A Framework of Supply Chain and Inventory Management System in Corporate and Service Organization

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Abstract

Whether corporate organization or service organization, all have to be cost conscious. They must spend in inventories very wisely. Consider the fact that the typical manufacturing firm spends, on average, 56 percent of revenue to cover the direct cost of purchased goods, with this percentage figure being even higher for the typical wholesaler or retailer. Add to this figure the indirect cost of having to manage inventory of purchased goods (which has been estimated to be 30-35 percent of the value of purchased goods) and the total cost of purchased goods inventory can be quite alarming. What this means, of course, is that, for any time period, a firm carrying $20 million in purchased goods inventory would, accordingly, incur an additional $6-7 million in material handling and inventory holding costs – direct and indirect costs that, once reduced, can significantly improve the firm's net profits. We should, therefore, not be surprised to learn that firms – from manufacturing to wholesale to retail – are intensifying their search for more efficient and effective inventory management approaches to minimize not only their direct investments in purchased goods inventory but also the indirect cost incurred in managing such inventory. I have chosen these two organizations for the reason that I wanted to compare the inventory management system of two organizations having different back grounds; i.e., a corporate organization with profit motive in mind and the other one which is primarily a nonprofit making with services as the motive. In this paper I would discuss the Inventory Management system followed in corporate setting and a Service Institution (Teaching and Research). This study addresses the overall inventory management system followed at these organizations. The study focuses on understanding and analyzing current inventory system being practiced by them. Further, a set of recommendations to improve the system are also made.

Keywords
Corporate setting, Service organization, Inventory Management, Direct and Indirect costs

1. Introduction
Service Institutes (Teaching and Research) are not as serious as manufacturing enterprise in terms of managing purchase and inventory costs. They in many cases have not been motivated to control purchasing costs in the same way that competitive industry has. Teaching and Research institutions more focus on keeping the consumer more satisfied and comfortable so that their teaching and research activities do not suffer. In this sense, quality of material and timeliness is kept in mind. However, it should not be forgotten that money saved by cutting inventory cost could be used for academic development of the organization. Therefore, while quality material should be provided in time to facilitate the teaching and research activities, minimization of inventory cost must be ensured in Teaching and Research Institutions. As far as Manufacturing organizations are concerned, it would have been possible for a Manufacturing Enterprise in the past to maintain a reasonable margin of profit even if there had been a poor inventory control. But the increasing business and industrial activities call for an effective inventory control system. Moreover, the big size itself calls for more economic operations so as to affect savings thereby driving the advantages of large scale business and industrial operations. (Mishra, 1989) In this paper, it has been observed that the organizations under study have poor ordering and procurement system, poor inventory management, and poor human resource management. To overcome these short comings, some legitimate suggestions are made to improve the system. This study includes two organizations, viz, a Corporate Organization and a Service Institution.

2. Literature Review
Nasiri, et al, (2010) in their study have formulated an integrated model for the location of warehouse, the allocation of retailers to the opened warehouses, and finding the perfect policy for inventory control to managing order quantity and safety stock level. The goal was to select the optimum numbers, locations, capacities of the opening warehouses and inventory policy so that all stochastic customer demands can be satisfied. The model was developed

as a non-linear mixed integer programming and solved using Lagrange relaxation and sub-gradient search for the location/allocation module and a procedure for the capacity planning module. Saeed (2008), has used the trend forecasting to determine ordering policy in supply chains by viewing it as a part of the control process for making the supply responsive to demand. Trend forecasting is often used to assess demand — a tracked variable in the control context, which drives supply — a tracking variable. Used in this way, it is often observed to increase instability creating the so-called bullwhip effect. Trend is used on the other hand with reliability to increase stability in controller control, but with the difference that a trend of a tracking variable is used to drive correction. While both processes involve use of trend to determine policies for achieving reliable performance, the outcomes of the former are variable while those of the later can create improvement in control with certainty. Saeed has discussed the similarities and differences between the two processes and has developed guidelines for applying trend forecasting to enhance stability in supply chains.

