilized

To reduce investments in inventory

To avoid stock outs and shortages

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.

EOQ: Economic Ordering Quantity Model (Assumptions and Determination of EOQ)!

One of the important decisions to be taken by a firm in inventory management is how much to buy at a time, or say, for how much inventory to place order at a time. This is called ‘Economic Ordering Quantity.’

Determination of EOQ:

EOQ model is based in Baumol’s cash management model.

How much to buy at a time, or say, how much will be EOQ is to be decided on the basis of the following two costs:

1. Ordering Costs:

It is the cost concerned with the placing of an order to acquire inventories. Yes, it may vary from time to time depending upon the number of orders placed and the number of items ordered in each order. It is also referred to as the ‘cost of acquiring inventories.’

2. Carrying Costs:

It is cost related to carrying or keeping inventories in a firm, examples of carrying costs are interest on investment, obsolescence losses, insurance premium, rent, store-keeping costs, etc. The volume of inventory and carrying costs are positively associated. Larger the former, more will be latter and vice versa. Carrying cost is also called as ‘cost of holding inventories.’

The above two costs are inversely associated. If holding inventory cost increases, ordering cost decreases and vice versa. A balance is, therefore, struck between the two opposing costs and economic ordering quantity is determined at a level for which the aggregate of the two costs is the minimum.

Let us illustrate the two costs with their component

Ordering Costs	Carrying Costs
Requisitioning	Warehousing
Order placing	Handling
Transportation	Administrative
Storing	Insurance
Administrative	Deterioration and Obsolescence

Lead Time: A more conventional definition of lead time in the supply chain management realm is the time from the moment the customer places an order (the moment you learn of the requirement) to the moment it is ready for delivery. In the absence of finished goods or intermediate (work in progress) inventory, it is the time it takes to actually manufacture the order without any inventory other than raw materials.

In the manufacturing environment, lead time has the same definition as that of Supply Chain Management, but it includes the time required to ship the parts from the supplier. The shipping time is included because the manufacturing company needs to know when the parts will be available for material requirements planning. It is also possible for lead time to include the time it takes for a company to process and have the part ready for manufacturing once it has been

received. The time it takes a company to unload a product from a truck, inspect it, and move it into storage is non-trivial. With tight manufacturing constraints or when a company is using Just in Time manufacturing it is important for supply chain to know how long their own internal processes take.

Lead time is made of:

- **Preprocessing Lead Time** (also known as "planning time" or "paperwork"): It represents the time required to release a purchase order (if you buy an item) or create a job (if you manufacture an item) from the time you learn of the requirement.
- **Processing Lead Time**: It is the time required to procure or manufacture an item.
- **Post Processing Lead Time**: It represents the time to make a purchased item available in inventory from the time you receive it (including quarantine, inspection, etc.)

The cost of carrying inventory is used to help companies determine how much profit can be made on current inventory. The cost is what a business will incur over a certain period of time, to hold and store its inventory. The carrying cost of inventory is often described as a percentage of the inventory value. This percentage can include taxes, employee costs, depreciation, insurance, and the cost of insuring and replacing items. There are four main components to the carrying cost of inventory; capital cost, storage space cost, inventory service cost, and inventory risk cost.

ANALYSIS

The following Non Medical item has been required for commissioning an OPD of a Hospital is:

- ✓ **IT (Information Technology)** - Computers, Printers, Telephone, Bar Code printers; etc.
- ✓ **Non Medical Equipments** - Wall Clock, TV, Water Dispenser, Refrigerator, Vending machine for tea/coffee; etc.
- ✓ **Non Medical Furniture** - Consultant Chair, Attendant Chair, three on a Beam waiting chair (for patients), Brochure stand, Office chair, Patient stool, Cupboards, Narcotic Cupboards, white board, shoe rack, Consultant resting bed, attendant resting bed; etc.
- ✓ **Housekeeping Items** - Soap Dispenser, Disinfectant Dispenser, General Dustbin, Water bottle, Glass, Tray, Cleaning carts, PPE, Wheeled Bins set small, Tissue Box; etc.
- ✓ **Miscellaneous Items** - Corner Guard, Wall Guard, Hospital Curtains, Patient & staff Crockery/Cutlery: etc.
- ✓ **Laundry Equipment** - Washing Machine (60)Kg, Dryer Tumbler (30)Kg, Steam Pressure, Hot Pressure, Hand Press, Trolley, SS Tables, Flat bed, Hanger Stand, Mobile Table; etc.
- ✓ **Linen Items** - White Bed Sheet, White Pillow Cover, Pillow, Pillow Proctor, Beige Blanket, Patient Dress Male/ Female, Uniforms, White Hand Towel, White Bath Towel; etc.
- ✓ **Kitchen Items** –
 1. Veg Receiving (Platform Utility Carts, Platform Weighing Scale, Veg Crates, Racks, Vegetables Wash Units; etc.)
 2. Store (Dunnage Racks, Racks, Dairy Refrigerator, Potato & Onion Bins, Furniture as Per Requirement)
 3. Veg Prep Area (Work Table, Vegetable Refrigerator 4 Door, Potato Peeler, Grinder; etc)
 4. Main Kitchen (Garbage Cans, Spreader Tables, Stock Pot Stove, Dough Kneader, Work Table, Four Door Refrigerator, Exhaust Hood; etc)
 5. Pantry (Salamander, Sandwich Griller, Work Table, Double Sink Unit.)
 6. Dish Wash Area (Three Sink, Racks, Soiled Dish Landing Table with Sink, Rack Shelf and Tray Rest Rail; etc)
 7. Patient Food Portioning Area (Clean Dish Landing Table, Patient Food Serving Trolles, Bussing Trolley, Hot Food Counter Bain Marie, Work Table: Etc)
 8. RT feed Section (Racks, Work Table)
 9. Pot Wash (Two Door Refrigerator, Pot wash table with Three Sinks)

