ANNEXURE I

STUDY ON PROCUREMENT PROCESS AT "L & T LTD, COIMBATORE"

By

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A PROJECT REPORT

Submitted to the

FACULTY OF MANAGEMENT SCIENCES

in partial fulfilment for the award of the degree
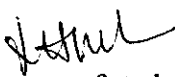
of

MASTER OF BUSINESS ADMINISTRATION

CENTRE FOR DISTANCE EDUCATION
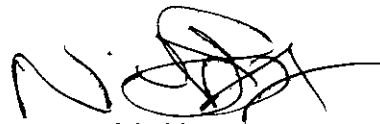## ANNA UNIVERSITY CHENNAI
CHENNAI 600 025

July, 2009

ANNEXURE II

BONAFIDE CERTIFICATE

Certified that the Project report titled "Study on Procurement Process at L & T Ltd,

Coimbatore" is the bonafide work of Mr R.Parthiban. who carried out the work under

my supervision. Certified further that to the best of my knowledge the work reported

herein does not form part of any other project report or dissertation on the basis of

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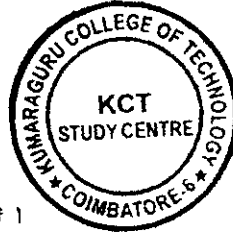
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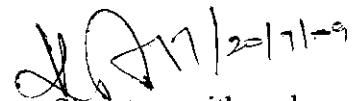
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This is to certify that **Mr.R.Parthiban**, of Anna University has done the project work titled **'STUDY ON PROCUREMENT PROCESS AT L & T LTD, COIMBATORE"** from 18.04.2009 to 15.07.2009 in partial fulfillment of the requirement for the Degree of master of Business Administration

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ABSTRACT:

The primary purpose of the study is to provide an overview of L&Ts procurement operations, processes and information systems. As such, this study results will provide an awareness of mandatory requirements, policy considerations, guidelines, procedures and best practices in the field of procurement. The study report will also analyze about each activities in the field of procurement and compare it with the standard process measures in the departmental manual of L&T based on the input the procurement executives and related departmental employees.

In this project, Data will be captured through questionnaires with relevant personnel. This will indicate the current process followed by the employees in the organisation. These processes will be mapped in tables against the standard process measures. Findings will be reported in the form of activities to improve with the current procedure for matching the standards of L&T. It will also direct the organisation towards the goal to reach the process limit in the purchase manual. This project is carried through the chi-square analysis which will compare and find the process capability which is followed in the organisation against the standard procedures.

ACKNOWLEDGEMENT

I would like to thank The Director, Centre for Distance Education, Anna University-Chennai for giving the opportunity to carry out this valuable project which will help to my career.

I also like to thank Dr.S.Sadasivam, Coordinator, KCT Study Centre, Coimbatore, Mr.A.Senthil Kumar, Counsellor-MBA Programme, KCT Study Centre, Coimbatore, Prof.Dr.S.V. Devanathan, Project in-charge, and other members of Project Monitoring Committee, KCT Study Centre, Coimbatore for their valuable guidance throughout this project

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R.PARTHIBAN

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CHAPTER 1
INTRODUCTION

1.1 ABOUT THE ORGANISATION:

Larsen & Toubro Limited (L&T) is a technology, engineering, construction and manufacturing company. It is one of the largest and most respected companies in India's private sector.Seven decades of a strong, customer-focused approach and the continuous quest for world-class quality have enabled it to attain and sustain leadership in all its major lines of business.L&T has an international presence, with a global spread of offices. A thrust on international business has seen overseas earnings grow significantly. It continues to grow its overseas manufacturing footprint, with facilities in China and the Gulf region.

The company's businesses are supported by a wide marketing and distribution network, and have established a reputation for strong customer support.L&T believes that progress must be achieved in harmony with the environment. A commitment to community welfare and environmental protection are an integral part of the corporate vision.

Operating Divisions:
- Engineering & Construction Projects (E&C)
- Heavy Engineering (HED)
- Engineering Construction & Contracts (ECC)
- Electrical & Electronics (EBG)
- Machinery & Industrial Products (MIPD)
- Information Technology & Engineering Services

1.2. BACKGROUND STUDY:

The process followed in L&T as shown below in sequential operation,

Figure: 1.1 Procurement process in L&T.

1.2.1. Procurement steps:

Procurement life cycle in modern businesses usually consists of seven steps:

- Information Gathering:

If the potential customer does not already have an established relationship with sales/ marketing functions of suppliers of needed products and services (P/S), it is necessary to search for suppliers who can satisfy the requirements.

- Supplier Contact:

When one or more suitable suppliers have been identified, Requests for Quotation (RFQ), Requests for Proposals (RFP), Requests for Information (RFI) or Requests for Tender (RFT or ITT) may be advertised, or direct contact may be made with the suppliers.

- Background Review:

References for product/service quality are consulted, and any requirements for follow-up services including installation, maintenance, and warranty are investigated. Samples of the P/S being considered may be examined or trials undertaken.

- Negotiation:

Negotiations are undertaken, and price, availability, and customization possibilities are established. Delivery schedules are negotiated, and a contract to acquire the P/S is completed.

- Fulfilment:

Supplier preparation, shipment, delivery, and payment for the P/S are completed, based on contract terms. Installation and training may also be included.

