

# Quality Controlled process framework for Procurement and Purchase System

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**Abstract-** For public sector units, NGO/ NPO and various governance systems, the purchasing function is often far down the line where still the manual / conventional way of processing is in practice. The financial functions of these organizations can save large amount of time and value of money with appropriate techniques. Efficient Purchase system in the area is central to this article, that is often overlooked for automatisations of a typical UTD system and has the largest potential payback scope in purchasing.

**Keywords-** NGO , NPO , UTD , MIS , MRP

## I. INTRODUCTION

In these tough economic times, organizations are cutting cost for their survival, government institutions are not exceptions. MIS enabled MRP Systems can improve savings, ensuring purchasing flow right through the bottom line. Government can no longer continue to overlook such obvious area of improvement. Material Requirement Planning System often uses forecasting of items and exploring them into requirements for the sub components which make them up. MIS enabled MRP system can easily process the huge computation to accumulate the demand for the low level items. MIS enabled MRP systems not only reduces inventories, but a key benefit is effectiveness in financial savings on purchasing. If forecasts are entered for end items for the next 1 year to 2 years, and the system is aware of the vendor lead time for each items, it will produce a schedule showing the quantity required of each product, by period over 1 year to 2 years. Such system can quickly react to changes in the forecast and revise the schedule appropriately, Thus the buyer will be able negotiate more favorable prices and will have advance preparation.

In this article, section 2 , describes the literature survey, section 3 presents proposed framework of identified gaps , The benefits and critical review of proposed MIS enabled MRP Interface with other system has been discussed in section 4. Finally section 5, provides conclusion and future direction for the presented work.

## II. BACKGROUND AND RELATED WORK

Government service institutions viz. teaching departments requires various quantum and quality of material, services and repairs at intermittent time and always in urgency. Person dealing with the procurement of item has to be on toes to maintain the replenishments, in other words systems requirements is analogous to Just in Time (JIT) of manufacturing and services of corporate world. Challenges before organizations and person in charge is to ensure right quality and quantity both together. Another challenge is to repair or replace with new one, keeping pace with the technological advancements of spares and accessories. However to overcome such challenges it is imperative to adopt systematic methodology to keep track of 30-50 indents/purchase orders/work orders and payment systems as per government norms. The proposed work is creating effective model of workflow so as to ensure flawless fulfillment of activity and materials/services in an organization.

In order to develop an Automated System various literature is available with respect to organization type and complexities. A model of NPO (Misha M et. al., 2015) has been presented for focusing on challenging issues for a Non Profit Organization automation that finds it difficult to handle complex hierarchical information management system. Authors have thrown light on light upon the hidden factors and challenges due to dynamic nature of requirements.

The procurement cell of Organization is dependent upon various other cells viz. Indent committee, purchase committee, technical committee, accounts and audit etc. The paperwork involved is critical and has to fulfill all norms and requirements of government. The various committees are

nothing but Quality Circles having extensive participation (Udpa 1992), involvement and result orientation. The members are varied across the organization meet at regular interval of time to solve problem, also ensure timely delivery and focused case specific solution.

The single/bulk item purchases, repairs and maintenance every activity is like Project Management activity (Gaither 2002) with so many Nodes, critical paths and parallel activities happening simultaneously. Every Quality Circle is working parallel to accomplish task of their project in hand and sometimes so many projects running parallel to each other. The flow charts given below are prepared keeping in view critical paths of PERT/CPM.

The routing and Scheduling has to be done in view of the Item, Vendor, Supplies, availability, market forces and various other factors from time to time (Bedi 2004). The Inventory of sundry items particularly papers, files and stationery items are always matter of concern for every organizations.

### III. PROPOSED MIS ENABLED PROCUREMENT AND PURCHASE SYSTEM

MIS enabled MRP system can improve operations in following areas:

- (A) Prepare Requisition-The system should print a requisition (reorder quantity) for an item as soon as it falls below its reorder point. There may be a feature of automatically grouping of requisition for a specific type of primary supplier. A log of all outstanding requisitions entered into the purchasing system and Hard copy of a report showing those that have not been acted upon within a certain period
- (B) Vendor Selection :- By maintaining vendor information committee can identify which vendor can the order, in part or complete. Provided such log of information will be useful for the selection process. This can include the price, lead time, past delivery and quality performance parameters. In future automated quotation processing can be incorporated. The system can track of all the quotations received in response to an indent and report on any that are about to expire.
- (C) Place the order The time saving and reduced clerical effort will result in timely services.
- (D) Report Status:-over the period of time, vast amount of information and sorted and report upon it in virtually any sequence as desired, The Top level executives can have information on open purchase requests: By Vendor (To monitor how much is committed to a particular vendor), By due date( to track those that are late/in risk of being late), By buyer( to see how active each buyer has been), By part-(To identify all orders for a particular part)

(E) Monitor:- with the help of status information, purchasing keeps on top of all orders, so they can anticipate and react to problems quickly.