10. Staff/Doctor' (Pot Storage Racks, Work Table, Clearance Trolley)

11. Extra (Brain Marie, Water Cooler, Microwave Oven, Water Boiler, Deep Freezer, Idle Maker)

Quantification of Line Items:

Items	Categories	Vital Quantity	Essential Quantity	Desirable Quantity
Computers	IT	40	25	200
Printer		32	10	44
Bar Code Printer		19	16	31
Telephone		88	67	88
Credit/ Debit Card Reader		9	5	15
MS Office		40	25	55
Lotus Notes		40	25	55
AD Server		40	25	55
Antivirus		40	25	55
Adobe		40	25	55
HIS		40	25	55
Wall Clock		Non Medical Equipment	121	25
LED TV	6		4	17
Water Dispenser	11		4	23
Tea/ Coffee Machine	8		5	14
Microwave Oven	6		6	6
Refrigerator (500L)	1		1	10
Refrigerator (320L)	18		10	18
Refrigerator (220L)	18		10	18
Sofa	Non medical Furniture	8	4	37
Side table		3	2	4
Centre Table		2	2	4
Consultant Chair		25	22	25
Attendant Chair		83	44	83
Office Chair		150	100	150
Three on a Beam Waiting		45	58	211
Dining Table		10	4	24

Dining Chair		22	22	43
Discussion Room Table		5	2	9
Consultant Resting Bed		6	5	14
Attendant Resting Bed		57	45	57
Low end Stackable Chair near patient bed		40	40	56
Patient Stool		20	24	67
Shoe Rack		15	18	66
Magzine/ News paper Rack		10	5	16
Brochure Stand		10	6	16
Suggestion Box		18	5	24
Slotted Angle Racks		36	36	56
Cupboard (SS)		7	10	88
Narcotic Cupboard		11	10	11
Footstep		25	51	65
Soap Dispenser	House Keeping Items	131	124	187
Disinfectant Dispenser		50	21	134
Tissue Paper Holder (M Fold Dispenser)		100	100	211
Dustbin General		80	60	143
Dustbin BMW Set Small		80	52	132
Wheeled Bins Set Small (120L)		8	8	100
Dustbin BMW Set (60L)		8	8	100
Linen Hamper With Lid and Wheels 100L (Plastic)		15	21	67
Tissue Box		5	3	45
Sharp Container		68	36	74
Water Bottle		100	63	143
Glass		100	63	167
Tray		45	15	85
Coaster (Cardboard - With Branding)		250	250	385

Bed Pan Hangers		9	5	45
Cleaning Carts		8	8	23
PPE		8	14	43
Measuring Jar		10	10	38
Accessory Holder		13	13	32
Corner Guard	Miscellaneous	221	10	352
Wall Guard		0	0	236
Hospital Curtains		148	56	172
Patient and Staff Crockery/Cutlery		300	300	421
Washer Extractor (60 kg)	Laundry Items	1	1	3
Washer Extractor (30 kg)		1	1	4
Drying Tumbler		1	1	2
Flat Work Ironer (1ROLL)		1	1	2
Laundry Utility Press		1	1	2
Vacuum Finishing Table With Automatic Hand Iron		3	3	5
Compressor		1	1	4
Hand Wash Sink Unit, 458x500 mm		1	1	4
Mobile Wet Linen Hampers, 915x610x765 mm		8	8	28
Mobile Towel Folding Tables, 1800x610x865 mm		1	1	4
Hanger Stand-Single Stack		2	2	12
Platform Weighing Scale 100 Kg		1	1	3
Mobile Tables, 1200x610x865 mm		1	1	5
Eye Wash Station		1	1	1
Platform Utility carts		Kitchen Items	1	1
Veg Crates	12		12	43
Racks	16		16	51
Vegetables Wash Unit (Three Sinks)	1		1	3

Dunnage Racks		8	8	17
Racks		6	6	13
Dairy Refrigerator		2	2	3
Potato And Onion Bins		4	4	8
Furniture As per Requirement		Already Present	Already Present	Already Present
Work Table		Already Present	Already Present	Already Present
Vegetable Refrigerator 4 Door		1	1	3
Potato Peeler		Already Present	Already Present	Already Present
Grinder		Already Present	Already Present	Already Present
Double Sink Unit		1	1	3
Garbage Cans		12	12	23
Tandoor		Already Present	Already Present	Already Present
Spreader Tables		Already Present	Already Present	Already Present
Stock Pot Stove		Already Present	Already Present	Already Present
Two Burner Range		Already Present	Already Present	Already Present
Griddle Plate		1	1	3
Work Table With Sink		Already Present	Already Present	Already Present
Chappati Plate With Puffer		Already Present	Already Present	Already Present
Exhaust Hood		0	0	0
Dough Kneader		1	1	3
Work Table		2	2	6
Four Door Refrigerator		1	1	3
Four Burner Range		1	1	4
Salamander		1	1	2
Sandwich Griller		1	1	3
Work Table		2	2	4
Double Sink Unit		1	1	4
Three Sink		1	1	3