Mattsson (2007) in his study has revised and enhanced existing inventory control models in a way that allows them to be used more efficiently in environments with short lead times. Results from the simulation show that traditionally used inventory control methods fail to ensure that desired service levels are attained in environments with short lead times. The simulation also shows that, by using the developed model, the differences between desired and attained service levels can be reduced to fall within limits acceptable in practice. Mohynihan, Bedi R, Pruitt S, (1996) had studied the inventory control situation in the Central Storeroom of The University of Alabama and had developed a Decision Support System for Inventory Control wherein the demand for special projects was communicated by all customer groups to the storeroom. The data was then compiled into an aggregate planned demand schedule for each item. Depending upon the schedule, an appropriate ordering scheme was generated by INFORMM (Integrated System For Materials Management). In the case of a material demand based on the item re-order point listing, INFORMM will utilize the item data (e.g., unit cost, item class, annual demand to provide the decision maker with an inventory analysis. The system is divided into five distinct modules. Module 1 contains the INFORMM database. Module 2 provides system utilities, such as the modification of system variables for what-if analysis. Module 3 deals with planned demand i.e. demand due to special projects. Module 4 addresses the unpredictable demand arising from preventive and corrective maintenance activities on campus. This module also deals with single item and grouped item decisions. Module 5 addresses the disposal of excess stock. The system was developed as a stand-alone entity. Later integration with the main frame-based inventory tracking system was planned.

Literature review of some current results on Inventory management was carried out and it was found that Rajeev (Rajeev, 2008) had made an impressive study of 40 SMEs (small and medium sized enterprises) in Bangalore (India) and he observed that even in an inventory intensive manufacturing industry sector such as the machine tool industry, IM (Inventory Management) practices were poor. The use of formal practices for managing inventories was also inadequate. Poor IM practices were characterized by a lack of an integrated approach in the form of the absence of links between physical stock and accounting system. A lack of appreciation for IM among the entrepreneurs and the lack of qualified staff were the two major factors contributing to low IM practices. This situation was complicated further by other factors such as constraints on working capital, a lack of T&D, a lack of progress in the area of HRD and the organizational characteristics of the SMEs. The use of a formal inventory ordering policy, such as fixed quantity ordering or fixed period ordering policy was not observed in the SMEs. Instead, a random policy was followed by the SMEs for material procurement. The study also identified the use of rule of thumb for IM, a low importance given to forecasting and random ordering for material procurement, low level use of computers and a low level of importance given to purchasing and variable lead-time. Three important aspects used to judge the quality of a firm's IM practices were the systematic character of the operation, the use of computers and the application of modern methodology (Chikan, 1990). In this context, the level of computerization for IM activities in Bangalore was low. While the SMEs were equipped computers, the capabilities of software and hardware were not exploited to their full potential. For the SMEs in the machine tool sector in Bangalore, there is a profound scope for development in IM practices.

In another study, What is the "right" inventory management approach for a purchased item (Wallin et al, 2006**)** have asked an important question – i.e. how best to manage inventory of a purchased item that is critical to the firm? In answering this question, they have offered, as a starting point, the decision framework, one that is conceptually derived from anecdotal data – with the hope that it could not only provide some pragmatic guidance as to how to tackle this question but also augmented existing scientific research on this question. (Kros, Falasca, and Nadler, 2006) in their Impact of just-in-time inventory systems on OEM suppliers, have analyzed the impact of the adoption

