

Procure-to-Pay

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Comments by the Faculty

This paper seeks to enlighten the readers on the importance of initiating efficiencies in the purchase activity of an organization. Manufacturing firms routinely make purchases of raw materials involving large volumes with the ultimate objective of aiding the production function. There is a well-established theoretical underpinning suggesting focused interaction of the purchase department with prominent stakeholders like creditors on one hand and with internal stakeholders comprising of other departments. Incidence of inefficiencies at the purchase level leads to direct ramifications on the profitability of the firm.

It is here that the author has sought to examine the current purchase policy of the firm and recommended improvements by suggesting an alternative approach. One such approach that has been suggested is coined as 'MUSIC-3D' (Multiple Unit Selective Inventory Control – Three Dimensions) that essentially looks at eliminating inefficiencies by eliminating duplicating processes and streamlining the purchase process. The model is well developed as it lends ready application without compromising on theoretical rigour.

The paper is novel in its approach as it seeks to address the parochial problem associated with the purchase function by suggesting an innovating approach that is capable of large-scale emulation.

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Introduction

The Klueber lubrication, one of the four business groups of Freudenberg Chemical Specialities is a global company in the field of chemical industry / petroleum. The headquarters is in Munich. It is a leading manufacturer of specialty lubricants, providing tribological solutions by supplying tailor-made speciality lubricants directly to customers in almost all branches of industry and regional markets. Munich-based Klueber Lubrication has a presence in more than 30 countries around the globe. The objective is to minimise friction and wear by using the right lubrication. This reduces costs, increases efficiency and extends the working life of machines and systems. Klueber Lubricants supplies customised special lubricants for virtually every market and branch of industry.

With more than 80 years of experience, ample expertise in the industry, numerous certifications, some 150 research and development engineers and other technical specialists as well as high-performance testing facilities, they are one of the leading speciality lubricants suppliers worldwide. The company offers approximately 2000 different speciality lubricants

By providing intensive consultancy and offering wide-ranging services, the company has earned a superb reputation as a partner to trade and industry.

Project Objectives and Methodology

Procure-to-pay systems are designed to provide organizations with control and visibility over the entire life-cycle of a transaction – from the way an item is planned and ordered to the way that the final invoice is processed – providing full insight into cash-flow and financial commitments.

The procurement is an area that's ripe for improvement. A recent survey was done by BAIN & Company on executives about their experience with past procurement management initiatives. While most reported annual gains in their efforts to save, 72 per cent of the respondents believe that they could do substantially better.

Interestingly, this belief was held as frequently by the heads of procurement as it was by CEOs and CFOs. Most organizations under-manage this treasure chest. They lack a predefined, systematic playbook for reducing costs. Every company will be different, but some subset of barriers exists in nearly every organization. The Objectives of project are:

- Find Control points in the process
- Identify Lacunae in the process and areas in urgent need of improvement
- Suggest methodologies that can be implemented to improve the existing process

Following Methodologies were Used

- Understand the local and Import purchase procedure followed.
- Find the main person involved at different stages in procurement cycle.
- Observe day to day activities of department.
- Observe coordination of purchase department with other related departments.
- Taking notes for problems faced by each personnel & solutions according to them for the same problem.
- Collect and analyse procurement related data.
- Find problems and places of improvement.
- Make suggestions and recommendation.

Problems

Stock Shortage problem due to improper Safety Stock

The amount of safety stock an organization chooses to keep on hand can dramatically affect their business. Too much safety stock can result in high holding costs of inventory. In addition, products which are stored for too long a time can spoil, expire, or break during the warehousing process. Too little safety stock can result in lost sales and, thus, a higher rate of customer turnover. As a result, finding the right balance between too much and too little safety stock is essential.

Frequent stock shortage issues were observed. The shortage problem was not only with the rarely used items but also the core materials which are regularly consumed.

The safety stock for every raw material has been kept as 1 lead time by the organization. That means one reorder quantity (lead time*daily consumption) should always be there at plant as buffer. There may be few materials for which even 1 lead time safety stock won't be sufficient & few other for which safety stock itself won't be required. The main reason behind shortage is only either deviation on demand or deviation in lead time or both. The present safety stock system doesn't consider any of such kind of deviation.