- Consumption, Maintenance and Disposal:

During this phase the company evaluates the performance of the P/S and any accompanying service support, as they are consumed.

- Renewal:

When the P/S has been consumed and/or disposed of, the contract expires, or the product or service is to be re-ordered, company experience with the P/S is reviewed. If the P/S is to be re-ordered, the company determines whether to consider other suppliers or to continue with the same supplier.

1.3. NEED FOR STUDY:

- To map the process involved in the procurement department
- To verify the departmental process is properly followed in the organization

1.4. OBJECTIVES & SCOPE:

The primary purpose of the study is to provide an overview of L&Ts procurement operations, processes and information systems

1.5. DELIVERABLES:

- To understand the current process of L&T, by getting inputs from the employees through questionnaires and interviews.
- To improve the process to the bench mark, by comparing the current process with the professional standards

CHAPTER 2

LITERATURE SURVEY

2.1 – REVIEW OF LITERATURE

This process is followed from Toyota production systems taken from Toyota website for reference

Flow Chart of the Purchasing Process

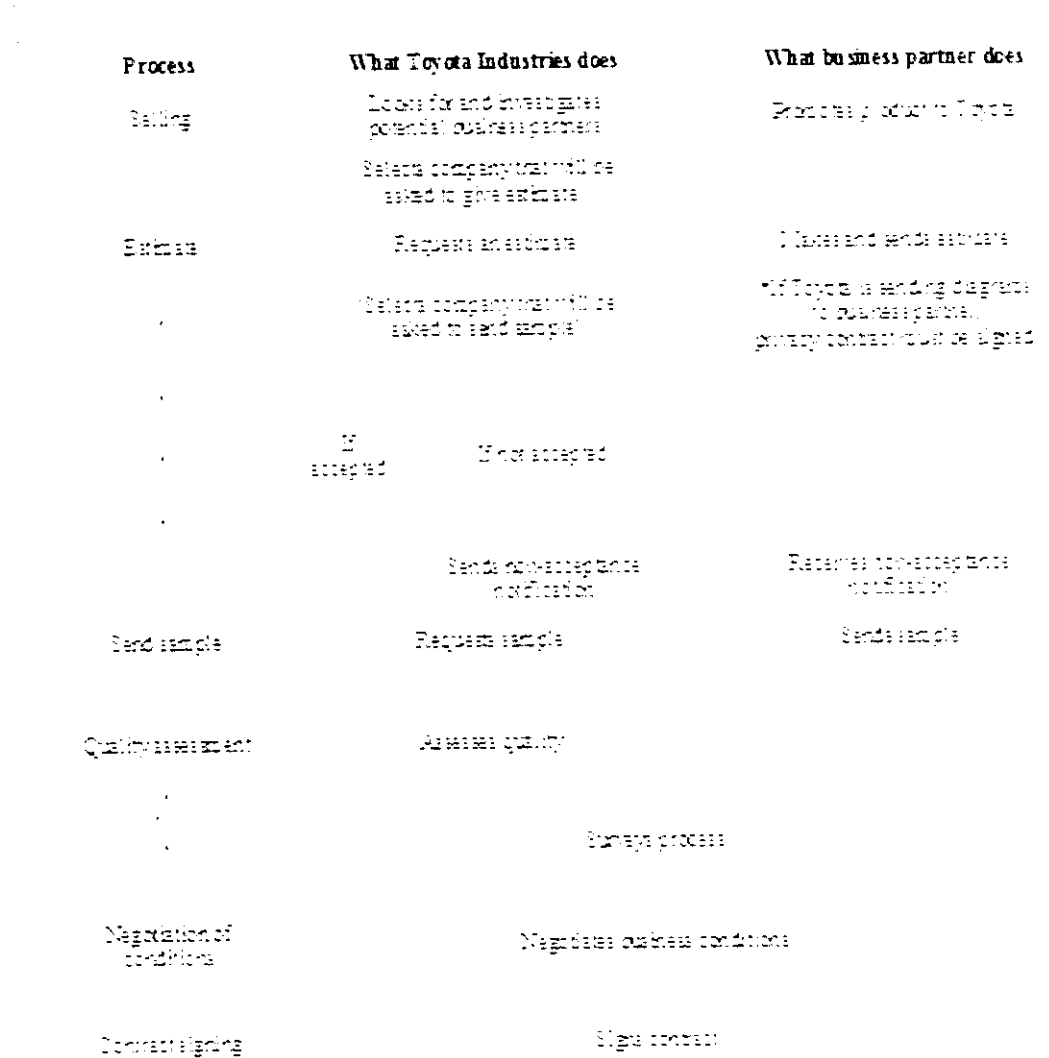| Process	What Toyota Industries does	What business partner does
Selling	Looks for and investigates potential business partners	Proactively adverts to Toyota
	Selects company that will be asked to give estimate	
Estimate	Request an estimate	Makes and sends estimate
	Selects company that will be asked to send sample	If Toyota is sending diagrams to business partner, primary contract must be signed
	If not accepted	If not accepted
		Sends non-acceptance notification	Receives non-acceptance notification
Send sample	Request sample	Sends sample
Quality assessment	Assesses quality	
		Sample process
Negotiation of conditions	Negotiates business conditions	
Contract signing	Sign contract	

Figure – 2.1 – Toyota procurement process

Source: Toyotaproduction.com

In the literature of ' 'Glossary of Defense Acquisition Acronyms and Terms, 12th Edition (plus updates since publication), accessed on 22 April 09 Defence Acquisition University.