of just-in-time (JIT) production systems by different equipment manufacturers (OEMs) on the inventory profiles of their suppliers. (Razi and Tarn, 2003) in An applied model for improving inventory management in ERP system, have provided a simple approach to improving inventory management for spare parts in an ERP environment. The model they have employed uses pooled distribution according to similarities in their demand histories and lead times, which is certainly a feasible and practical alternative to complex theoretical distributions. (Braglia et al, 2004) have designed a Multi-attribute classification method for spare parts inventory management. The spare parts inventories management in industrial plants represents a very complex problem due to the difficulties concerning data collection, the number of factors to be considered, and the large amount of the items involved. A new multi-attribute technique to define the "best" strategies of spare inventories management is presented in their method. (Natarajan, 1991) discussed the linkages between IM and competitive advantage, bringing into focus the integration of strategic and competitive factors such as cost, delivery and quality. (Natarajan, 1991) argues that reducing the throughput time by faster value addition to the materials provides a firm with a distinct edge in competitive environments. However, inventory costs are determined not only by their level of inventory but also by the time the materials spend in the system. (Mantho, 1994) classified IM into three broad areas:

(1) Inventory record keeping: due to the availability of computers at a reasonable price, SMEs have found it appropriate to automate their inventory records through computerization.
(2) Inventory decision-making: many models can be integrated into computer based inventory systems.
(3) Material requirement planning (MRP) system: MRP is an IM information system concerned with getting the right materials to the right place at the right time.

3. Objectives of the Study

The basic objective of this study is to examine / analyze the procurement policies and inventory management system in Corporate Organization and Service Institute (Teaching and Research) and to have practical experience along with theoretical knowledge to appreciate the basic requirement of management study. This type of case study not only widens the information on functioning of an organization, but also highlights the various problems being faced within the organization. This study addresses the overall procurement policies and inventory management system followed in two very important organizations of national importance viz, a Corporate Organization and a Service Institute (Teaching and Research). The study brings out the detailed analysis of purchasing practices and inventory management system followed in the above organizations, the comparison of inventory management system, issues and a set of suggestions. The following methodology was used for the study:

1. Case study method where a Corporate Organization and an Educational Institution selected
2. Multiple field visits, direct interviews and telephonic interactions for data collection
3. Contents analysis and summary of observations
4. Issues , comparison of issues and suggestions

4. Analysis and Discussion

Corporate Organization: This organization is a large manufacturing unit owned by Government of India. This organization is engaged in Mining, Beneficiation, Smelting, Refining and Continuous Cast Rod manufacturing.

Service Institute (Teaching and Research): This is a Teaching and Research Institute owned by Government of India. The aim of the Institute is to provide high standard education in engineering, sciences, humanities, as well as management and to conduct original research of the highest standard. Comparative chart of these two organizations in terms of the Procurement policies and Inventory Management System **are** shown in Table -1**.**

Table 1 Comparative chart

Similarities			
SN	**Issues**	**Corporate Organization**	**Service Institute**
1	Optimization of procurement cost	This organization reduces the cost - Through entering into rate contracts. - Cost reduction by cutting consumption after scrutinizing the indenter's requirement by a well-established Inventory Control Cell. - Through price negotiations. The cost cutting by consumption can be done by cutting on the requirement of the user department, allowing the purchase department to buy it in the Economic lot quantities and then facilitate the	In service institute, cost reduction / cost control is done through - Negotiating the rates. - By purchasing in lot size. -Cost reduction through Freight Forwarder in the case of imported equipments. This institute has its own freight forwarder agent who arranges the delivery from foreign supplier. The equipment is procured on FOB (Free On Board) basis and not on CIF (Cost Insurance and Freight)

