ESTABLISHMENT OF EFFECTIVE PURCHASE MANAGEMENT SYSTEM : A STUDY OF LEADING MANUFACTURER OF WIRE AND STRANDS IN EASTERN INDIA

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ABSTRACT

With the industrialization and the liberalization of the economy, the Indian economy has undergone a drastic changein the previous years. Every business unit now aspires to maximize their profits in order to survive the ever increasing competition. With the expansion and diversification of business, the volume of transactions getting larger, a company needs a sound systematic and effective purchasing system to minimize the acquisition cost of materials. The paper endeavors to analyze the purchase management system followed in the manufacturing unit under study and identification of the bottlenecks which creates resistance in the smooth functioning of the business. Further an attempt is made to formulate a system which is more cost effective and time saving. The proposed suggestions can lead to practically significant revenue enhancement.

Keywords: Purchasing system, acquisition cost, cost effective, time saving, revenue enhancement

INTRODUCTION

For an organization purchasing is a window to the outside world (Chary,2009).The prime function of purchasing is to get the right quantity of material of the right quality at the right time , at the right place ,from the right source and at the right cost. A purchasing system administers the complete acquisition process, from requisition of materials to purchase order, receipt of goods and payment for the same. Purchasing systems are a key constituent of efficient inventory management as they examines the existing stock and help companies to determine what to purchase, how much topurchase and when to purchase. A purchasing system helps to make the purchasing system more organized and minimize the supply cost. It is generally said that 20-30% of a company's profits can come from savings generated in the purchasing department. Moreover with the expansion and diversification of business, the volume of transactions getting larger, a company needs a sound, systematic and effective purchasing system to bear the brunt of the ever increasing competition in the market.The purchase system may be classified into Pre-Purchase systems, Ordering system and Post Purchase system (Panneerselvam,2001).As there are many ways to manage the purchase department, the major concern has been whether to centralize or decentralize the system.

Centralized purchasing system refers to the procurement of materials through common purchasingdivision for all the departments in the organization. The authority and responsibility to purchase, lease, or rent materials, supplies, goods, equipment, or services are placed with the