Procurement is the acquisition of goods and/or services at the best possible total cost of ownership, in the right quality and quantity, at the right time, in the right place and from the right source for the direct benefit or use of corporations, individuals, or even governments, generally via a contract. Simple procurement may involve nothing more than repeat purchasing. Complex procurement could involve finding long term partners – or even 'co-destiny' suppliers that might fundamentally commit one organization to another.

Almost all purchasing decisions include factors such as delivery and handling, marginal benefit, and price fluctuations. Procurement generally involves making buying decisions under conditions of scarcity. If good data is available, it is good practice to make use of economic analysis methods such as cost-benefit analysis or cost-utility analysis.

An important distinction is made between analysis without risk and those with risk. Where risk is involved, either in the costs or the benefits, the concept of expected value may be employed.

Direct procurement and indirect procurement			
		TYPES	
		Direct Procurement	**Indirect Procurement**	
		Raw Material and Production Goods	**Maintenance, Repair and Operating (MRO) Supplies**	**Capital Goods and Services**
FEATURES	**Quantity**	Large	Low	Low
	Frequency	High	Relatively high	Low
	Value	Industry specific	Low	High
	Nature	Operational	Tactical	Strategic
	Examples	Crude oil in petroleum industry	Lubricants, spare parts	Machinery, computers

Table: 2.1 – Direct and Indirect procurement process.

Based on the consumption purposes of the acquired goods and services, procurement activities are often split into two distinct categories. The first category is being direct, production-related procurement and the second being indirect, non-production-related procurement.

Direct procurement occurs in manufacturing settings only. It encompasses all items that are part of finished products, such as raw material, components and parts. Direct procurement, which is the focus in **supply chain management**, directly affects the production process of manufacturing firms. In contrast, indirect procurement activities concern "operating resources" that a company purchases to enable its operations. It comprises a wide variety of goods and services, from standardised low value items like office supplies and machine **lubricants** to complex and costly products and services like heavy **equipment** and consulting services.

- Procurement vs. Acquisition:

The US Defence Acquisition University (DAU) defines procurement as the act of buying goods and services for the government. DAU defines acquisition as the conceptualization, initiation, design, development, test, contracting, production, deployment, Logistics Support (LS), modification, and disposal of weapons and other systems, supplies, or services (including construction) to satisfy DoD needs, intended for use in or in support of military missions.

Acquisition is therefore a much wider concept than procurement, covering the whole life cycle of acquired systems. Multiple acquisition models exist, one of which is provided in the following section.

- Acquisition Process:

The revised acquisition process for major systems in industry and defence is shown in the next figure. The process is defined by a series of phases during which technology is defined and matured into viable concepts, which are subsequently developed and readied for production, after which the systems produced are supported in the field.[2]
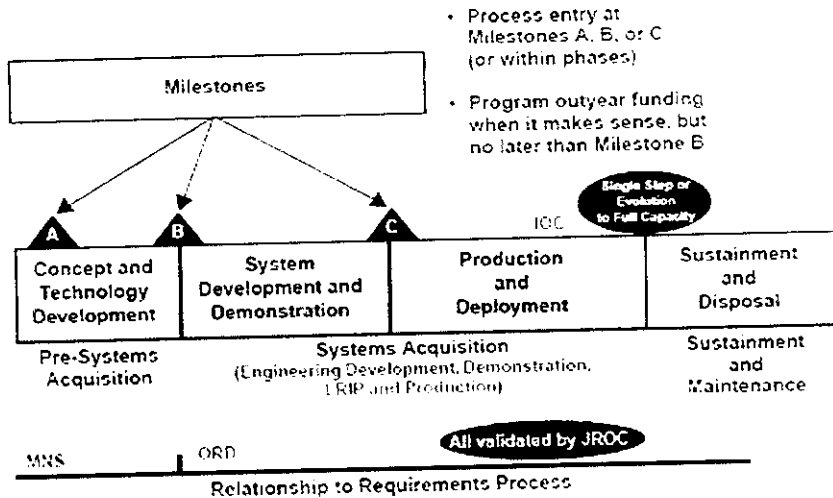
Fig.2.2 – Relationship to procurement process.

- Model of the Acquisition Process :

The process allows for a given system to enter the process at any of the development phases. For example, a system using unproven technology would enter at the beginning stages of the process and would proceed through a lengthy period of technology maturation, while a system based on mature and proven technologies might enter directly into engineering development or, conceivably, even production. The process itself includes four phases of development:

1. Concept and Technology Development: is intended to explore alternative concepts based on assessments of operational needs, technology readiness, risk, and affordability.

2. Concept and Technology Development phase begins with concept exploration. During this stage, concept studies are undertaken to define alternative concepts and to provide information about capability and risk that would permit an objective comparison of competing concepts.

3. System Development and Demonstration phase. This phase could be entered directly as a result of a technological opportunity and urgent user need, as well as having come through concept and technology development.

4. The last, and longest, phase is the Sustainment and Disposal phase of the program. During this phase all necessary activities are accomplished to maintain and sustain the system in the field in the most cost-effective manner possible.