Racks		Already Present	Already Present	Already Present
Soiled Dish Landing Table With Sink		1	1	3
Rack Shelf And Tray Rest Rail		1	1	6
Clean Dish Landing Table		8	8	14
Patients Food Serving Trolles		8	10	23
Bussing Trollry		1	1	3
Hot Food Counter With Bain Marie		Already Present	Already Present	Already Present
Work Table		2	2	4
Racks		2	2	6
Work Table		1	1	4
Two Door Refrigerator		2	2	4
Pot Wash Table With Three Sinks		Already Present	Already Present	Already Present
Pot Storage Racks		2	2	7
Work Table		4	4	8
Clearance Trolley		Already Present	Already Present	Already Present
Brain Marie		2	2	4
Water Cooler		2	2	6
Microwave Oven		3	2	5
Water Boiler		Already Present	Already Present	Already Present
Deep Freezer		Already Present	Already Present	Already Present
Idli Maker		Already Present	Already Present	Already Present
White Bed Sheet	Linen Items	1011	990	471
White Pillow Cover		300	330	438
Pillow		200	330	421
Pillow Proctor		270	330	356
Feeted Sheet		138	84	268
Patient Dress Male		330	330	544
Patient Dress Female		330	330	544
White Hand Towel		330	330	376
White Bath Towel		330	330	453

Uniforms		200	200	358
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Calculation of Linen Requirement:

As per the specific guide line, if the hospital is constructed to serve more than 100 Beds, the linen should be available in **1(Bed):3(Linen)**. For example; if we are serving 10 patients in IPD Ward then we need total 30 set of linen. So, for one bed we required three sets which will include Pillow Cover, Bed Sheet, Feeted Sheet and beige sheet.

Costing of Desirable Items Vs Vital Items:

Items	Categories	Quantity of Vital	Quantity of Desirable	Cost of Unit Item	Cost of Vital	Cost of Desirable	Difference
Computers	IT	40	200	23000	920000	4600000	3680000
Printer		32	44	2000	64000	88000	24000
Bar Code Printer		19	31	11500	218500	356500	138000
Telephone		88	97	500	44000	48500	4500
Credit/ Debit Card Reader		9	15	1000	9000	15000	6000
MS Office		40	55	25000	1000000	1375000	375000
Lotus Notes		40	55	44500	1780000	2447500	667500
AD Server		40	55	60000	2400000	3300000	900000
Antivirus		40	55	1000	40000	55000	15000
Adobe		40	55	1500	60000	82500	22500
HIS		40	55	1000000	40000000	55000000	15000000
Wall Clock	Non Medical Equipment	121	134	320	38720	42880	4160
LED TV		6	17	21100	126600	358700	232100
Water Dispenser		11	23	8663	95293	199249	103956
Tea/ Coffee Machine		8	14	RENTAL	RENTAL	RENTAL	RENTAL
Microwave Oven		6	9	5200	31200	46800	15600
Refrigerator (500L)		1	10	41000	41000	410000	369000
Refrigerator (320L)		18	23	28500	513000	655500	142500
Refrigerator (220L)	18	23	16250	292500	373750	81250	
Sofa	Non medical Furniture	8	37	13875	111000	513375	402375
Side table		3	4	2500	7500	10000	2500
Centre Table		2	4	5500	11000	22000	11000
Consultant Chair		25	25	3500	87500	87500	0
Attendant Chair		83	83	1500	124500	124500	0

Office Chair		150	150	2100	315000	315000	0
Three on a Beam Waiting		45	211	2700	121500	569700	448200
Dining Table		10	24	12000	120000	288000	168000
Dining Chair		22	43	9500	209000	408500	199500
Discussion Room Table		5	9	9500	47500	85500	38000
Consultant Resting Bed		6	14	2500	15000	35000	20000
Attendant Resting Bed		57	63	3000	171000	189000	18000
Low end Stackable Chair near patient bed		40	56	11500	460000	644000	184000
Patient Stool		20	67	3500	70000	234500	164500
Shoe Rack		15	66	2500	37500	165000	127500
Magzine/ News paper Rack		10	16	1080	10800	17280	6480
Brochure Stand		10	16	75	750	1200	450
Suggestion Box		18	24	2500	45000	60000	15000
Slotted Angle Racks		36	56	3600	129600	201600	72000
Cupboard (SS)		7	88	7700	53900	677600	623700
Narcotic Cupboard		11	11	1900	20900	20900	0
Footstep		25	65	2000	50000	130000	80000
Soap Dispenser	HouseKeeping Items	131	187	340	44540	63580	19040
Disinfectant Dispenser		50	134	440	22000	58960	36960
Tissue Paper Holder (M Fold Dispenser)		100	211	200	20000	42200	22200
Dustbin General		80	143	6500	520000	929500	409500
Dustbin BMW Set Small		80	132	300	24000	39600	15600
Wheeled Bins Set Small (120L)		8	100	290	2320	29000	26680
Dustbin BMW Set (60L)		8	100	900	7200	90000	82800