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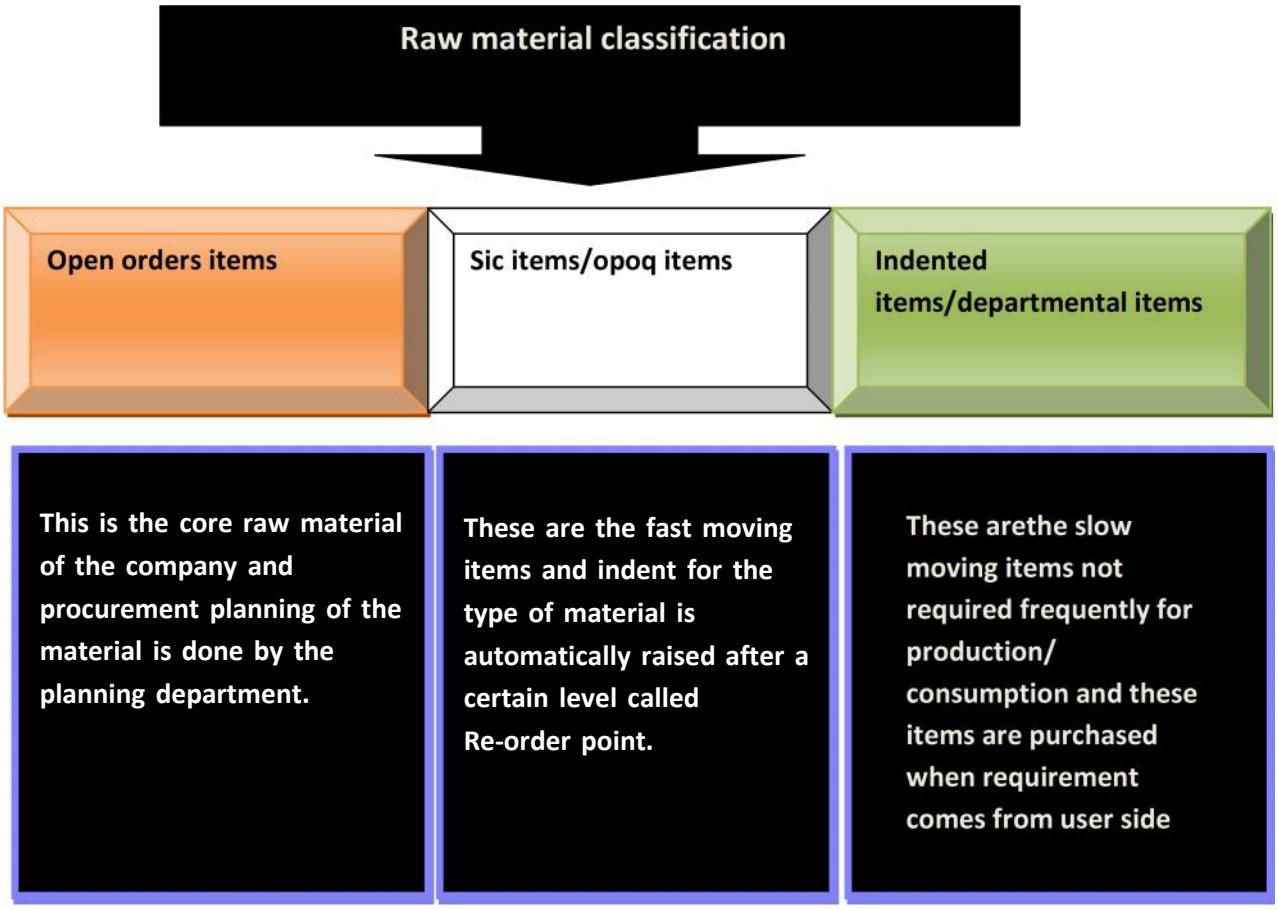
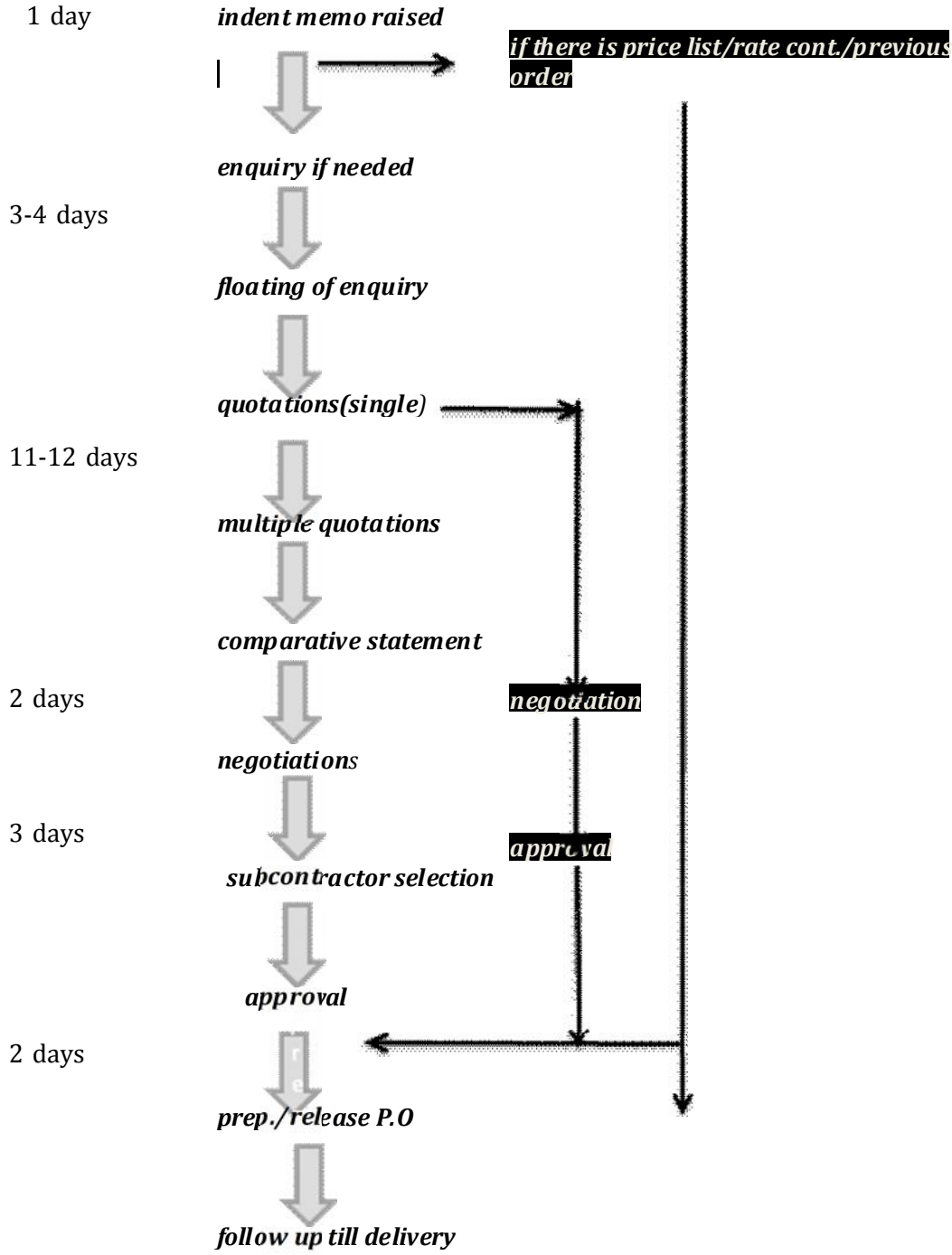
Division of Finance and Operations, Purchasing and Stores Department. Decentralized purchase refers to independent purchase made by all the departments' in order to fulfill their needs. Under this system there is no common purchasing authoritythat has a right to procure the materials for all the departments. Both the systems havetheir own pros and cons and there is no way to determine as to which one is the best method.Suitability of the method depends upon the requirement and the availability ofresources in the organization.