- Procurement systems:

Another common procurement issue is the 'timing' of purchases. Just In Time is a system (commonly used by Japanese companies but widely adopted by many global manufacturers from the 1990s onwards) of timing the purchases of consumables so as to keep inventory costs low.

- Shared services:

In order to achieve greater economies of scale, an organization's procurement functions may be joined into shared services. This combines several small procurement agents into one centralized procurement system.

- Procurement process:

Procurement may also involve a bidding process i.e., Tendering. A company may want to purchase a given product or service. If the cost for that product/service is over the threshold that has been established (e.g.: Company X policy: "any product/service desired that is over $1,000 requires a bidding process"), depending on policy or legal requirements, Company X is required to state the product/service desired and make the contract open to the bidding process. Company X may have ten submitters that state the cost of the product/service they are willing to provide. Then, Company X will usually select the lowest bidder. If the lowest bidder is deemed incompetent to provide the desired product/service, Company X will then select the submitter who has the next best price, and is competent to provide the product/service. In the European Union there are strict rules on procurement processes that must be followed by public bodies, with contract value thresholds dictating what processes should be observed (relating to advertising the contract, the actual process etc).

CHAPTER – 3
METHODOLOGY

3.1. TYPE OF PROJECT:

Descriptive type –

a) To study the existing procurement manual published the L&T.

b) To find and fill the gap between existing practice by the purchase officers and in the process manual.

c) To find the gap between the current procedure and the process manual in L&T and benchmark the Process followers in the field of procurement.

3.2. TARGET RESPONDENTS:

a) DGM – Purchase:

Purchase DGM's are the final deciding authority for the strategic decisions like new vendor approvals, process changes. In Coimbatore, there are 4 manufacturing departments, each having 1 purchase DGMs, Total 4 DGMs. They are in the ways to report the process objectives to their sub-ordinates and process achievements to the managements. These respondents will helpful in implementing the findings of the projects. Process study will not be effective among these respondents

b) Procurement managers:

Purchase managers are heading the group of buyers. They are responsible for guiding the buyers in selecting the vendors, maintaining the inventory in the factory and also to ensure the smooth flow of production. Surveying among these managers is essential in understanding the sustainment and follow up of process. There are 2 – 3 managers in each unit comprise of 12 managers.

c) Buyers:

Buyers are the process followers for the procurement systems. They are the essential respondents whose input will contribute for the conclusions. But they will not helpful in implementing the findings. Process of buyers in an organisation is the procurement process of the organisation, which should not deviate from the purchase manual in the

organisation. There are 10 buyers in each unit of Coimbatore, of total 40 buyers. Each buyer will have different roles to play in the systems. Their views will be varied according to their roles

d) Quality managers:

Quality managers will be in the final stage of scrutinising the process followed by buyers, Since quality product will only the objective of the organisation which in turn come from the quality supplied raw materials. Surveying among them will add value to the research and also to give the best conclusion, since quality is the internal customer of the purchase. There are 3 – 4 managers in each unit comprise of 16 managers.

3.3. SAMPLING METHODS:

A survey that measures the entire target population is called a Census. Since researcher are surveying to entire target population, Census method is used in the research.

Census method is used in this research by surveying all 72 employees in L&T-Coimbatore in the field of procurement and quality at various positions from DGMs to trainees. Also researcher includes the quality managers to validate the accuracy of process in the field of product improvement. These samples are surveyed through the questionnaire method and their results are entered to analyse the data.

3.4. DATA PROCESSING:

Processing of data is mainly focussed on the comparative analysis. Purchasing process of L&T will be compared with the benchmarking process like Toyota production system. Purchasing process will analyse and processed through the outcome of the questionnaires. Each point in the questionnaires will be processed in the different angles to validate the systems followed in L&T against the manual and benchmark.

Processing of data will be done through the various aspects like out of total population, DGMs, Quality managers, Buyers etc. Each aspect will be analysed with respect to the characters and positions of the employee. Findings at each stage are important to validate the research.

3.5. TOOLS FOR ANALYSIS:

3.5.1. Chi square test - Goodness of fit test.

The chi-square test (Snedecor and Cochran, 1989) is used to test if a sample of data came from a population with a specific distribution. An attractive feature of the chi-square goodness-of-fit test is that it can be applied to any uni-variate distribution for which you can calculate the cumulative distribution function. The chi-square goodness-of-fit test is applied to binned data (i.e., data put into classes). This is actually not a restriction since for non-binned data you can simply calculate a histogram or frequency table before generating the chi-square test. However, the value of the chi-square test statistic is dependent on how the data is binned. Another disadvantage of the chi-square test is that it requires a sufficient sample size in order for the chi-square approximation to be valid.

The chi-square test is an alternative to the Anderson-Darling and Kolmogorov-Smirnov goodness-of-fit tests. The chi-square goodness-of-fit test can be applied to discrete distributions such as the binomial and the Poisson. The Kolmogorov-Smirnov and Anderson-Darling tests are restricted to continuous distributions.Additional discussion of the chi-square goodness-of-fit test is contained in the product and process comparisons

Definition:

The chi-square test is defined for the hypothesis:

H0:   The data follow a specified distribution.

Ha: The data do not follow the specified distribution.