Incorrect Lead-time

In a supply-chain management lead-time is the time elapsed in requisition and placing order to material keeping at warehouse. Lead time is examined closely in manufacturing, supply chain management and project management, as companies want to reduce the amount of time it takes to deliver products to the market. In business, lead time minimization is normally preferred. The company's system in finding calculating lead time is from requisition placed by production or planning department to goods received at plant (till- gate entry). The material usually goes out for weighing, since the company does not have own weighing-scale

Also some-times quality checking is outsourced due to non-availability of required Lab-equipment's. Ultimately the time incurred in quality and quantity checking is not included in the lead-time of any material. This inaccurate lead time sometimes becomes the cause of stock-shortage.

Traditional Costing System

The company follows traditional based costing system to allocate overhead expenses. Traditional costing systems apply indirect costs to products based on a predetermined overhead rate. It treats overhead costs as a single pool of indirect costs. An advantage of using traditional-based costing is that it aligns with Generally Accepted Accounting Principles, or GAAP. Traditional costing systems are simpler and easier to implement.

However, traditional costing is an outdated costing system. The problem with Traditional costing is that it can easily over allocate overhead to cost objectives. Traditional costing is production volume driven so it would be easy but yet inaccurate to assign a Skittles production with more overhead than the division within the same company that makes custom pies. Cost is not appropriately assigned because direct labour hour is not the best cost driver to use. Traditional costing negates other cost drivers that may contribute to the cost of an item. Another disadvantage of solely using the traditional costing system is that it can lead to bad management decisions because it excludes certain nonmanufacturing costs.

Classifications of Materials

Currently the Company is following ABC-XYZ classification.

The Always Better Control (ABC analysis) is a business term used to define an inventory categorization technique often used in materials management. It is also known as Selective Inventory Control. Policies based on ABC analysis:

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

XYZ analysis takes care of deviation in consumption. It shows the deviation taking average consumption as a base.

- X: It includes minimum deviation items
- Y: It includes goods with moderate deviations
- Z: It includes materials with high deviation

The biggest problem with the current classification system is that the company is not including price of material/goods. We are taking consumption quantity instead of consumption value in ABC categorization. For instance a highly consumed product with 10000units as annual consumption will come under A category and low consumed quantity 2500units will come under C category. Suppose the price for the first one is Rs 10 per unit and for the second one Rs. 60 per unit. When we see total consumption value for both the items 1st one will have INR

100000 and the 2nd one will have INR 150000. Ultimately the item in C category should be handled in a more controlled way

Improper Management of MROs and Consumables

MRO items include supplies used in the production process as well as a broad array of consumables, industrial equipment, plant upkeep supplies, and even furniture and fixtures. This is a more difficult environment in which to reduce costs, but there are certainly opportunities for doing so.

- There is no transparency of records, as all stocks regarding MROs are maintained only by an Operating person. He only raises requisitions regarding MRO requirements and ask purchase department to raise orders. The purchase department is hardly having any records for the same
- When it comes to consumption, no proper description is being given in purchase order.
- Also, many monthly petty-cash transactions were added into Consumables, which should come under separate account
- No proper gate entry for MROs is being done. Neither GRN is prepared timely.

Possible Solutions

Classification Method

Multiple Unit Selective Inventory Control in 3-Dimensions

The Music-3D (Multi Unit Selective Inventory Control) - a three dimensional approach recommended for Inventory Management is presented below

3-Dimensions	Factors	Remark
Finance	Goods Consumption (Price X Quantity), 80-20 Principle	High consumption value & Low consumption value
Operations	Weights according to Utility, Stock out cost, PerishabilityNature (Standard or Custom)	Critical & Non-critical
Material	Procurement Difficulties, lead time itself, No. of suppliers	Long-lead time & Short-lead time

Particulars	HCV		FCV	
	LLT	SLT	LLT	SLT
Critical	1	2	5	6
Non-Critical	3	4	7	8

Items in 1,2,3 & 4

- These are the 20% of items which occupies 80% of sale value in the company
- The items requires more attention and strict control
- More number of sources
- Material planning and forecasting
- Vendors analysis and relation

Items 5,6,7 & 8

- These are the 80% of items which occupies 20% of sale value in the company
- Loose control or can be delegated
- Liberal Inventory level

Modification in ABC-XYZ analysis

The existing classification system can also be continued by the company. But instead of only units as measurement, the total value (Price X Units) needs to be taken for ABC classification.