The manufacturing unit under study follows a centralized purchasing pattern and backward integration method with regard to its major core raw material wire rod. Approx 90% of wire rod is procured from Jamshedpur plant and 10% of material isimported. Basically for procurement raw material is classified into three categories:



Purchasing procedure followed in the manufacturing unit along with the time taken:



Total time taken-21 days

OBJECTIVES OF THE STUDY

- To analyze the purchasing management system followed in the manufacturing unit and to identify the bottle necks which create obstacles in smooth functioning of system.
- To discover the means for making the system more cost effective and time saving.

REVIEW OF LITERATURE

(Levy et al, 1987) emphasizes on the importance of inventory management as a key factor in manufacturing industry. The paper discusses the differences between two industrial models: the assembly line model and the high tech job shop "science based "model and recommend the inventory approach suitable for each of the model. Just -in-time methods are not appropriate for the research and development job shop oriented industries. This method is more applicable in assembly line industries. Moreover, the author developed a strategy which can be implemented in purchasing and managing the inventories in 'science based industries'.

(Gelderman et al,2003) talks about as how the role of purchasing has evolved from clerical, administrative function into a strategic function that can provide a competitive edge to the company. In the past 30 years there has been a revolution in purchasing system which leads to the changed role, impact and responsibilities of purchasing management. This study deals with the gap between the lack of academic research into purchasing portfolio models and their increasing implementation by practitioners. A general shift has been observed in the organizational buying behavior from an antagonistic mode to the most co-operative mode. Purchasing new responsibility is to contribute to developmentof supplierand relationship management, identification, developmentand management of new and existing suppliers. Purchasers can concentrate on managing suppliers as against placing orders and expediting.

(Albronda et al, 2004) explores the importance of a portfolio approach of a global supply base to the management. Real global sourcing refers to the combination and harmonization of procurement requirements across worldwide business units. The paper attempts to strike the balance between local opportunities and global contracting, identify the type of strategies adopted by the purchasing professionals globally using a portfolio approach and handling of purchasing portfolio measurement issues by the experienced professionals.