Test   For the chi-square goodness-of-fit computation, the data are divided into k bins
Statistic: and the test statistic is defined as

$$\chi^2 = \sum_{i=1}^{k}(O_i - E_i)^2/E_i$$

Where O_i is the observed frequency for bin i and E_i is the expected frequency for bin i. The expected frequency is calculated by

$$F_i = N(F(Y_u) - F(Y_l))$$

where F is the cumulative Distribution function for the distribution being tested, Yu is the upper limit for class i, Yl is the lower limit for class i, and N is the sample size.

This test is sensitive to the choice of bins. There is no optimal choice for the bin width (since the optimal bin width depends on the distribution). Most reasonable choices should produce similar, but not identical, results. **Data plot** uses 0.3*s, where s is the sample standard deviation, for the class width. The lower and upper bins are at the sample mean plus and minus 6.0*s, respectively. For the chi-square approximation to be valid, the expected frequency should be at least 5. This test is not valid for small samples, and if some of the counts are less than five, you may need to combine some bins in the tails.

Significance Level: α.Critical Region: The test statistic follows, approximately, a chi-square distribution with (k - c) degrees of freedom where k is the number of non-empty cells and c = the number of estimated parameters (including location and shape parameters) for the distribution + 1. For example, for a 3-parameter Weibull distribution, c = 4.

Therefore, the hypothesis that the data are from a population with the specified distribution is rejected if

$$\chi^2 > \chi^2_{(\alpha, k - c)}$$

where $\chi^2_{(\alpha, k - c)}$ is the chi-square percent point function with k – c degrees of freedom and a significance level of α.

In the above formulas for the critical regions, the Handbook follows the convention that χ^2_{α} is the upper critical value from the chi-square distribution and $\chi^2_{1 - \alpha}$ is the lower critical value from the chi-square distribution. Note that this is the opposite of what is used in some texts and software programs. In particular, Data plot uses the opposite convention.

Chapter 4

DATA ANALYSIS AND INTERPRETATION

4.1 ANALYSIS OF DATA:

The data collected in the research is listed below. It was collected with our target respondents in the different levels of procurement department in L&T

Question No.	Choices	DGM	Managers	Buyers	Quality manager
1	0 -30	2	5	34	8
	30 - 60	1	4	4	5
	60 - 90	1	3	2	3
	>90	0	0	0	0
2	0 -30	0	1	7	1
	30 - 60	1	2	25	8
	60 - 90	1	8	6	5
	>90	2	1	2	2
3	Very good	3	3	10	13
	Good	1	8	28	3
	Average	0	1	2	0
	Below Avg.	0	0	0	0
4	0 -30	0	1	23	0
	30 - 60	1	6	8	2
	60 - 90	1	3	9	5
	>90	2	2	0	9
5	0 -30	0	1	6	0
	30 - 60	0	2	30	1
	60 - 90	2	6	4	5
	>90	2	3	0	10
6	0 -30	0	2	30	0
	30 - 60	1	4	10	3
	60 - 90	2	5	0	4
	>90	1	1	0	9
7	0 - 1 day	2	2	20	14
	1 - 2 days	1	2	10	2
	2 - 4 days	1	0	8	0
	>5 days	0	0	2	0

Question No.	Choices	DGM	Managers	Buyers	Quality manager
8	0 - 15 days	0	1	2	3
	15 - 30 days	1	3	5	6
	30 - 60 days	2	7	27	5
	>60 days	1	1	6	2
9	0 -30	0	1	3	1
	30 - 60	1	2	6	10
	60 - 90	2	4	25	1
	>90	1	5	6	0
10	0 - 1 day	1	6	13	2
	1 - 2 days	3	3	17	6
	2 - 4 days	0	3	7	4
	>5 days	0	0	3	0
11	0 - 15 days	2	4	20	5
	15 - 30 days	1	5	10	3
	30 - 60 days	1	2	7	4
	>60 days	0	1	3	0
12	0 - 30 days	0	1	6	4
	30 - 60 days	3	6	24	6
	60 - 90 days	1	4	7	2
	>90 days	0	1	3	0

Table 4.1 – Results of questionnaires

By comparing with the, L&T manual, percentage of acceptance level of the each question was compared and thru Chi-square analysis, researcher concludes the result.

Calculation sheet is attached in the Appendix 2. Model calculation of the chi-square analysis for the 1st questionnaire is explained below,

4.1.1 MODEL CALCULATION:

Question:

What is the % in accuracy of forecast from planning department?

a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

Choices	Response from the respondents- H0	As per L&T purchase manual- H1
0 – 30 %	24%	20%
30 – 60 %	31%	20%
60 – 90 %	44%	55%
>90 %	1%	5%

Table 4.2 – Results for Q1

Chi-Square – Goodness of fit analysis:

a) Chi-squared $\quad$ = (observed-expected)^2 / (expected)

$\quad$ = $(24 - 20)^2/20 + (31- 20)^2/20 + (44- 55)^2/55 +(1-5)^2/5$

$\quad$ = 12

b) Degrees of freedom (DF) = No of classes – 1

$\quad$ = 4 – 1

$\quad$ = 3

By looking into the table for Chi-Square in DF = 3, Probability value is greater than .05, which stating that the observed hypothesis H0 is not acceptable.

