Trough External Service Management Improve Quality & Productivity

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Abstract: *The challenges in Small car project, necessitated improvements in quality and productivity, right from day one of implementation of project. Detailed studies on external management services, manufacturing process, various departments involved, and procedures followed were done, and problems in the existing system were identified and solutions were provided. The object of this paper is to investigate methods of measuring performance. The subject of this paper is the process of implementing methods to increase productivity. Methods (procedures) of the study. Pattern during the writing of this work was used by scientist's articles information about the measurement and implementation of systems productivity. Since this work was written with the use of different methods and examples, not all of them before writing the work were known to me, I want to present a certain part to improve the productivity of some companies in my country.*

Keywords: *Outsourcing of services reduces unemployment, increases productivity and job creation.*

I. Introduction

1.1. Introduction of organization

Tata Technologies Ltd (TTL) is the only specialist organization of its kind able to serve its clients with a global delivery model for Engineering Services Expertise in end-to-end automotive platform conceptualization, design & engineering. It works with every major automotive OEM (ORIGINAL EQUIPMENT MANUFACTURING) in the world and over 200 manufacturing companies.

The service offerings of TTL include:

1. Product Design, Analysis and Production Engineering
2. Plant Automation and Manufacturing Execution System
3. Embedded System
4. Knowledge Based Engineering (KBE)
5. Product Life cycle Management
6. Enterprise Resource Planning (ERP) Solution
7. Customer Relationship Management (CRM) Solution

Tata Technologies is a fully owned subsidiary of TML and handles all of its Engineering and Information Technology (IT) services in the present business. TTL is an important stakeholder in its new projects and will play a lead role in the areas of plant Automation and Manufacturing Execution System for those projects. TTL members will be part of the project team during the life cycle of the implementation and would be responsible thereafter for the support services.

II. Tata Motors Ltd. (TML)

Tata Motors Limited is India's largest automobile company, with revenues of Rs. 32,426 Crores (USD 7.2 Billion) in 2006-07. It is the leader in commercial vehicles in each segment, and the second largest in the passenger vehicles market with winning products in the compact, midsize car and utility vehicle segments. The Company is the world's fifth largest medium and heavy commercial vehicle manufacturer, and the world's second largest medium and heavy bus manufacturer.

Established in 1945, Tata Motors presence indeed 1 million passenger cars cuts across the length and breadth of India. 4 Million Tata vehicles play on Indian roads, since the first rolled out in 1954. The Company's manufacturing base is spread across Jamshedpur, Pune and Lucknow and Pantnagar (Uttarakhand); it has set up an industrial joint venture with Fiat Group Automobiles at Ranjangaon (Maharashtra) to produce both Fiat and

Tata cars and Fiat power trains. The nation – wide dealership, sales and services and spare parts network comprises over 3500 touch points. The company also has a strong auto finance operation, Tata Motor Finance, for supporting customers to purchase Tata Motors vehicles.

1.2. Introduction of new project

Tata Motors' plant for the Tata Nano at Sanand, located in the Ahmadabad district of Gujarat. The capacity of the plant, to begin with, will be 250,000 cars per year to be achieved in phases, and with some balancing is expandable up to 350,000 cars per year. Provision for further capacity expansion has also been incorporated in this location. Built in a record time of 14 months starting November 2008, the integrated facility comprises Tata Motors' own plant, spread over 725 acres and an adjacent vendor park, spread over 375 acres, to house key component manufacturers for the Tata Nano.

As part of process planning various systems are developed as under-

1. Logistics Planning (Inbound & Out bounding activities)
2. Training school
3. Safety
4. Recruitment
5. Tooling (Metrology & others)
6. Contract (External Services)
7. LCA (Low Cost Automation)
8. MES (Manufacturing Execution System)
9. 3P (Production Preparation Process)
10. TPM (Total Productive Maintenance)
11. Enterprise Resource Planning (ERP) implementation
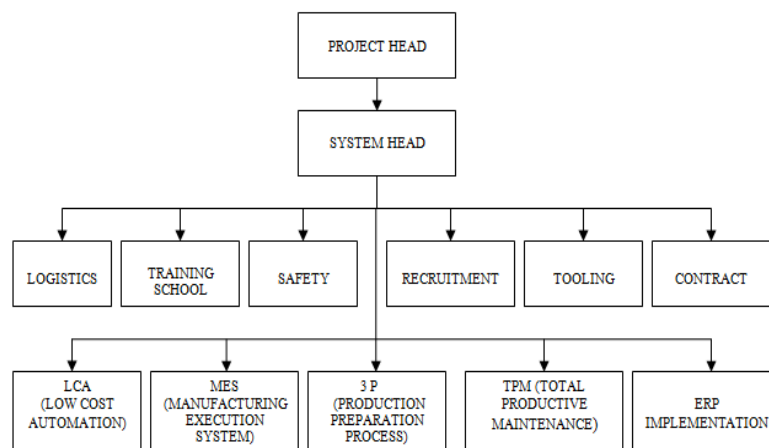
1.3. Organization structure