		purchase department to negotiate on it.	basis. On comparison, it was found that CIF value through freight forwarder agent was much cheaper than the CIF value arranged by the foreign supplier. Demurrages at port are also avoided through freight forwarder.
2	**Contract Policy**	This organization has in practice the policy of rate contract for many items required for production purposes in order to reduce the procurement cost and time.	This organization too has the similar system as the corporate organization does. Xerox Machines, Air conditioner and Refrigerator under DGS&D (Director General of Supplies & Disposal) rate contract are covered. Chemicals, Computer cartridges etc. are too covered under rate contract.
3	**Training**	People working in Stores / Purchase Department are not trained on materials functions. Training and development is necessary to modify attitudes, knowledge or skill behavior through learning experience to achieve effective performance in an activity or range of activities related to materials functions. It will help the staff to carry out their material functions in a professional manner.	This Institute is also lacking in giving training to its employees on materials functions which has resulted in not following current purchasing and inventory management practices.
4	**Resource management**	Only few people at middle level management are having materials management background. Rest of the employees working in the Stores and Purchase department do not have the materials management background. Many persons from technical departments are placed in Stores and Purchase department who do not have sound knowledge of materials management.	Most of the manpower working in the Stores and Purchase department do not have the materials management degree. The function of the Materials management is a specialized one and therefore, the persons who have the expertise in materials management field should carry it out.
5	**Transactions**	Items at central stores are entered in the receipt register as well as on computers on its receipt. Issues to costumers are made against issue vouchers. After affecting issues, one copy of issue voucher is sent to finance department for costing.	Similar procedure is adopted in this organization also. Issues to customers are made against issue requisition. All issues are entered in the stock ledger. Issues of Consumable items are recorded in stock ledger and non consumables in central asset register and inventories are updated accordingly.
		Differences	
1	**Monitoring**	To monitor proper purchases, an inventory control cell is established that checks for the movement of an item (i.e., whether it is a fast moving, slow moving or non moving in nature). If the item being indented is of slow moving or non moving nature, a detailed justification is sought from the indenting department. This checks the wrong procurement of an item. The Inventory Control Cell also scrutinizes the quantity previously purchased, quantity consumed till date and the balance left.	This organization does not have any inventory control cell that can scrutinize the indent/ demand of an indenting department
2	**Purchasing policies**	All kinds of purchases are done centrally. Consumers send their requirement to purchase department for procurement of the items.	This organization does not follow centralized pattern of purchasing. Here, the system is partially centralized. Major purchases are done centrally through Central Stores & Purchase department. Besides stores & purchase department, other departments do make purchases directly for small value items (for items valuing less than USD 1100.00). Besides the above channels of purchases, the Institute Works Department purchases its works and other building related materials directly.

3.	**Codification**	A 10 digit codification system of the items in store is followed. This system helps in identifying the items in store easily, minimizes many names of a single item and above all, if the item is being procured on single quotation basis, one can find the past purchase prices easily so that reasonable prices of the item are paid.	Codification system is not in practice in this organization. This Institute purchases highly technical equipment frequently. Basically, equipments are procured for research purposes and once the result is achieved, this equipment is almost of no use for another research. Also, due to fast change of the technology, these items become obsolete within very short period and therefore, this Institute does not hold any inventory of such items. Hence, codification system is not adopted.
4	**Repeat Order policy**	Although, the lead-time is very high in this organization, no system followed to repeat the earlier order in spite of the rates and specifications of the item being same.	There is practice to repeat an order within a period of 4 months if the specifications are identical to a purchase order made earlier and the rates are same or less than the earlier rates.
5	**Buying decisions**	Since all purchases are done centrally, it is the Materials Department (central store) that takes decision to procure the stock items. For rest of the items, the purchase department makes purchases on receipt of the indent from the consumers.	Primarily, items are procured for research purposes. Therefore, purchasing at this Institute is user's oriented. Since items/ equipments are of high technicality, user's say is kept in mind while procuring the item/ equipment. Generally, users invite quotations for research related item / material. Quotations are opened in the user's department by the committee duly approved by the competent authority.
6	**Single quotation bounds**	The items / equipment that are proprietary in nature are only allowed to be procured on single quotation basis. There is no provision / monetary limit to procure an item on single quotation.	Cash purchases up to USD1100.00 are made directly by the purchaser on single quotation basis from the market/seller.
7	**Inventory policies**	This organization has selective inventory control techniques in place. To procure A' and 'B' class items, manual reviewing is done on regular basis. As far as 'C' class items are concerned, automatic indenting is done for them. To control the obsolete items whether spare parts, or raw materials or components, FSN classification is adopted in this organization. Items issued and consumed in the last one year are placed in the Fast moving category, items consumed after a year but within three years are placed in the Slow moving category, and items consumed after three years or not consumed at all are placed in the Non moving category.	Here, the inventory decisions are based on the personal judgment, intuition and experience of management. No inventory control technique is in operation. These settings provide a unique area for the application of materials management techniques