Like that every question was analysed and acceptable status was found.

4.2. DIAGRAMMATIC REPRESENTATION

Observation from the questions in the survey conducted among the employees of L&T, Coimbatore.
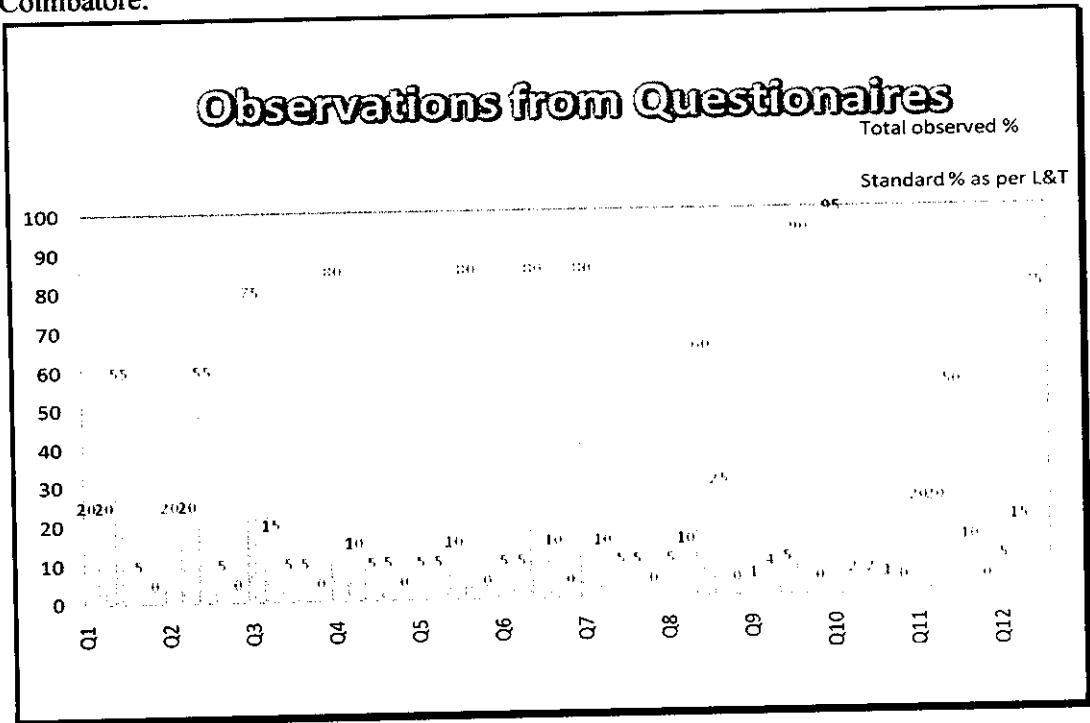
Fig 4.1 – Observations from questionnaires

Q – Question Number

Employee details of L&T, who attended the survey conducted by the researcher
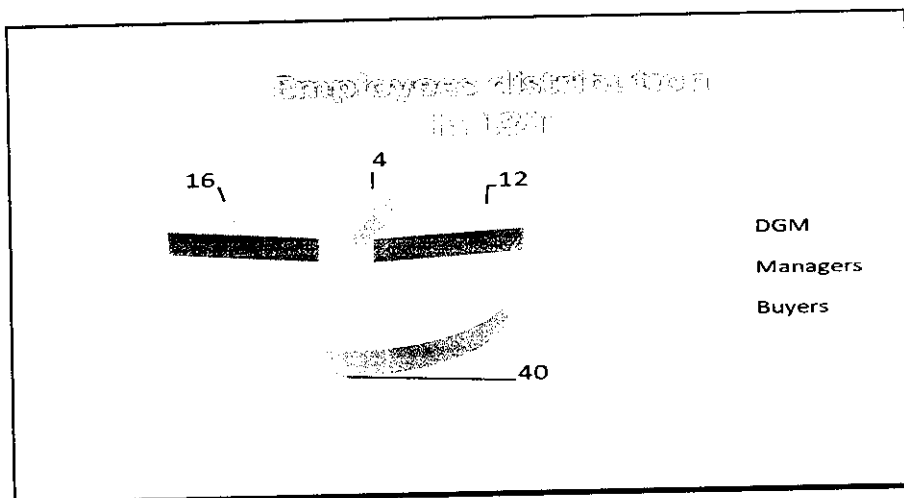
Fig 4.2 Employees distribution in L&T

View of quality managers in quality deliverables from the supplier
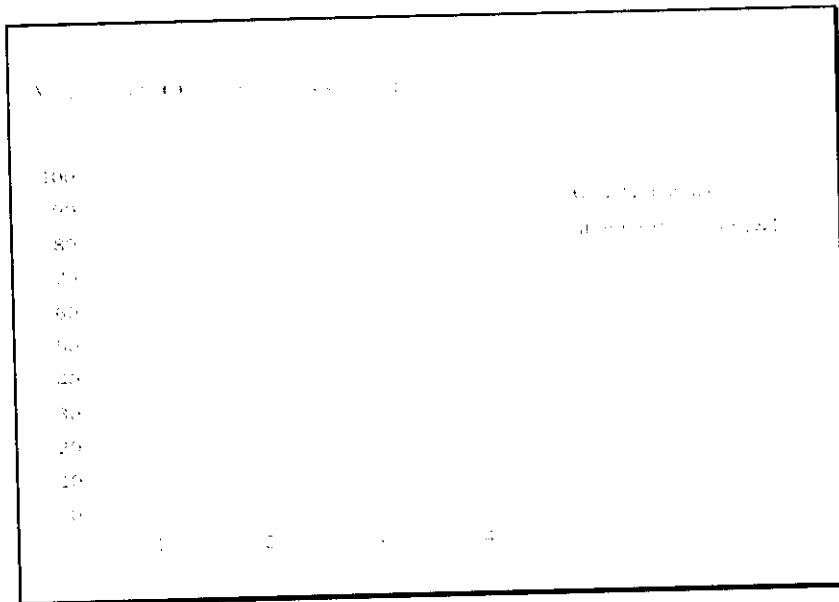
Fig 4.3 Quality managers view