Fig.1 Organization Structure

1.4 Introduction of productivity and quality

DEFINITION OF PRODUCTIVITY

Productivity is a measure relating a quantity or quality of output to the inputs required to produce it.

OR

The amount of output per unit of input (labor, equipment and capital). There are many different ways of measuring productivity. For example, in a factory productivity might be measured based on the number of hours it takes to produce a good, while in the service sector productivity might be measured based on the revenue generated by an employee divided by his / her salary.

DEFINITION OF QUALITY

Quality in everyday life and business, engineering and manufacturing has a pragmatic interpretation as the non-inferiority, superiority or usefulness of something. This is the most common interpretation of the term. The meaning for the term 'QUALITY' has developed over time. Various interpretations are given below:
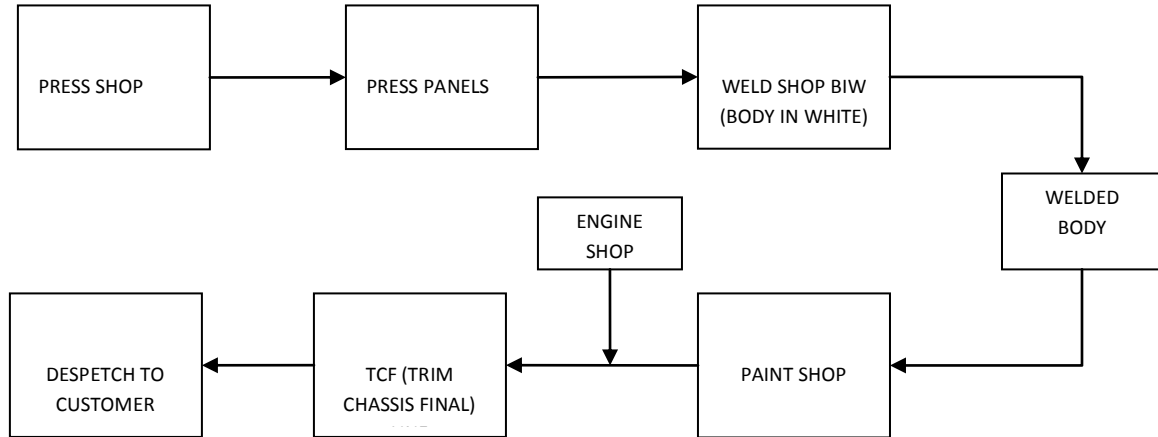
1. ISO 9000 – Degree to which a set of inherent characteristic fulfills requirements.
2. Joseph M Juran – "Fitness for use". Fitness is defined by the customer.
3. **QUALITY IMPROVEMENT CYCLE –** A quality improvement cycle is a planned sequence of systematic and documented activities aimed at improving a process.

Improvement can be done in two ways –
1. By improving the process itself and / or
2. By improving the outcomes of the process

1.5 Automotive manufacturing process of car
The main activities are carried out in production process are -

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┌─────────────┐       ┌─────────────┐       ┌─────────────────┐
│  PRESS SHOP │  ───▶ │ PRESS PANELS│  ───▶ │ WELD SHOP BIW   │
│             │       │             │       │ (BODY IN WHITE) │
└─────────────┘       └─────────────┘       └─────────────────┘
                                                      │
                                                      ▼
                            ┌──────────┐       ┌─────────────┐
                            │  ENGINE  │       │  WELDED     │
                            │  SHOP    │       │  BODY       │
                            └──────────┘       └─────────────┘
                                  │                   │
                                  ▼                   ▼
┌─────────────┐       ┌─────────────────┐    ┌─────────────┐
│ DESPETCH TO │  ◀─── │ TCF (TRIM       │ ◀─ │  PAINT SHOP │
│ CUSTOMER    │       │ CHASSIS FINAL)  │    │             │
└─────────────┘       └─────────────────┘    └─────────────┘
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There are many activities which directly or indirectly affect on manufacturing of a product. The activities which directly affect are called value added activities. And those activities which are not directly involved in manufacturing of a product but indirectly affect on a product and mainly product cost.
Product Manufacturing Cost = (Material Cost + Processing Cost + Over Head Cost + Others)
Where, Over Head Costs are
1. Electricity
2. Telephone
3. Services etc,

And

Profit = Selling – Manufacturing Cost

So, if Over Head Cost will reduce then Product manufacturing Cost will decrease and If Product manufacturing Cost will reduce then profit will increase.
So these activities are more essential for a product. These activities called non value added activities.