(F) Measure Performance:-On the large amount of historical inventory, requisition and order information, one can provide reports of performance analysis on several parameters and criteria: such as (A) Count of orders and indents (requisitions) processed (B) Average number of days requisitions are overdue (C) Count of items on shortage list (D) inventory level (E) price variances and trends

*Stakeholders Involved /Organization Structure:* One Designated Clerk, Need Assessment Committee/ Procurement Committee- (Minimum 3) Members, Inventory/ Stock/ Storekeeper (1 Member), Purchase Committee (Member): (Minimum 3) and one Supporting Staff. Conventional flow of procurement Process has been demonstrated in Figure 1.

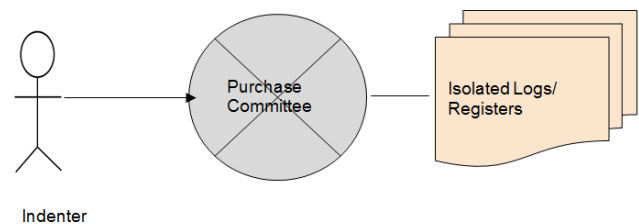


Figure 1. Current system is a typical UTD System of State University

Where needy stakeholder of the organization (Indenter) provides requisition in the form of indent and submit it to Purchase Committee for formal justification and Approval . The conventional method do not creates any Log and information of the items are maintained in isolated logs or registers. If there is a scope of (Entry) to create & review (instead of relying on the memory of committee members for Justification, so the efficiency will be surely improved. The clerk or officiating staff generate a Note Sheet for preparation of Purchase order, that in turn submitted to Party to supply the Material, a log of received material in the Store and intimation to the indenter is being maintained. For the payment process the flow from UTD For Audit is from approved note sheet is submitted by Clerk to Audit through Account for Payment of the Party. Scope of Inventory updation (if maintained ) will be from A to G. (A)P.O. (B)Party (C)Material (D)Store (E)Bill/Challan (F)Clerk/Audit (G)Account (to provide) Payment of the Party. The proposed flow of proposed framework for MIS enabled Procurement and Purchase System of UTD is described in Figure 2 , figure 3 and figure 4. These figure depicts flow of modeled system for Support system of Account of UTD.