4.3. DELIVERABLES:

Comparison between L&T standard and actual practice study was made among the employees. There are several deliverables to the employers for acting upon it.

As a result of Chi-square analysis,

1.   Process needs to be evaluated, since it is not practising up to the standards of L&T.

2.   All the process is having major deviation from the standards; it needs to fine tune towards the standards.

CHAPTER 5

CONCLUSIONS

5.1. SUMMARY OF FINDINGS:

- Findings

Each question is representing each activities of procurement process

(Refer Appendix -1)

Question No.	Total observed %	Standard % as per L&T	H0 acceptable status if Chi-square >.05 at DF=3
Q1	24	20	Not acceptable
	31	20	
	44	55	
	1	5	
Q2	17	20	Acceptable
	28	20	
	49	55	
	7	5	
Q3	72	75	Acceptable
	22	15	
	3	5	
	3	5	
Q4	64	80	Not acceptable
	19	10	
	8	5	
	8	5	
Q5	4	5	Not acceptable
	7	5	
	14	10	
	75	80	
Q6	7	5	Acceptable
	10	5	

Question No.	Total observed %	Standard % as per L&T	H0 acceptable status if Chi-square >.05 at DF=3
	71	80	
	10	10	
Q7	78	80	Acceptable
	14	10	
	6	5	
	3	5	
Q8	7	5	Acceptable
	17	10	
	57	60	
	19	25	
Q9	1	1	Acceptable
	6	4	
	8	5	
	79	90	
Q10	92	95	Not acceptable
	7	2	
	1	2	
	0	1	
Q11	18	20	Acceptable
	22	20	
	50	50	
	6	10	
Q12	7	5	Acceptable
	19	15	
	63	75	
	6	5	

Table 5.1 - Status of activities followed in L&T

1.   Accuracy of forecast from planning department is observed to deviates from the standard of L&T. As per L&T standard, Accuracy of 55 % should be the in the range of 60 – 90%, but actually observed is 44%. There is a vast deviation which makes the

process failure. This should be addressed in top priority to avoid the shoot up of inventory due to the wrong forecast.

2.   Delivery lead time is varying from the standard calculated one. This will create unexpected production halt, since materials from supplier will not reaches per the plan. Only 64% of employees are telling that there is a deviation in the range of 0-30% against the 80% in standard.

3.   Purchase order generated from the ERP system of L&T should be understand to more than 80% of supplier as per standard, but actually 75% of supplier only understanding the details in the purchase orders. This will create the confusion to the suppliers in the following ways,

a) Materials ordered
b) Address to send
c) Payment terms
d) Price of the item to send

4.   There should be a minimum of 0-1 day production stoppages due to   material shortage will be allowed as per standard, but it is observed to be 92% which will further have the chance to increase the stoppage by 1 day. This will incur major loss to the company. Hence this has to be taken care on urgent basis to avoid such loses in future.

5.2. SUGGESTIONS AND RECOMMENDATIONS:

1. Accuracy of forecast should be addressed in top priority by the way of arranging the discussions with marketing and planning frequently. Planning has to be deeply interact with purchase will avoid the false forecast and interpretation. Inventory plan also to be made for the different categories of items like imports etc.

2. Delivery lead time accuracy failure will create unexpected production halt, since materials from supplier will not reaches per the plan. To finalise the delivery lead time in accurate form, there should be a strong supplier relationship. This will help the purchaser to choose and fix the lead time accurately. Transit time and delays should also to be included in the lead time.

3. To provide the accurate data in the purchase order, L&T have to have one to one discussion to all suppliers and new format to be developed with useful information for the suppliers after incorporating all the suggestions given by the supplier.

4. To reduce number of production stoppages due to non-availability of materials has to reduce by knowing the exact lead time of all individual material. All the buffers should be added to the lead time will ensure the exact receipt of materials.

5.3. CONCLUSIONS:

By studying the procurement process of L&T, Researcher concludes that 4 areas in the field of procurement need to be re-validated and match with the standard process of L&T.

Areas need to expedite are:

1. Accuracy of forecast plan

2. Delivery time deviation from standard

3. Clarity of system generated purchase order with respect to suppliers

4. Production stoppage due to material shortage.

5.4. DIRECTION FOR FUTURE RESEARCH:

Future research will be in the form of comparing the standards in the documentation of L&T with international standards to bench mark the process followed in procurement.