VALUE ADDED ACTIVITIES	NON - VALUE ADDED ACTIVITIES
1. Material required for vehicle manufacturing 2. Design of product 3. Machine requirement 4. Customer requirements (Market study and advertisement) 5. Training to labors 6. Product development 7. Human Resource 8. Production process	**A) TECHNICAL ACTIVITIES** 1. Material Handling / Movement and storage 2. Mechanical ARC (Annual Rate Contract)– Fabrication contract, machine errection and commissioning 3. Electrical ARC 4. Annual maintenance contract (For machineries equipments **B) NON–TECHNICAL ACTIVITIES** 1. Conservancy – total 2. Security – Plant 3. Canteen and pantry services

My scope of work is 'Standardize the document' in different **ACTIVITIES of ESM (EXTERNAL SERVICE**

MANAGEMENT
Introduction of ESM (External Service Management) Planning
MM External Service Management (MM ESM) is an application component within the materials management (MM) module. It provides a basic process for the procurement of externally performed services. It supports the complete cycle of purchase requisition, RFQ & quotation maintenance, purchase order creation for services, acceptance of Services through Service entry sheet, as well as the invoice verification process. MM External Services Management is completely integrated into the Materials Management system.

The basic process comprises the following functionality:
Service Master Records
In which descriptions of all services that may need to procure can be stored. The master data for the procurement of services can be stored in Service Master Records, for example, which subsequently provide default data for the purchasing documents.
MM (MATERIAL MANAGEMENT) External Service Management offers two basic ways of specifying Services:
1. PLANNED SERVICES
a) Planned Services with description, quantity and price.
b) By "Planned Services" we mean Services whose nature and you know scope at the start of a procurement project or transaction.
c) At the time the Services are requested, the individual specifications are entered either with the aid of a Service Master Record or directly as short and long texts. Price and quantity are specified in both cases.
2. UN - PLANNED SERVICES
a) With the setting of a value limit only.
b) By unplanned services, we mean Services that cannot be specified in detail because their precise nature and scope are not initially known, or Services which-for various reasons - you do not wish to plan. Unplanned Services therefore have no descriptions.
c) They are entered in the form of monetary limits. Services may be performed up to a value not exceeding these value limits. This allows you to exercise a degree of cost control in such situations.
d) You can record the performance of Services or work in **Service Entry Sheets.**
e) You can indicate your acceptance of the work set out in the entry sheets in various ways.
f) Following acceptance, the vendor's **Invoice** can be verified and released for **payment**.

III. Identification Of Problem
2.1 Identification of Problems through Fishbone Diagram for Conservancy
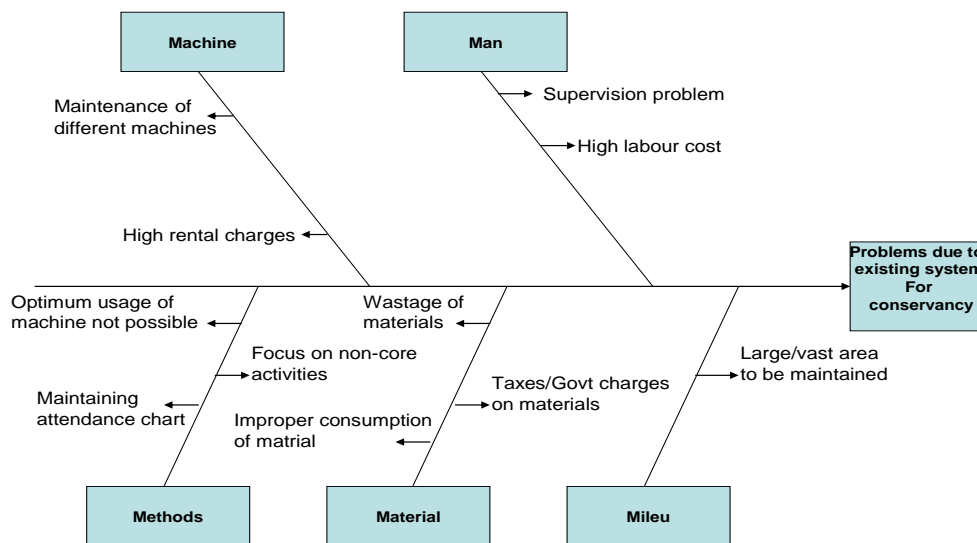

Fig.2 Fishbone Diagram or Cause-Effect Diagram

Following are the problems due to existing system. As project stage, due to existing system these problems may affect directly on productivity and quality of plant in future.