5. Observations

5.1. Corporate Organization:

Demand and supply gap: There is a mismatch between demand and supply. The materials department is not able to cater to the demand of the shop floor to their satisfaction due to poor financial health of the organization. This obviously leads to production losses.

Storage of Excess Inventories: A huge excessive inventory is stored at the central stores of this organization. A lot of obsolete inventory is also lying at central stores of this unit. Non-moving inventory to the tune of USD 2000000.00approximately is also lying. This is indeed a serious concern. Blocked inventory results in higher debt and poor working capital resulting in higher financial cost.

Non inclusion of relevant costs: The basic goals of inventory management are to provide customer satisfaction and to reduce the sum of all costs involved. To achieve these objectives, two basic questions must be answered; one, how much should be ordered at one time? And two, when should an order be placed? (Arnold and Chapman, 2001) Management must establish decision rules to answer, how much should be ordered at one time and when should an order be placed? Economic Order Quantity (EOQ) basically answers these questions. The advantages of EOQ are many. However, EOQ is not being followed at this organization. Inventory carrying and inventory ordering costs do

not form part of the ordering policy which is likely to result in higher working capital requirement and inventory cost.

Lean principles: While declaring the material as scrap / waste, many serviceable and valuable parts / components were observed to be overlooked. The possibility of getting the equipment repaired at the unit workshop or through original manufacturer is also not seriously explored.

Procurement lead time: There is lot of time delay in procurement in this organization. The approximate lead-time to get items at consumer's end is 150 days for consumables and 170 days for spares. High lead-time affects the production. It is important to recognize that consistency of lead-time is more important than its actual length. Even with Material Requirements Planning (MRP) and Just In Time (JIT) technique, event such as stoppage of delivery dates or receipt of defective materials require constant scrutiny to ensure that suppliers maintain consistency. In uncertain conditions it may be necessary to maintain safety stocks (Lysons, 1996; & Tursine 1988).

Long procurement process: Due to complicated ordering procedures, a lot of time is lost which can be avoided by simplifying the procedures involved in ordering. The lead-time is very high (for consumable items, 150 days and for spares, 170 days approximately). Material is not made available in time to the consumers. Shop floor and maintenance people seem to feel dissatisfied.

Contract policy: Although, there are many benefits of having a rate contract policy for maximum number of items, only limited items are covered under rate contract. Consumables like stationary items, tube light, bulbs, computer cartridges and computer consumables, are not covered under rate contract.

No system to repeat an order: An order is not repeated in spite of the rates and specifications of the item being same. As the lead-time is very high (for consumable items, 150 days and for spares, 170 days approximately) at this organization, repeat order may prove fruitful.

5.2 Service Institute (Teaching and Research):

Ordering practices: Parchasing is not centralized. Mostly, users invite quotations. Quotations are opened in the user's department by the committee duly approved by the competent authority. After finalizing the quote, proposal is handed over to the Stores & Purchase department for placing the order. *If all sources of supplies are dealt centrally by Stores & purchase department, a higher order of skill can be expected.* At a time the quotations are not invited in comprehensive fashion resulting in delay in finalizing the purchases. It may also be noted that purchase of technical and scientific equipment and supplies is relatively complex, and at a time can not be straight – jacketed in a specification. This may require certain flexibility in evaluation of different quotations as each of them may have varying specifications, but can perform the intended function (Gopalakrishnan and Sundaresan, 1994).