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Questionnaire

Personal Details:

Name: [   ]   Division: [   ]

S No: [   ]   Designation: [   ]

Questions:

. What is the % in accuracy of forecast from planning department?

   a) 0 – 30%   b) 30 – 60%   c) 60 – 90%   d) Above 90%

. Quantity deviation % between requirement and MOQ of the product

   a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

. The selection process of new vendor is

   a) Very good b) Good c) Average d) Below average

. Delivery time deviation between the actual and planned for the production

   a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

. Is system generated purchase order details understand by the suppliers?

   a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

. Accuracy of follow-up methods by ERP to track the status of order?

   a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

. What is the lead time of Goods received and quality check in the factory?

   a) 0 – 1 day b) 1 – 2 days c) 2 – 4 days d) >5 days

. Normal payment terms given to vendor?

   a) 0 – 15 days b) 15 – 30 days c) 30 – 60 days d) >60 days

. % of Assurance of quality deliverables from supplier end?

   a) 0 – 30% b) 30 – 60% c) 60 – 90% d) Above 90%

10. Average no of days that production has stopped due to material shortage

   a) 0 – 1 day b) 1 – 2 days c) 3 – 4 days d) >5 days

11. Normal lead time between order date and receipt date of goods for local items

   a) 0 – 15 days b) 15 – 30 days c) 30 – 60 days d) >60 days

12. Normal lead time between order date and receipt date of goods for import items

DGM	Managers	Buyers	Quality manager	Total Count	Total %	DGM %	Managers %	Buyers %	Quality manager %	% as per L&T Manual	Square	Chi-Square	Prob value	H0 acceptable status if Chi-square > .05 at DF=3
4	12	40	16	72	Total									
2	5	2	8	17	24	50	42	5	50	20	1	12	<.05	Not acceptable
1	4	12	5	22	31	25	33	30	31	20	6			
1	3	25	3	32	44	25	25	62.5	19	55	2			
0	0	1	0	1	1	0	0	2.5	0	5	3			
0	1	10	1	12	17	0	8	25	6	20	1	6	>.05	Acceptable
1	2	9	8	20	28	25	17	23	50	20	3			
2	8	20	5	35	49	50	67	50	31	55	1			
1	1	1	2	5	7	25	8	3	13	5	1			
3	8	28	13	52	72	75	67	70	81	75	0	5	>.05	Acceptable
1	2	10	3	16	22	25	17	25	19	15	3			
0	1	1	0	2	3	0	8	3	0	5	1			
0	1	1	0	2	3	0	8	3	0	5	1			
2	6	30	8	46	64	50	50	75	50	80	3	16	<.05	Not acceptable
1	3	8	2	14	19	25	25	20	13	10	9			
1	2	1	2	6	8	25	17	3	13	5	2			
0	1	1	4	6	8	0	8	2.5	25	5	2			
0	1	2	0	3	4	0	8	5	0	5	0	3	<.05	Not acceptable
0	1	3	1	5	7	0	8	7.5	6	5	1			
1	2	5	2	10	14	25	17	12.5	13	10	2			
3	8	30	13	54	75	75	67	75	81	80	0			
0	2	2	1	5	7	0	17	5	6	5	1	6	>.05	Acceptable
1	2	2	2	7	10	25	17	5	13	5	4			
3	7	32	9	51	71	75	58	80	56	80	1			
0	1	2	4	7	10	0	8	5	25	10	0			
3	9	30	14	56	78	75	75	75	88	80	0	3	>.05	Acceptable
1	2	5	2	10	14	25	17	12.5	13	10	0			
0	1	3	0	4	6	0	8	7.5	0	5	2			
0	0	2	0	2	3	0	0	5	0	5	0			
0	1	1	3	5	7	0	8	3	19	5	1	6	>.05	Acceptable
0	3	2	6	12	17	0	25	5	38	10	1			
1	7	27	5	41	57	25	58	68	31	60	4			
2	1	10	2	14	19	50	8	25	13	25	0			
1	0	1	0	1	1	25	0	3	0	1	0			

DGM	Managers	Buyers	Quality manager	Total Count	Total %	DGM %	Managers %	Buyers %	Quality manager %	% as per L&T Manual	Square	Chi-Square	Prob value	H0 acceptable status if Chi-square >.05 at DF=3
4	12	40	16	72	Total									
0	1	2	1	4	6	0	8	5	6	4	1	4	>.05	Acceptable
0	2	3	1	6	8	0	17	8	6	5	2			
4	9	34	10	57	79	100	75	85	63	90	1			
3	11	37	15	66	92	75	92	93	94	95	0			
1	1	2	1	5	7	25	8	5	6	2	12	13	<.05	Not acceptable
0	0	1	0	1	1	0	0	3	0	2	0			
0	0	0	0	0	0	0	0	0	0	1	1			
1	4	3	5	13	18	25	33	8	31	20	0	2	>.05	Acceptable
1	2	10	3	16	22	25	17	25	19	20	0			
2	5	25	4	36	50	50	42	63	25	50	0			
1	1	2	0	4	6	25	8	5	0	10	2			
0	1	3	1	5	7	0	8	8	6	5	1	4	>.05	Acceptable
1	2	6	5	14	19	25	17	15	31	15	1			
3	8	28	6	45	63	75	67	70	38	75	2			
0	1	3	0	4	6	0	8	8	0	5	0			