1. Company provides the housekeeping material to agency, it is seen that consumption of material is more than expected and accountability of the agency is less. Efforts from agency to use housekeeping material best to use are less.
2. As this is the project work of upcoming plant, housekeeping requirement would be gradually increasing, the complete allotment of the plant for housekeeping would be unnecessary wastes / loss to company.
3. Lack of efficiency while working and special focus on key area. Access to agency for immediate work and specific job.
4. Day by day labor cost is increasing and so work cost are high affecting productivity and profit of company.

PROBLEM POSSIBLE SOLUTIONS THROUGH ESM
Problem I
As this is the project work of upcoming plant, housekeeping requirement would be gradually increasing, the complete allotment of the plant for housekeeping would be unnecessary wastes / loss to company.

Solution I
For this problem, we can take services from supplier with construction of each shop. That is first we will decide for those shop, where people will be shifted i. e. temporary offices. And then we will decide for cleaning of machines. After all we decide for entire plant (roads, office area, all shops etc.).
By this decision we can save
1. Charges of machines which are not installed in shops
2. Charges of roads cleaning
3. All another shops which are not constructed
So we will take decision with construction.

Problem II
Lack of efficiency while working and special focus on key area. Access to agency for immediate work and specific job.

Solution II
By solving this problem we can improve quality. More quality can be achieved if we decide different parties for each shop than to engage all shops to only one party. Because the area being large and also keeping in view the specialized cleaning requirement of various shops. It is suggested to employ 2-3 parties for cleaning of the various locations within the plant. The advantages of employing more than one party are as under-
- Employing the parties as per their strengths.
Ex- Shop floors especially paint shop, office area, roads etc. It will generate a healthy competition among the parties to perform better. It will give better control over the parties.
Any one of the parties can be asked to take on the responsibility of the other at very short notice without compromising on the quality. Such a situation can arise if a party is having employee problem or if the party wishes to discontinue with very short or no notice.
In view of the above the suggested job distribution of parties are as under-
Party No 1:- Shop A + Common areas
Party No 2:- Shop B + Shop C + Shop D
Party No 3:- Shop E + Office area + Roads includes Speed Track
This analysis can be done by three ways.
1. Time
2. Cost
3. Number of persons
1. Time analysis
We can save time of labour and supervisor assigned for housekeeping.
2. Cost
Cost can be realized in following ways.
1. We can save chemical cost.
2. We can save machine cost.
3. Total cost – Total amount will be Rs. 369384.7 per month instead of Rs. 451227.9 per month so we can save Rs. 81843.2 per month.