Time delay: Customers in this Institute feel that more time is consumed in supplying the material leading to high user dissatisfaction. Users' satisfaction can be measured through timely availability of quality material.

Simplification: For easy identification of the items in store, it's very important to codify them. However, no such system is in place in this Institute. For consumable items codification system may prove to be fruitful. This system helps in identifying the items in store easily, helps avoid many names of a single item and above all, if the item is being procured on single quotation basis, one can find the past purchase prices easily so that reasonable prices of the item are paid (Mishra, 1989).

Optimization of Procurement Cost: Optimization of Procurement Cost is done through educational discount, by purchasing in lot size, by negotiating the rates and through Freight Forwarder in the case of imported equipments. A few items like Copier paper and PCs etc. are being procured in the Economic lot quantities. Cartridges and many other stationery items can also be procured under economic lot quantity. However, they are being procured in piece meals although; they are being procured on large scale. Consolidation of purchases as well as good vendor relationship can assist in cost reduction and better cost management.

Monitoring: To control excess purchases, it is necessary to scrutinize the indent/ demand of an indenting department. However, this Institute does not have any "Monitoring Cell" that can scrutinize the indent/ demand of an indenting department.

Inventory Control Techniques: Inventory decisions are based on the experience and personal judgment of the management. No inventory control technique is in operation. These settings provide a unique area for the application

of materials management techniques.

Human resource Management: There is hardly any person working in the Stores and Purchase department have the materials management degree or have any previous experience of materials functions. The function of the Materials management is a specialized one and therefore, it should be carried out by the persons who have the expertise in materials management field.

5. Suggestions

5.1. Corporate Organization

Inventory optimization

Inventory carrying and inventory ordering costs do not form part of the ordering policy, which is likely to result in higher working capital requirement and inventory cost. Management must therefore, establish decision rules to answer as to how much should be ordered at one time and when should an order be placed? For achieving this objective, an appropriate Economic Order Quantity system should be followed so that Inventory carrying and Inventory ordering costs are at minimum to avoid higher working capital requirement. Traditional literature in inventory management has considered the determination of optimal order quantity taking into consideration various costs. The well known model for the optimal order quantity (EOQ) is as follows: (Chary, 1988).

$$Q_{Optimal} = \sqrt{\frac{2C_p A}{C_c}}$$

Whereas, 'Cp' is the cost of procurement ordering per order,

'*A*' is annual consumption in units

'Cc' is the cost of carrying an inventory of *one unit* per year

Various other models are also described in the inventory literature. Organization will be benefited by use of an appropriate model to determine Optimal Order Quantity and safety stock. However, as sufficient data was not available, no specific model is being suggested. Once a good data base is created, this exercise can be considered by the organization.

Manufacturing batch size policy: The EOQ concept can be extended to the determination of optimal manufacturing batch size for semi-finished and finished goods. The trade-off of costs in this case is follows. If the batch size is large, the average level of inventory of the product is also large and therefore the inventory carrying charges are high. But, in such case, a few of such large batches would suffice for the annual requirements, the number of set-ups would be small and the corresponding set-up costs would be low. On the other hand, when the batch size is smaller, the number of set-ups required in a year to manufacture the same total quantity is higher, the order cost or the set-up cost is higher; but at the same time, the average inventory level is smaller thus making the carrying cost lower (Chary, 1988).

Introduction of Repeat Order Policy: As the purchasing process takes a lot of time at manufacturing organization, a repeat order policy be introduced for the items whose rates and specifications are same. The order can be repeated within a stipulated period, say, within 4 months or so. Purchases through repeat order facilitate immediate purchases for user's satisfaction. A repeat order would ensure timely purchases, which would help avoid production losses.

Contract Designs: As rate contract leads to lower cost and fast supplies as the ordering and procurement time is reduced, more items should be covered under rate contract. Rate contract also reduces the paper work. A good database of the usage of such items will help in identifying items, which can be procured on rate contract (Gopalakrishnan and Sundaresan, 1994).