Linen Hamper With Lid and Wheels 100L (Plastic)		15	67	1350	20250	90450	70200
Tissue Box		5	45	3000	15000	135000	120000
Sharp Container		68	74	100	6800	7400	600
Water Bottle		100	143	100	10000	14300	4300
Glass		100	167	36	3600	6012	2412
Tray		45	85	50	2250	4250	2000
Coaster (Cardboard - With Branding)		250	385	150	37500	57750	20250
Bed Pan Hangers		9	45	4	36	180	144
Cleaning Carts		8	23	250	2000	5750	3750
PPE		8	43	12000	96000	516000	420000
Measuring Jar		10	38	5000	50000	190000	140000
Accessory Holder		13	32	200	2600	6400	3800
Corner Guard	Miscellaneous	221	352	350	77350	123200	45850
Wall Guard		0	236	1000	0	236000	236000
Hospital Curtains		148	172	50	7400	8600	1200
Patient and Staff Crockery/Cutlery		300	421	4000	1200000	1684000	484000
Washer Extractor (60 kg)	Laundry Items	1	3	844200	844200	2532600	1688400
Washer Extractor (30 kg)		1	4	207000	207000	828000	621000
Drying Tumbler		1	2	196000	196000	392000	196000
Flat Work Ironer (1ROLL)		1	2	682000	682000	1364000	682000
Laundry Utility Press		1	2	172000	172000	344000	172000
Vacuum Finishing Table With Automatic Hand Iron		3	5	18700	56100	93500	37400
Compressor		1	4	111550	111550	446200	334650
Hand Wash Sink Unit, 458x500		1	4	14000	14000	56000	42000

mm							
Mobile Wet Linen Hampers, 915x610x765 mm		8	28	76000	608000	2128000	1520000
Mobile Towel Folding Tables, 1800x610x865 mm		1	4	27000	27000	108000	81000
Hanger Stand-Single Stack		2	12	20000	40000	240000	200000
Platform Weighing Scale 100 Kg		1	3	34250	34250	102750	68500
Mobile Tables, 1200x610x865 mm		1	5	20000	20000	100000	80000
Eye Wash Station		1	1	15000	15000	15000	0
Platform Utility carts	Kitchen Items	1	4	900	900	3600	2700
Veg Crates		12	43	400	4800	17200	12400
Racks		16	51	480	7680	24480	16800
Vegetables Wash Unit (Three Sinks)		1	3	965	965	2895	1930
Dunnage Racks		8	17	400	3200	6800	3600
Racks		6	13	866	5196	11258	6062
Dairy Refrigerator		2	3	15000	30000	45000	15000
Potato And Onion Bins		4	8	2000	8000	16000	8000
Furniture As per Requirement		Already Present	Already Present	N/A	N/A	N/A	N/A
Work Table		Already Present	Already Present	N/A	N/A	N/A	N/A
Vegetable Refrigerator 4 Door		1	3	18000	18000	54000	36000
Potato Peeler		Already Present	Already Present	N/A	N/A	N/A	N/A
Grinder		Already Present	Already Present	N/A	N/A	N/A	N/A