(Geldermen et al, 2005) in the paper addresses the question as to whether the use of purchasing portfolio models is regarded as a sign of purchasing sophistication. Purchasing sophistication is a key characteristic of the purchasing system and the extent of erudition will determine whether to include it in the strategic decision making process or not. Consideringthe data from wide sample of industries, it was discovered that the purchasing sophistication is a two dimensional construct: purchasing position and purchasing professionalism. The finding of the study implies that the purchase portfolio usage is allied with portfolio professionalism. The study evidences that the companies who fail to endorse portfolio sophistication in the purchase management are lagging behind both in purchasing position and professionalism in the overall company hierarchy.

(Kraljic,1983) in his paper has dealt in details how the old methods of purchasing still persistsinspite of the rapid changes in the environment wherein companies continue to negotiate annually with theirestablished networks of suppliers or sources. Skills and outlooks which were formed 20 years ago in an era of relative stability haven't changed. The author offers pragmatic advice on how top management can recognize the extent of its own supply weakness and treat it with a comprehensive strategy to manage supply.

(Tachizawa ,2005) in his paper has tried to explore the reasons why firms need supply flexibility and stressed upon two main strategies-increase suppliers' responsiveness capability and flexible sourcing. He alsosuggested that the supply flexibility strategy selected depends on two factors: the supplier searching and switching

costs and the type of uncertainty (mix, volume or delivery).

(Tahariri et al,2014) aims to provide a systematic model stimulating correct supplier selection using the Fuzzy Analytic Hierarchy Process (FAHP).According to him, to select the best supplier, it is essential to make an analytical decision based upon tangible and intangible criteria. The proposed model in this study was applied in a steel manufacturing company in Malaysia with the goal of reducing time in choosing the correct supplier for the company.

METHODOLOGY

This study is an attempt to understand the effectiveness of purchasing system both from the operational andfinancial perspective. The study of Operational effectiveness is based on the calculation of deviation from the standard lead time in the procurement of materials. Financial effectiveness relies on the calculation of the amount of capital blocked up in the inventory.A sample size of 49 itemsused in the process of production is considered for the period of one year. The research design adopted by the study is purely quantitative and exploratory.

DATA ANALYSIS:

Operational effectiveness

A total of 48 items in the organization with their lead time is calculated. The mean and variation of this lead time against the standard time i.e. 21 days are calculated for a particular year.

The variation in lead time may be attributed to a host of factors like lack of manpower, irresponsibility on the part of the store to put up the requisition in time, the working environment etc.The delay in the order processing increases the work pressure which again is not substantiated by fresh intake in the department. Also the quotations received takes much longer time than expected due to negligence on part of the suppliers who take their job for granted in the absence of a competitive environment.It has been seen that most of the time thesuppliers do not adhere to the lead time which already has been set at a higher end by the organization and this safeguard the suppliers who fail t deliver in time leading to bottlenecks in the production.

Months	Mean Lead Time	StdDev
Jan	31.71	18.94
Feb	29	16.92
Mar	28.58	14.37
Apr	28.47	14.48
May	28.89	14.23
Jun	30.14	16.74
Jul	29.2	14.42
Aug	28.89	14.23
Sep	28.68	14.28
Oct	27.64	11.02
Nov	28.89	14.23
Dec	28.89	14.23

FINANCIAL EFFECTIVENESS

The difference between the average stock required for the 48 items under study and the current stock lying in the stores is analyzed to calculate the excess stock for the period of one year. The amount of capital blocked due the maintenanceof excessive stock is computed in order to assess the amount of interest foregone. The interest is calculated @10%.

Month	Items	Units	Avg Stock	Current Stk	Excess Stk	Rate Rs	Total Rs
January	Borax Penta Hydrate	mt	4.45	13.05	9.6	36000	345600
January	Servo system-60	ltr	1085	2940	1855	100	185500