Lead time Management in procurement: Since lead-time is longer than delivery time, not all delays are attributed to suppliers. Therefore, preparation of requisition, forwarding of requisition to purchasing, processing by purchasing from enquiry to preparation of the orders and receipt, inspection, storage / issues to production are controllable by the purchaser and can be improved by efficient clerical or computerized procedures, including vendor appraisal and specification of the most rapid method of transport. It is important to recognize that consistency of lead-time is more important than its actual length. Even with Material Requirements Planning (MRP) and Just In Time (JIT) technique, event such as stoppage of delivery dates or receipt of defective materials require constant scrutiny to ensure that suppliers maintain consistency. In uncertain conditions it may be necessary to maintain safety stocks (Kenneth Lysons, 1996).

Vendor Relationship: It should be ensured that Vendor registrations are updated regularly through press tender/ writing individually to every vendor. This would help in reducing lead time of procurement and eliminate expenditure on press enquiry for each procurement. However, only reputed suppliers/ manufacturers should be registered and for each item there should be at least 4 or 5 vendors.

Economies of scale: A single vendor might supply multiple items. If multiple items are procured from such vendors, this will save ordering cost and will minimize man-hours and paper work to a great extent. The draw back to this joint replenishment is that some items may be ordered earlier then they are required. Hence, a balanced methodology has to be adopted to make joint replenishment more cost effective.

J.I.T (Just In Time) in procurement: The items that are expected to be consumed within a period of 2 to 3 months should only be indented by the consumers. It is therefore, essential that all consumers should certify on the indent itself that indented items will be used within two to three months from the date of their receipt. This will avoid blocking of capital in excessive inventories.

Lean System: To minimize the huge cost of carrying the inventory, some immediate steps need to be taken. It may include dispose off obsolete and non moving inventory by way of circulating the list of such items to other units of this Organization and also to other Government enterprises in case they are interested in procurement of those items. This circulation should be done at the very earliest to avoid deterioration due to long storage. Alternatively, the open advertisement procedure may be adopted for their disposal. A monthly meetings must be conducted to discuss/ and draw action plans for controlling inventories. Item wise list indicating name of the indenter should be prepared for all items purchased before three years, but not moved from central stores/ site stores for more then six months. Such list should be prepared in every month and action to be taken accordingly.

Simplified Ordering System: Ordering system needs to be simplified to overcome complicated ordering procedures which result in time delays leading to idleness of man and machines. This may include computerization of all purchase functions, like, purchase requisition, draft purchase orders (DSOs), Purchase orders, acknowledgement forms and progress letters which would reduce routine clerical activity by the automatic preparation of these documents. Strong and productive relationship with the vendors should be developed. Cash purchases for small value items may be introduced. This will result in shorter delivery time as well as purchases can be made at very short notice (Lysons, 1996).

5.2. Service Institute (Teaching and Research):

Optimization: To optimize the performance and to remain in competition, the Institute has to control its purchase cost. Purchasing in lot size will result in Cost reduction. Consolidation of purchases as well as good vendor relationship and Vendor development can assist in cost reduction and better cost management. More items should be covered under rate contract. Cost reduction can also be achieved through good negotiations.

Regulating: This organization must have a Monitoring Cell that can scrutinize the demand of consuming / indenting department thoroughly to control excess purchases. For items of consumable nature, it can scrutinize the quantity previously purchased, quantity consumed till date and the balance left. Monitoring Cell will also help in identifying the right kind of policies and procedures to be followed for better inventory management.