Reorder Point

Safety Stock

This inventory model with uncertainty in demand and lead time is designed to offer an inventory ordering policy that includes a reorder point and an order quantity when demand and lead time are not constant. The assumptions of the model are that demand and lead time are normally distributed. The model accounts for an inventory service level, but does not include an out-of-stock penalty.

The formula is as follows:

$$= [AD * SD \text{ of Lead Time} + SQRT (\text{Avg. Lead Time}) * SD \text{ of Demand}] * Z$$

Where,

AD= Average Demand

SD of Lead Time= Standard Deviation of Lead Time

SQRT (Avg. Lead Time) = Square root of Average Lead Time

SD of Demand = Standard Deviation of Demand

Z = Service Level

Now, **Reorder Point = Demand* Lead Time + Safety Stock**

4.2.2 Economic Order Quantity

The other alternative can be using EOQ (Economic Order Quantity) to set the reorder point and the safety stock.

$$Q^* = \sqrt{\frac{2DK}{h}}$$

Q*= optimal order quantity

D = annual demand quantity

K = fixed cost per order, setup cost (not per unit, typically cost of ordering and shipping and handling. This is not the cost of goods)

h = annual holding cost per unit, also known as carrying cost or storage cost (capital cost, warehouse space, refrigeration, insurance, etc. usually not (but sometimes) related to the unit production cost)

Economic order quantity is the order quantity that minimizes total inventory holding costs and ordering costs. A fixed percentage on EOQ can be kept as safety stock

Activity Based Costing

Activity-based costing (ABC) is a costing methodology that identifies activities in an organization and assigns the cost of each activity with resources to all products and services according to the actual consumption by each. This model assigns more indirect costs (overhead) into direct costs compared to conventional costing.

Activity-based costing provides a more accurate view of product cost. The allocation bases used in activity-based costing differ from those used in traditional costing. Activity-based costing determines every activity associated with producing an item and allocates a cost to the activity.

MROs and Consumables Management

It is impossible to reduce the cost of an MRO and consumable item if no one knows where it is stored or how many units of it are on hand. Thus, an initial step is to create an inventory record - keeping system, much as would be used for the tracking of cost of goods sold inventory. The resulting inventory information is not used by the accounting department to charge MRO items to expense, since that is usually done upon receipt. Instead, the information is most crucial to the procurement staff, who can use the on - hand inventory quantities to determine re-ordering strategies.

Pareto Analysis

The Pareto principle states that roughly 80 % of the effects come from 20 % of the causes in a population. In the case of MRO, this means that 80 % of the total cost of MRO comes from just 20 % of the MRO SKUs. Consequently, MRO cost reduction efforts should concentrate on that top 20 % of the MRO population. Any additional cost reduction forays into the other 80 % of the MRO population should first be reviewed from a cost - effectiveness standpoint to see if they really make sense to pursue. In order to verify purchases for B and C category items the company can take periodic records from their regular vendors also for eg. Safe ID Private Limited.

Distributor Invoicing

The number of a Company's separate MRO orders to its distributors can be enormous, which results in a correspondingly large flow of invoices back to the company from the distributors. The administrative cost of processing this flood of invoices is substantial, so it makes sense to request that the distributors consolidate the invoices into a single weekly or monthly invoice.

Monte-Carlo Simulation

Monte Carlo simulation is a versatile method for analysing the behaviour of some activity, plan or process that involves uncertainty. If there is uncertain or variable market demand, fluctuating costs, variation in a manufacturing process, or effects of weather on operations, the company can benefit from using Monte Carlo simulation to understand the impact of uncertainty, and develop plans to mitigate or otherwise cope with risk.

Monte Carlo methods (or Monte Carlo experiments) are a broad class of computational algorithms that rely on repeated random sampling to obtain numerical results; i.e., by running simulations many times over in order to calculate those same probabilities heuristically just like actually playing and recording results in a real casino situation. They are often used in physical and mathematical problems and are most suited to be applied when it is impossible to obtain a closed-form expression or infeasible to apply a deterministic algorithm.

In Klueber, the method can be used to check the forecast accuracy of required units which planning department gets from sales department.

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