Month	Items	Units	Avg Stock	Current Stk	Excess Stk	Rate Rs	Total Rs
January	Plastic Bobbin DIN 250(22B)	Nos	380	1404	1124	65	73060
January	Hyland yellow enamel paint	ltr	22.33	180	159.67	68	1087.66
Febuary	Blue HDPE sheet Plain	mt	2.82	5.1	2.28	18500	340400
Febuary	Soap 7080	kg	287.5	750	462.5	115	53187.5
Febuary	Hyland yellow enamel paint	ltr	23.33	40	16.67	68	1133.56
Febuary	Plastic Bobbin DIN 250(22B)	Nos	380	1264	884	65	57460
March	Servo system-60	ltr	1085	2100	1015	100	101500
March	Plastic Bobbin DIN 250(22B)	Nos	380	1224	844	65	57460
March	Rustop Paper 14"*100 mtrs	Roll	55	200	145	480	69600
March	Blue HDPE sheet Plain	Kmt	7.6	27.5	19.9	18500	368150
April	3mm Marker tape	kg	436	901	465	325	151125
April	Plastic Bobbin DIN 250(22B)	Nos	117	904	787	65	51125
April	Hyland Blue road marker	ltr	960	2000	1040	81	84240
April	Rustop Paper 14"*100 mtrs	Roll	55	185	130	480	62400
May	3mm Marker tape	kg	436	1303	867	325	281775
May	Servo system-60	ltr	1225	2310	1085	100	108500
May	Plastic Bobbin DIN 250(36B)	Nos	1877	5000	3123	65	202995
May	plastic Bobbin DIN 250(22B)	Nos	117	700	583	65	37895
May	Rustop Paper 14"*100 mtrs	Roll	55	185	130	480	62400
May	Blue HDPE sheet Plain	Kmt	5.5	21	15.5	18500	286750
May	Hytherm 500 Thermic fluid	ltr	385	2520	2135	110	234850
June	3mm Marker tape	kg	436	2114	1678	325	548275
June	Plastic Bobbin DIN 250(36B)	Nos	1877	4344	2467	65	160855
June	LDPE stretch wrapping film 4"	kg	846	2484	1638	110	180180
June	2mm Blue Cruggtd plastic sheet	Nos	495	1000	505	250	126250
June	Hytherm 500 Thermic fluid	ltr	385	1890	1505	110	165550
June	Soap 7080	kg	188	450	270	115	31050
July	3mm Marker tape	kg	436	2230	1794	325	583050
July	Plastic Bobbin DIN 250(36B)	Nos	1416	4800	3384	65	219960
July	plastic Bobbin DIN 250(22B)	Nos	1877	3734	1857	65	120705

Month	Items	Units	Avg Stock	Current Stk	Excess Stk	Rate Rs	Total Rs
July	3"HDPE roll 3"*160 mtrs	Roll	339	900	561	155	86955
July	Hytherm 500 Thermic fluid	ltr	385	2940	2555	110	281050
August	3mm Marker tape	kg	436	2312	1876	325	609700
August	Plastic Bobbin DIN 355	Nos	1416	4500	3084	155	478020
August	Plastic Bobbin DIN 250(36B)	Nos	1877	3634	1757	65	114205
August	3"HDPE roll 3"*160 mtrs	Roll	339	2500	2161	155	334955
August	Hytherm 500 Thermic fluid	ltr	385	3570	3185	110	350350
September	3mm Marker tape	kg	436	1824	1388	325	451100
September	plastic Bobbin DIN 250(22B)	Nos	117	1034	917	65	59605
September	3"HDPE roll 3"*160 mtrs	Roll	339	3000	2661	155	412455
September	Hytherm 500 Thermic fluid	ltr	385	2100	1715	110	192610
October	1.5 mm Marker Tape	kg	258	468	210	500	105000
October	3mm Marker tape	kg	436	1572	1096	325	356200
October	Servo system-60	ltr	1225	2100	875	100	87500
October	Plastic Bobbin DIN 355	Nos	867	3100	2233	155	346115
October	Plastic Bobbin DIN 250(36B)	Nos	1877	3272	1395	65	90675
October	Plastic Bobbin DIN 250(22B)	Nos	117	1034	917	65	59605
October	3"HDPE roll 3"*160 mtrs	Roll	339	2000	1661	155	257455
November	3mm Marker tape	kg	436	1258	822	325	267150
November	Servo system-60	ltr	1225	2100	875	100	87500
November	Plastic Bobbin DIN 355	Nos	867	3634	2773	155	429815
November	3"HDPE roll 3"*160 mtrs	Roll	339	2000	1661	155	257455
December	cutting oil	ltr	1833	2750	917	115	105455
December	plastic Bobbin DIN 250(22B)	Nos	117	560	443	65	28795
December	Rustop Paper 14"*100 mtrs	Roll	55	486	431	480	206880
December	Hytherm 500 Thermic fluid	kg	385	1680	1295	110	142450
December	3"HDPE roll 3"*160 mtrs	Roll	339	1043	704	155	109120