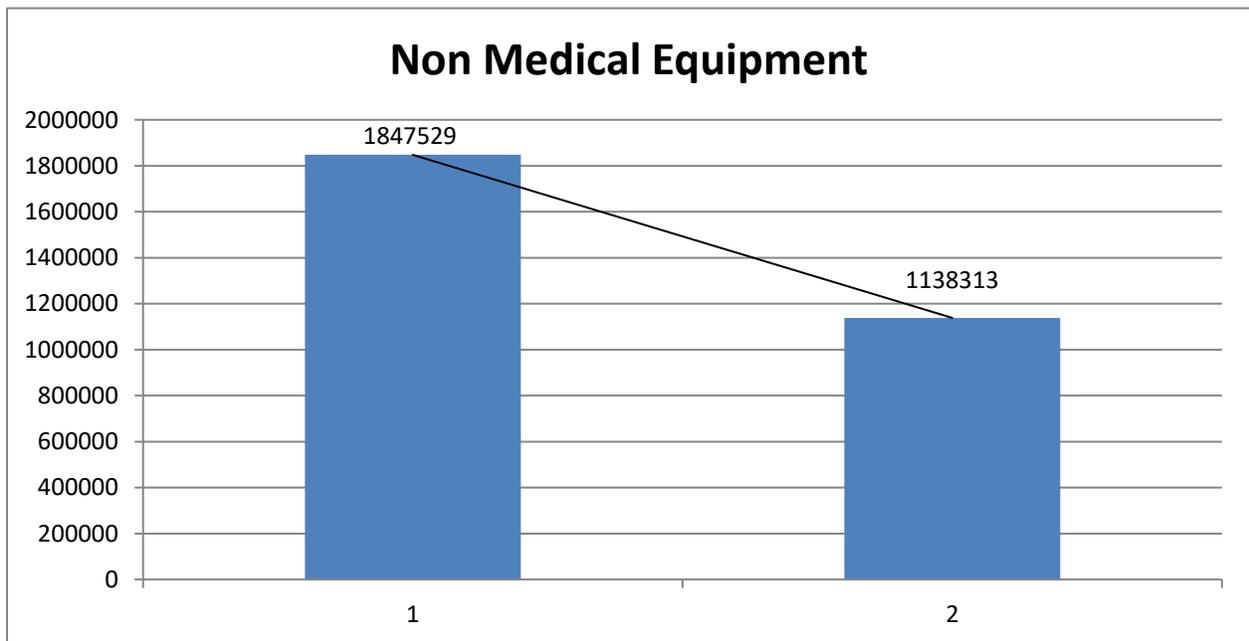
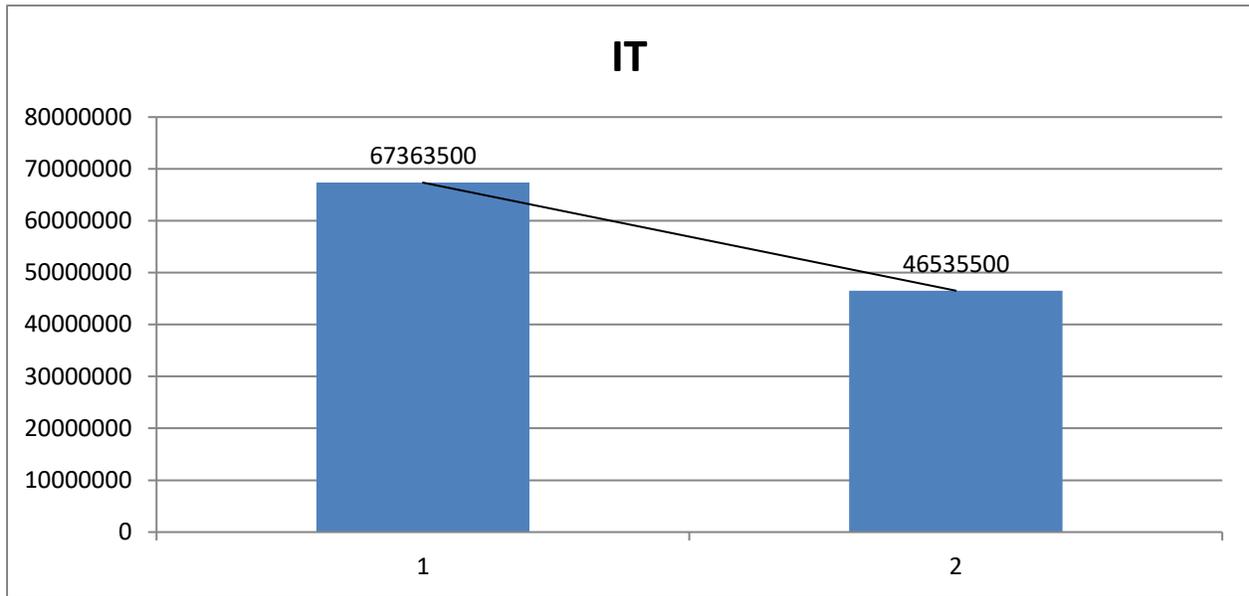
Double Sink Unit	1	3	3000	3000	9000	6000
Garbage Cans	12	23	1700	20400	39100	18700
Tandoor	Already Present	Already Present	N/A	N/A	N/A	N/A
Spreader Tables	Already Present	Already Present	N/A	N/A	N/A	N/A
Stock Pot Stove	Already Present	Already Present	N/A	N/A	N/A	N/A
Two Burner Range	Already Present	Already Present	N/A	N/A	N/A	N/A
Griddle Plate	1	3	780	780	2340	1560
Work Table With Sink	Already Present	Already Present	N/A	N/A	N/A	N/A
Chappati Plate With Puffer	Already Present	Already Present	N/A	N/A	N/A	N/A
Exhaust Hood	0	0	N/A	N/A	N/A	N/A
Dough Kneader	1	3	N/A	N/A	N/A	N/A
Work Table	2	6	N/A	N/A	N/A	N/A
Four Door Refrigerator	1	3	N/A	N/A	N/A	N/A
Four Burner Range	1	4	N/A	N/A	N/A	N/A
Salamander	1	2	N/A	N/A	N/A	N/A
Sandwich Griller	1	3	N/A	N/A	N/A	N/A
Work Table	2	4	N/A	N/A	N/A	N/A
Double Sink Unit	1	4	N/A	N/A	N/A	N/A
Three Sink	1	3	N/A	N/A	N/A	N/A
Racks	Already Present	Already Present	N/A	N/A	N/A	N/A
Soiled Dish Landing Table With Sink	1	3	N/A	N/A	N/A	N/A
Rack Shelf And Tray Rest Rail	1	6	N/A	N/A	N/A	N/A
Clean Dish Landing Table	8	14	N/A	N/A	N/A	N/A
Patients Food Serving Trolles	8	23	N/A	N/A	N/A	N/A
Bussing Trolly	1	3	N/A	N/A	N/A	N/A