2.2 Identification of Problems due to existing system, with the help of fishbone diagram
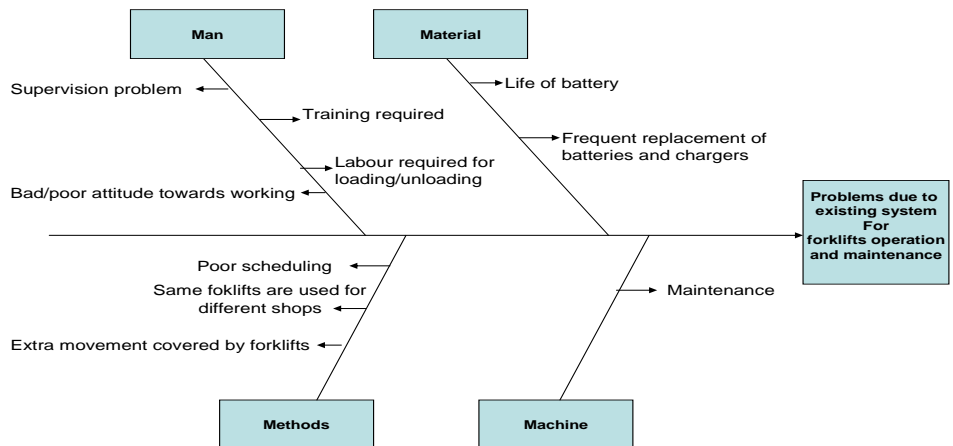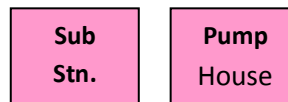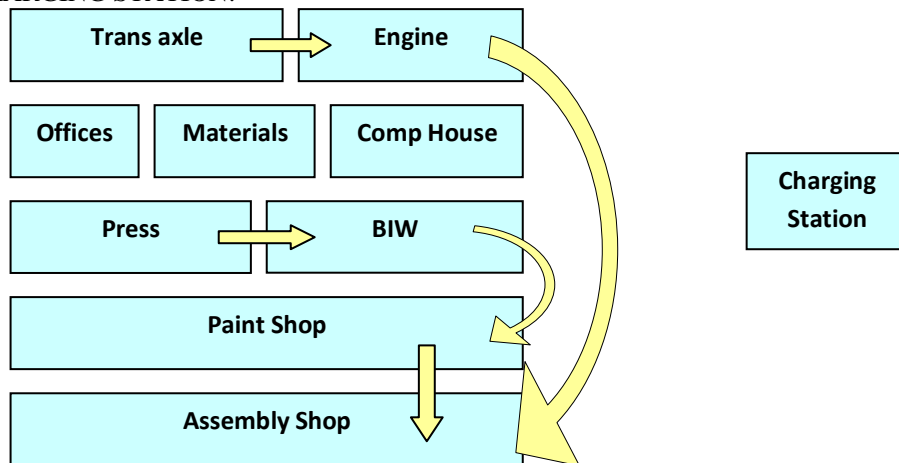

Following are the problems due to existing system.
1. Problems in charging station
2. Under utilization of forklifts
3. Problems in battery maintenance

PROBLEM I
PROBLEMS IN CHARGING STATION:

Following problems are faced in charging station.
   a) Unplanned Schedule
   b) Extra movement of forklifts

a) Unplanned Schedule:
    Due to improper scheduling, all forklifts from different shops arrive for charging at the same time at charging station. But, due to limited number of chargers, many forklifts wait in queue. To avoid this, proper schedule is to be prepared for different forklifts, and the same is to be followed meticulously to avoid overlapping of forklifts for charging and better utilization of forklifts.
b) Extra movement of forklifts:
     According to this study all drivers move to charging station whenever they get time. This results in unnecessary movement of forklifts, and by following table we can understand that productivity decreases daily. So by proper scheduling, we can avoid this problem.

In the table below, it is clear that 30.6 Kms is covered unnecessarily, by 20 forklifts everyday for charging.

Location	No of forklifts	Total distance for per trip	Extra movement per day per forklift	Total Extra distance in Kilometers for per day
Charging station - Transaxle shop	3	0.4	6 times	7.2
Charging station – Engine	4	0.2	6 times	4.8
Charging station - Press shop	3	0.3	6 times	5.4
Charging station – BIW	4	0.2	5 times	4
Charging station - Paint shop	1	0.2	6 times	1.2
Charging station - Assembly shop	5	0.4	4 times	8
Total	20		38 times	30.6

PROBLEM II
UNDERUTILIZATION OF FORKLIFTS:
The below table shows that, due to this unplanned activity, the forklifts are falling short of their required trips every day. The forklifts are underutilized.

S.N.	Area	Location	Required Trips per day per shift	Trips per day per shift
1	Transaxle shop	Front of line	30	26
2	Engine shop	EOL to Pallet storage area	55	50
3	Press shop	Press shop to BIW	40	37
4	BIW	EOL to Pallet storage area	100	90
5	Paint shop	Press shop to *Weld* shop	30	24
6	Assembly Shop	General purpose	40	35
	Total		295	262

Preparation of justification, by proper analysis of all options
This analysis can be done by three ways.
   1. Time
   2. Cost
   3. Number of persons

Time
  We can save time of all people, associated with material movement and movement with forklifts.
   1. **Cost**
        Cost savings can be realized in the following ways
           a) Battery cost – We can save 24 Lakhs per year.
           b) Overall cost – By saving battery life and through proper maintenance, we can save life of forklifts. And so overall cost will increase.
   2. **Number of persons**
        By implementing above solution, we can save large number of manpower.
   Example
   • Supervisor
   • Manpower for maintenance
   • Manpower for operation

IV. Conclusion

1. ESM is used effectively to improve productivity of plant operation.
2. Quality of process & quality of work can be improved through properly defining scope of external service provider.
3. By defining value added activities and non-value added essential activities, we   can focus on core activities of organization.

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