Procurement system: People advocate that centralized purchasing is better than decentralized purchasing in terms of better purchase management. Since there is only one department dealing with various sources of supply, a higher order of skill can be expected. The most important benefit is that combining all the requirements and buying in bulk leads to substantial reduction in cost. Suppliers also, find it more convenient to approach one central purchasing department than a number of individuals or departments and have the incentive of competing of the whole or a substantial proportion of the organization's requirements. A policy clearly listing items which can be purchased by the departments as well as approved vendor list, rate contract etc. are likely to result in both higher user satisfaction and better cost management. We can however, develop systems combining the advantages of centralization and decentralization. Under this system, control should be exercised at policy level by central materials management staff at central stores & purchase department. (Gopalakrishnan and Sundaresan, 1994)

Service level: As the practice is to procure on the basis of user's indent, advantage of large size lots and

consolidated purchases should be taken into account in all cases to avoid higher ordering cost. Delivery time and quality of the goods purchased are the primary consideration of the user and hence, user satisfaction has to be measured on these criteria. A balanced policy which results in higher user satisfaction and lower cost need to be evolved. It may include systems like rate contract, vendor approved rate list and on-line purchases on a competitive basis.

Simplification: For easy identification of the items in stores, codification system should be evolved. In this institute where majority of the items are procured for research purposes where codification system may be less effective, for consumable items codification system may yield fruitful results. This system helps in identifying the past purchase prices especially for the items that are being procured on single quotation basis. Item codification will also make stock verification, stock write off and stores management easier and better. This system also helps in identifying the items in store easily; helps avoid many names of a single item.

Inventory decisions: Inventory decisions should be based on various inventory control techniques. The personal judgment, intuition and experience may provide further inputs. A good data base about item usage and analysis of the same as well as vendor rating will improve the quality, reduce the time of procurement, rapid calculation of order quantity, EOQ (Economic Order Quantities) and variation in prices from standards and budgets with price increases related to material and labor indices (Gopalakrishnan and Sandilya, 1978).

Work allocation: Proper work allocation be done by assigning right jobs to right persons. Persons without specialized back ground at times are unaware of the right kind of procedures / practices and as a result may add up to procurement cost and litigation in some cases. The function of the Materials management is a specialized one and therefore, it should be carried out by the persons who have the expertise in materials management field. Hence, the materials department must have the persons with specialized back ground. They should have the degree / diploma in materials management.

Management of Change (Kenneth Lysons, 1996): For examples of change it is necessary to look further than those, which during the last three decades have taken place in respect of the purchase functions itself. Following changes would yield fruitful results.

Technology: Computerization of all purchasing functions right from raising purchase requisition to automatic ordering of consumable items, E- procurement, purchase over net and auctions over net can be considered in future as technology is stabilizing in these areas.

The Product or Services: Purchasing has been mainly an operational function charged with obtaining items for research or internal use. While still carrying out operational tasks it should now be involved in the provision of strategic information and services.

Administrative Changes: The movement from discrete purchasing 'departments' to cross functional procedures such as the scanning, screening and selection of supplying partners by purchasing team of design and research engineers, procurement, and financial specialists.

People: From the current policy of the generalized pool of manpower, a specialized function based well trained manpower management is needed. Also, a policy of continuous up gradation of skill to keep pace with the changing technology needs to be evolved.

6. Conclusion

While the objective of any corporate organization is to cut down the cost of production and investment on inventories, the objective of service institute's inventory management is to ensure that the items stored are of high quality and are available on time to their institutional customers. Achieving of these objectives will result in more return on capital, which is materially the prime objective of an organization whether commercial, service or industrial. To achieve the above objectives, it is very important to have a better inventory management system in place. I have tried to analyze differences in the inventory management practices which may exist between the two organizations. Both are Government owned organizations, and to some extent bound by similar Government regulations and practices, but one is service organizations and the other a corporate organization. The suggestions which are made can be incorporated without any significant investment and are likely to improve the management of

the inventory system of these two organizations. The study has however been limited to only two organizations. To understand the differences as well as cause- effects, a more detailed study across other service organizations like Health care and Banking as well as manufacturing organizations like Textile and Defence should be undertaken. This would enable us to comprehensively develop a framework for procurement policies and inventory management.

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