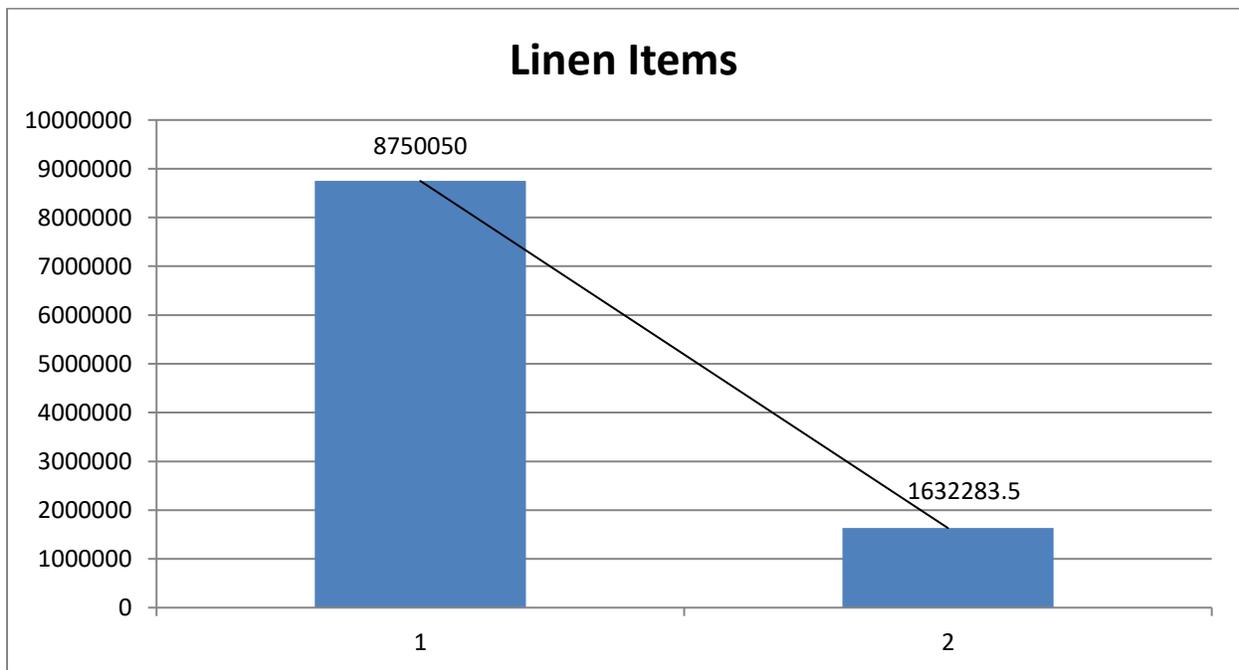
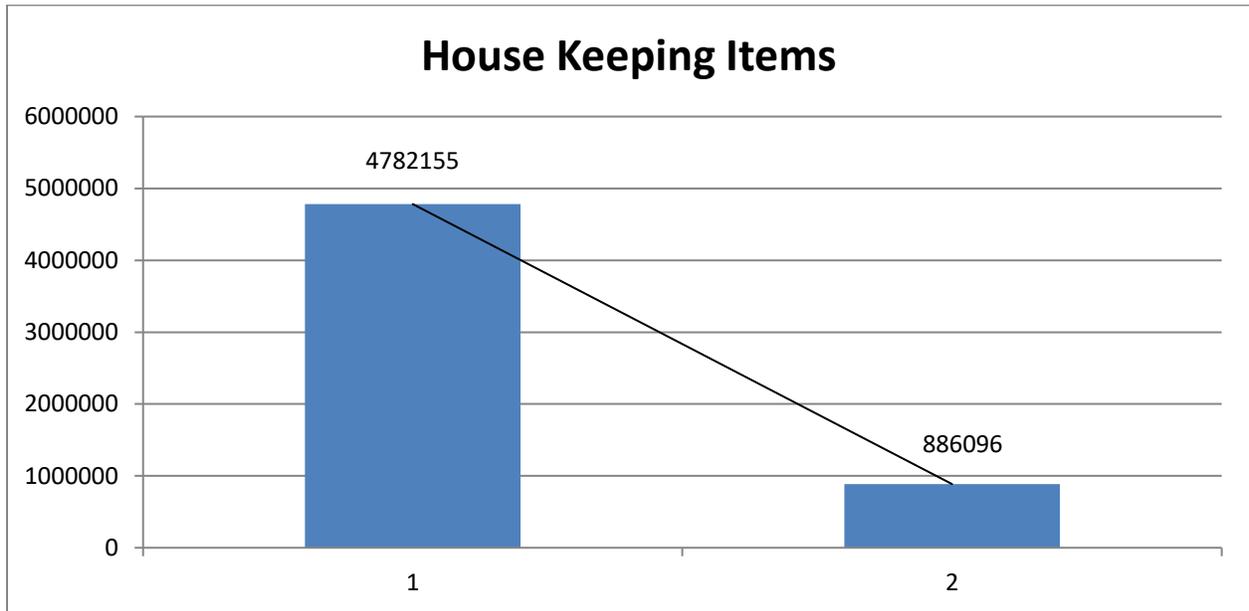
Hot Food Counter With Bain Marie		Already Present	Already Present	N/A	N/A	N/A	N/A
Work Table		2	4	N/A	N/A	N/A	N/A
Racks		2	6	N/A	N/A	N/A	N/A
Work Table		1	4	N/A	N/A	N/A	N/A
Two Door Refrigerator		2	4	N/A	N/A	N/A	N/A
Pot Wash Table With Three Sinks		Already Present	Already Present	N/A	N/A	N/A	N/A
Pot Storage Racks		2	7	N/A	N/A	N/A	N/A
Work Table		4	8	N/A	N/A	N/A	N/A
Clearance Trolley		Already Present	Already Present	N/A	N/A	N/A	N/A
Bain Marie		2	4	N/A	N/A	N/A	N/A
Water Cooler		2	6	16000	32000	96000	64000
Microwave Oven		3	5	14500	43500	72500	29000
Water Boiler		Already Present	Already Present	N/A	N/A	N/A	N/A
Deep Freezer		Already Present	Already Present	N/A	N/A	N/A	N/A
Idli Maker		Already Present	Already Present	N/A	N/A	N/A	N/A
White Bed Sheet	Linen Items	1011	1388	347	350311.5	480942	130630.5
White Pillow Cover		300	438	71	21420	31273.2	9853.2
Pillow		200	421	203	40500	85252.5	44752.5
Pillow Protector		270	356	158	42525	56070	13545
Feeted Sheet		138	268	189	26082	50652	24570
Patient Dress Male		330	544	1250	412500	680000	267500
Patient Dress Female		330	544	675	222750	367200	144450
White Hand Towel		330	376	646	213097.5	242802	29704.5
White Bath Towel		330	453	646	213097.5	292524.75	79427.25
Uniforms		200	358	450	90000	161100	71100