Total amount of capital blocked = Rs 11662244

Calculation of interest @ 10%

date	Avgamt(Rs)	Calculation	IntAmt (Rs)
15-Jan	133046.75	350x133046.75x10/100x365	12758
14-Feb	113045.25	320x113045.25x10/100x365	9910
15-Mar	149177.5	305x149177.5x10/100x365	12465
15-Apr	87222.5	275x87222.5x10/365x100	6571
08-May	173595	252x173595x10/365x100	11985
08-Jun	202026.6	222x10x202026.6/365x100	12287
15-Jul	258344	185x258344x10/365x100	13094
15-Aug	377446	155x377446x10/365x100	16028
15-Set	278942.5	125x278942.5x10/365x100	9552
08-Oct	135192.8	102x135192.8x10/365x100	3777
15-Nov	260480	65x260480x10/365x100	4639
06-Dec	118540	44x118540x10/365x100	1428
		Total	114494

The analysis of 49 production items reveals that the total capital blocked in the inventory is very huge amounting to Rs 11662244 for a period of one year. The same if invested in the market will fetch the company an interest equivalent to Rs 114494. The reasons behind overstocking of materials can be attributed to the lack of co-ordination between purchase department and stores department. Secondly, High lead time has been set to safeguard the supplier because as per ISO norms if a vendor has defaulted more than 3 times in delivery he will be removed from vendor list. High lead time is followed for the fast moving items which creates a huge bulky mountain of inventory, in which organization's maximum fund is blocked.

SUGGESTIONS

- Annual rate contract should be done with the vendors which requirefinalization of contract with the vendors on the regular basis.It should be made mandatory for the vendors to maintain the safety stock for a period of one month. This will help in shifting the burden of maintaining the excessive stock from the organization thereby reducing the investment in the inventory. Moreover when ARC will be implemented, the time for the procurement of materials will be reduced automatically.

Lead time = order processing time + vendor material processing time+ transportation time + material unloading and quality inspection time.

ON THE IMPLEMENTATION OF ARC:

Lead time = Vendor material processing time+ transportation time+ material unloading and quality inspection time.

- Calculation of economic order quantity will help the purchasing department to procure the right amount of material thereby minimizing the ordering cost and carrying cost.
- The survey of the vendors discloses that near about payment of 70% of the vendors is delayed. Prompt payment to the vendors may increase their loyalty towards the organization.

"Inclusion of more parameters in the vendors rating technique: -at present the vendors are evaluated on four parameters i.e. quality, service, delivery and price. Additional parameters like technical support, emergency support, value addition on product life cycle, quotation required date can be considered to evaluate the competency of the vendors.

- Classification of lead time for the various items should be done. Lead time for the procurement of different items need to be calculated separately rather than having a standardized lead time of 21 days.

CONCLUSION

Over the past 15-20 years purchasing function has gained more importance in the organization and there has been a shift in the responsibilities of purchasing manager from mere placing a purchase order with the supplier to the requirement of significant expertise in the field of finance, engineering, manufacturing and quality. The study was an attempt to understand the purchasing effectiveness from operational and financial perspective. The analysis reveals that the purchasing system in the concerned organization is not effective, as the average lead time for all the items is more than the standard time set for the procurement of materials. The deviation in lead time leads to the maintenance of the higher safety stocks which increases the amount of investment in the inventory. The total amount of capital blocked for the period of one year amounts to Rs 11662244 which if invested in the market will earn an interest of approximately Rs 114494 per month for the company. This calls for the review of purchasing system in the organization like implementation of annual rate contract, revision of lead time for all the items, strengthening of the relationship with the vendors and calculation of economic order quantity.

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