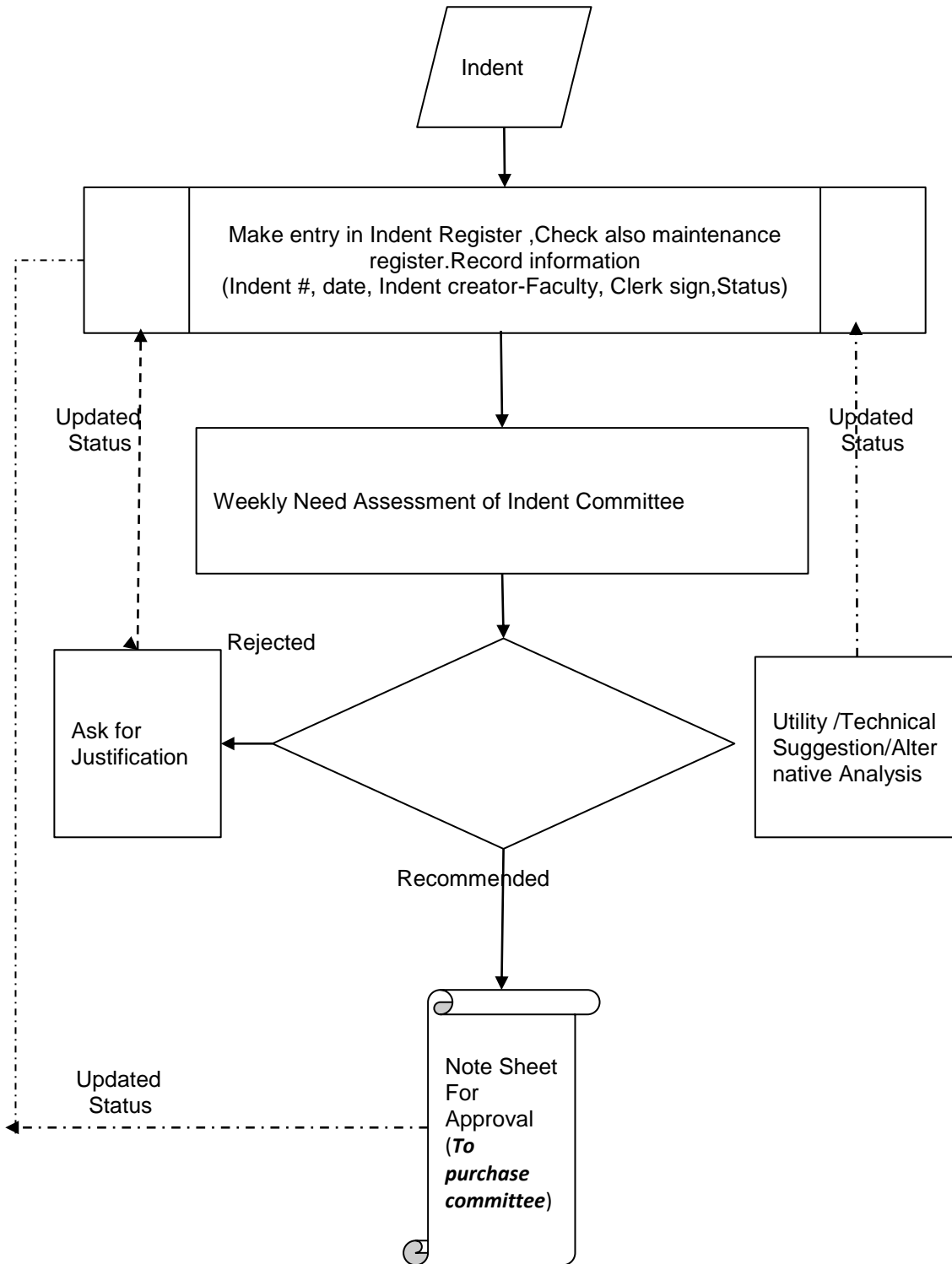


Figure 2: Flow of Indent Committee at UTD

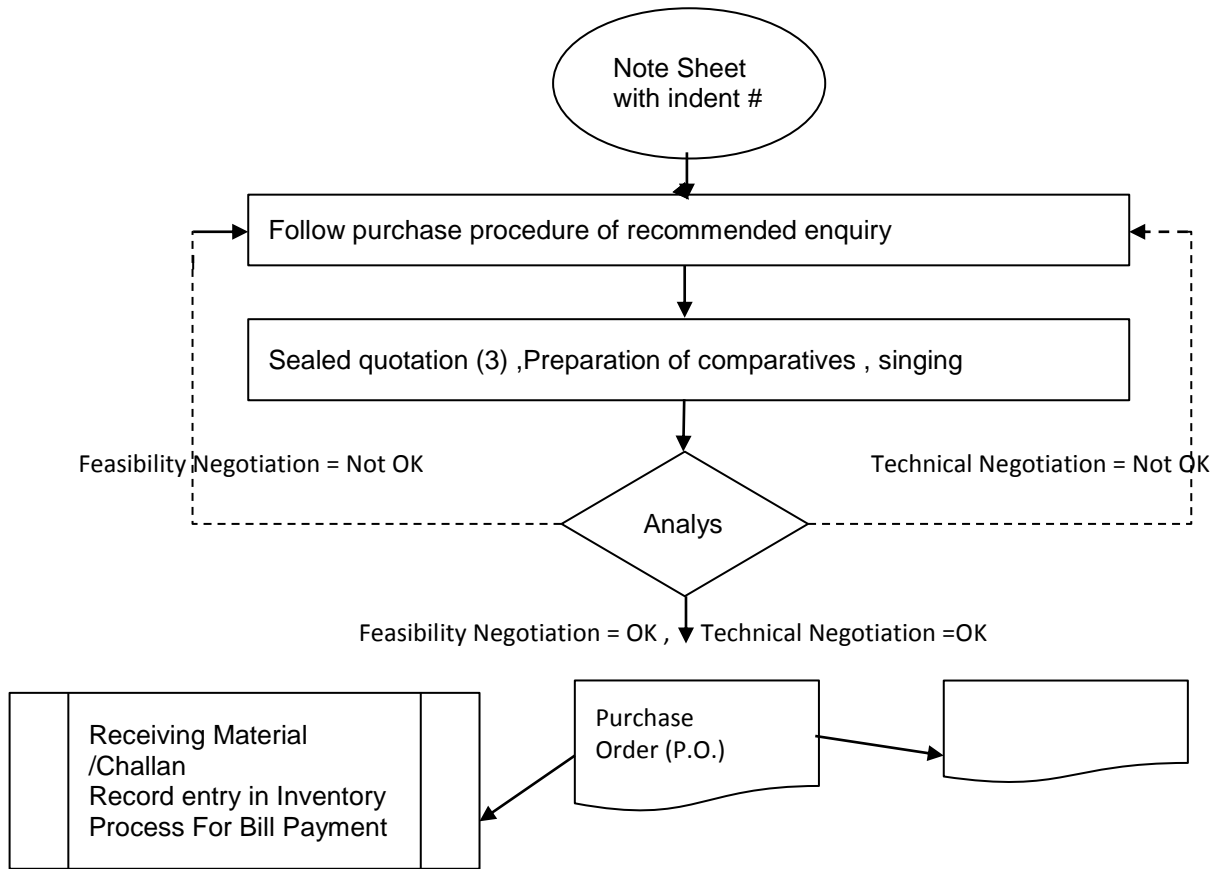
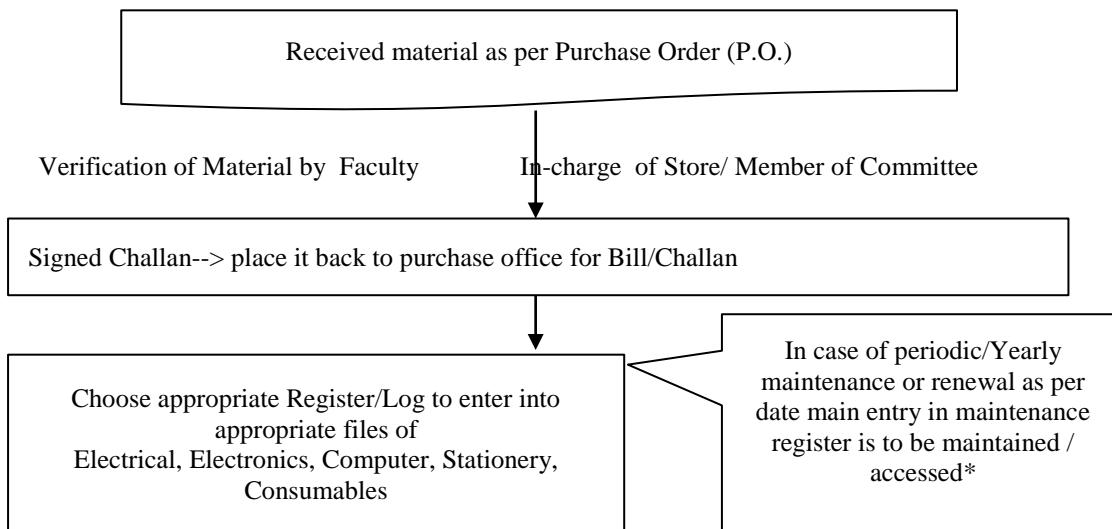


Figure 3: Procedure for Purchase Committee for UTD

**IV. MIS ENABLED INVENTORY INFORMATION SYSTEM**



\* Indent committee should check/verify as per above requirement for renewal /Maintenance

Figure 4 Inventory Information System for UTD

## V. BENEFITS OF MIS ENABLED MRP INTERFACE WITH OTHER SYSTEM

MIS enabled purchasing system is implemented as part of a more comprehensive service utilisation and material management in the UTD. The usual interfaces will be:

1. Inventory control (requirement planning) for decision making and approval of requisition data to purchasing
2. Receiving of upcoming receipts ,notification of goods and services when the good arrive.
3. Quality control tells purchasing which goods are failing inspection
4. Accounts payable receives purchase order data, so that te invoice can be matched.
5. Recommendation System Uses information on outstanding purchase orders to forecast cash requirements
6. Scheduling of information on delayed shipment to modification.

## VI. CONCLUSION AND FUTURE DIRECTIONS

This article details process for improvement in Quality Controlled Procurement and Purchase System of UTD System and provides a guideline for developing automation of UTD systems. The framework proposed in this work provides useful support in extraction of vendor performance against several criteria: (1) Total purchase from each vendor(2) Percent of (Number and value ) delivery on time(3)Percent of items failing inspection due to quality problems(4) price trends. The article provides a useful supporting document for development of software package of UTD to include a recommendation system , Vendor rating systems that allows the assignment of performance factor (weights). Such system can automatically update the points after each new purchase, allowing a composite rating to be maintained.

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- [5]. Udpa, S. R. (1992). *Quality Circles: Progress Through Participation*. Tata McGraw-Hill.
- [6]. Acronym Used in the article: NGO ( Non Government Organization ) , NPO ( Non profit organisation ), UTD ( University Teaching Departments ), MIS (Management Information System ) MRP (Material Resource Planning)