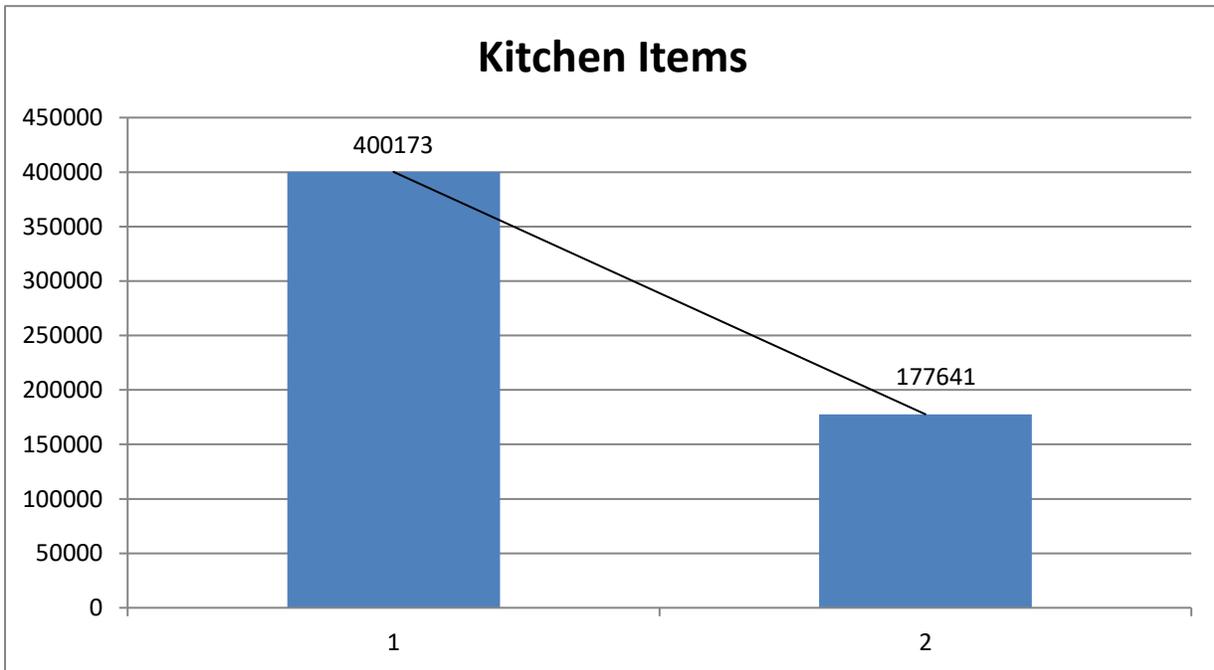
Cost Containment – Vital Vs Desirable Quantities:

Categories	Total Desirable Item cost	Total Vital Item cost	Difference	%
IT	67363500	46535500	20828000	69.08117898
Non Medical Equipment	1847529	1138313	709216	61.61272705
Non Medical Furniture	4782155	2218950	2563205	46.40062901
House Keeping Items	4782155	886096	3896059	18.52921957
Miscellaneous	2051800	1284750	767050	62.61575202
Laundry Items	8406050	3027100	5378950	36.01096829
Kitchen Items	400173	177641	222532	44.39105087
Linen Items	8750050	1632283.5	7117766.5	18.65456197
Total	98383412	56900633.5	41482778.5	57.83559682

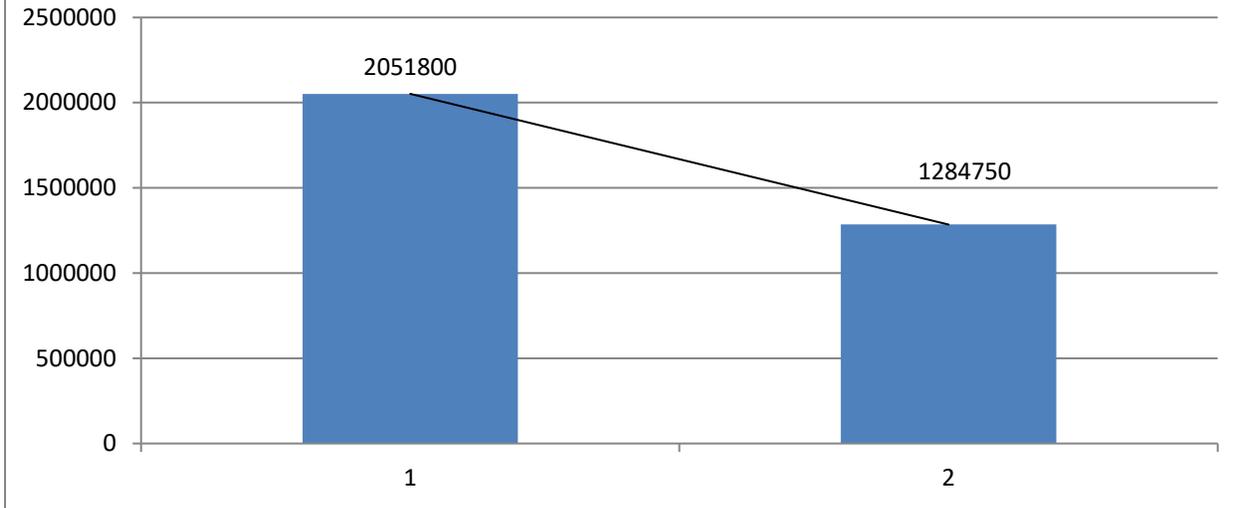
Here, the bar '1' represents Total Desirable Item cost & '2' represents Total Vital Item cost







Micellaneous



Phasing Plan

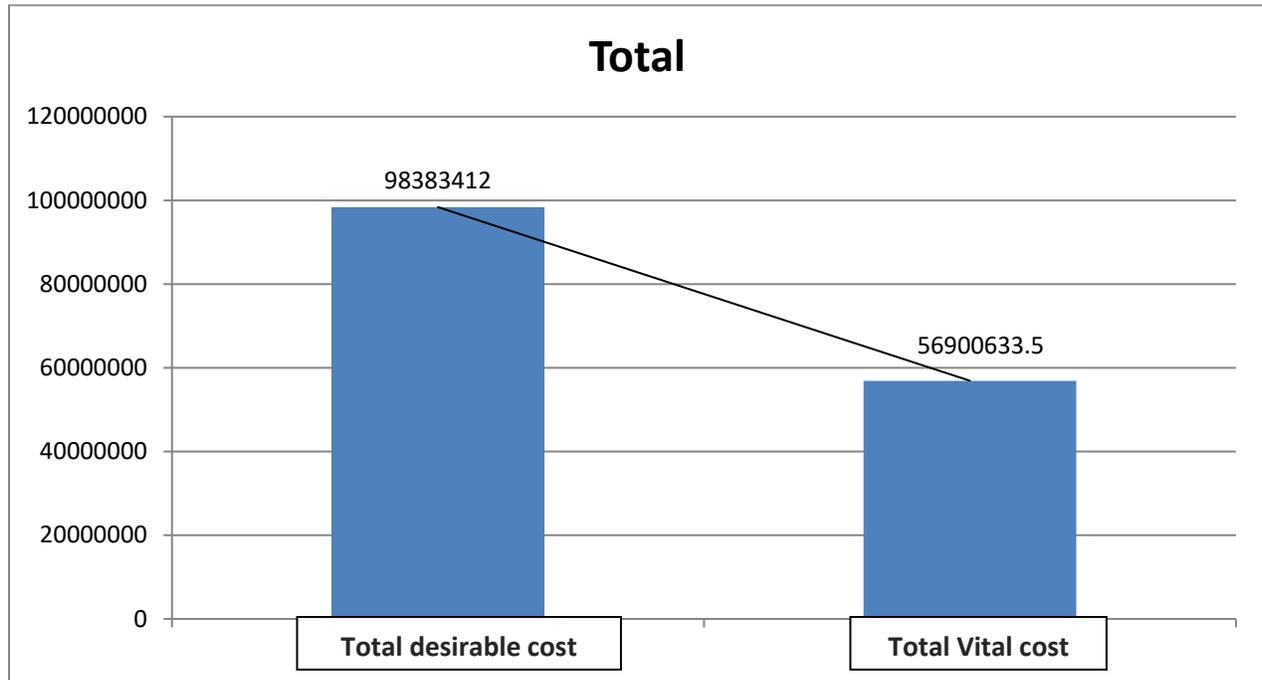
As per the given above Non Medical items the lead time for the various categories are:

CATEGORIES	LEAD TIME
IT	4 – 6 Weeks
Non Medical Equipments	3 – 4 Weeks
Non Medical Furniture	3 – 4 Weeks
House Keeping Items	2 – 3 Weeks
Laundry Equipment	6 Weeks
Kitchen Items	N/A
Linen	3 – 4 Weeks

Here, pre commissioning day zero will be site ready and material availability. Considering the lead time plus installation time plus training time and time required for raising the P.O. The phasing plan of procurement will be decided.

Result:

Total Cost of Desirable quantity Vs Vital quantity:



Here, the total cost of capital expenditure is reduced down to 57% from Total desirable cost to total vital cost. So, our initial budget was Rs. 98383412 Cr which has been cut down to Rs. 56900633.5 Cr by using the application of VED analysis and the remaining budget we can use for planning of purchasing medical item, allocation of human resource, equipments; etc.

Limitation:

1. Newly constructed building, lack of proper storage facilities.
2. Calculations of the EOQ (Economic Order Quantity) are generally done in an ideal basis for specific categories of items.
3. Budgetary and financial issues are coming for commissioning the hospital.
4. Vendor's attitude and casual behavior towards their work.
5. Lack of Coordination between supply chain dep't with the vendors.
6. No assigned store location for keeping Laundry Items.
7. Sudden additional requirements of racks for certain rooms.
8. Current updated drawings are not uploaded in the CAD software.
9. Few ordered items reaches to the corporate office instead of project site, so transportation cost is rising.
10. The lead time for IT & Kitchen item are taking too much time to reach the project site.
11. Lack of coordination between BMS (Building Management System) personnel with the project head of Operations.

Recommendation

- Respective head of the department should ensure that the updates of receiving items in the project site.
- Weekly visit to the site for inspection of the ordered item by the senior personnel.
- More transparency in the time of budget allocation for the project phase.
- Always involve doctors, nurses & other support staffs to give opinion during finalization of item list.

Conclusion:

Our main focus is to reduce down the total inventory cost as well as the cost containment which include taxes, labour cost, transportation cost and other unnecessary expenses. Here, cost-containment analysis is to determine if we are overspending and to find ways to reduce costs during difficult times or to improve profits. This requires us to look at our return on investments in such areas as marketing, hiring employees instead of using contractors and vice versa, buying on credit, negotiating better credit terms or owning building instead of renting.

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