Skill and Competency Mapping: a Tool for Training Need Identification through Six Sigma

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ABSTRACT

Human Resource Management is a process which binds the organizations and people together so that the goals of each other are met. Currently, skill and knowledge are demanded by the jobs, which call for future Skill Mapping through HRM initiatives. This research paper recommends a set of training need after the evaluation done with the help of Skill Mapping through six sigma.

This paper draws attention to a fact that while mapping the specific skills of the operators in Turbo Gears India Pvt. Ltd., there was a gap between the actual and required performance. This was the barrier affecting the individual development of the employees. From the analysis done through six sigma, it was easier to identify the areas of low performance. These problems can be solved by providing proper training and mentoring the operators, which in return will help them to increase their skill and efficiency. In order to increase their growth graph, the operators skills were analysed and key competencies were identified. Questionnaire and tests can be conducted to decrease the degree of biasness, which will help to create s similar opportunity for every operator. Training programs can be arranged with defined periodicity to ensure that the limitations don't increase and later help the operators to work effectively and efficiently.

Keywords - Skill Mapping, Competency Mapping, Six Sigma.

1. INTRODUCTION

1.1 Importance of Skill Mapping

Earlier days the organizational success depended on physical and financial assists, but today the success solely relies on its intangible resource, which is the human capital. Employee competency is acting as a catalyst in order to attain sustainability in today's competitive market. Skill Mapping is defined as a standardized requirement or a technique utilized to study and analyses the skills possessed by the person or employee for their effective and efficient development.

Now a days, Indian organizations are also witnessing the need for skilled labour due to changes in the systems. It highlights training needs for the most important resource, i.e., its employees. Every industry in the present scenario is trying to achieve high efficiency and effectiveness in order to survive in the cutthroat competition. Skill and Competency therefore become a focal point in the industries growth. Every well managed organisation should have well defined roles and list of competencies required to perform each role effectively.

Scanning and analysing the external environment for opportunities and threats is not enough to provide an organization a competitive advantage. Therefore, Human Resource Management emphasis on looking with corporation itself to identify its internal skilled factors. A core competency can be easily enhanced by adopting its transparency, transferability, reliability. It is easy to identify and analyse the competency but challenge is in using it effectively and enhancing it at regular intervals.

1.2 About the Automobile and Auto Component Industry

The liberalisation of the Indian industry saw a significant growth in the Indian Automotive Industry. With its strong influence on the country's economic and industrial development it is indeed one of the major drivers of our economy contributing nearly 5% of the country's GDP. It is estimated that this sector provides direct and indirect employment to over 13 million people. With the de-licensing of the automotive sector in 1993, several global players entered the market as a consequence of which the market grew, leading to stiffer competition and a large variety of products for the customers to choose from- currently, the Indian customer has over 30 Auto Original Equipment Manufacturers (OEM's) to choose two wheelers, passenger vehicles and commercial vehicles from; and this is only expected to grow in future.

The 3 major automobile and auto components production clusters across the country are;

- Western Region (Mumbai-Pune-Nasik-Aurangabad)
- Southern Region (Chennai-Bangalore-Hour)
- Northern Region (Delhi-Gurgaon-Faridabad)

1.3 Industry Size and Growth of the Automobile and Auto Components Sector:

This paper talks about the auto component sector, which forms a huge portion of the auto industry.

Out of the total, about 77% of the production (by value) of Auto Components is by players in the organized sector while remaining 23% is by the SSI sector.

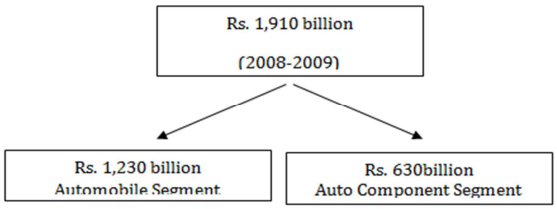

Figure 1: Size of Auto Industry

Size of Auto Component Sector:

SSI Sector- 23%

Organized Sector- 77%

1.4 Skill Requirement in the automobile and Auto Component Sector

The Automotive Industry, by its very nature, has considerable forward and backward linkage and thus employees a significant number of personnel. The society of Indian Automobile Manufacturers (SIAM) has estimated that the Indian Automotive Industry provides direct and indirect employment to over 13 million people. In this research paper we deal with the auto component manufacturers, where 30 to 40% of employment is direct.

One of the key areas at the industry level where the significant gap exists today is the availability of skilled manpower and the problem is not so much in terms of quantity, but more in terms of quality of manpower available. In order to provide for comprehensive growth, it will become imperative to track the enablers of market and industry and at the same time capture and react to the changing skill requirements.

2. COMMON SKILL REQUIREMENTS AND SKILL GAPS: FUNCTION MANUFACTURING

2.1 Level: Head of Department

No	Skills Required	No	Skill Gaps
1	Ability to clearly communicate and ensure co-ordination between various production lines and departments.	1	Tendency to be inflexible and not accept that vehicle production defects may be due to errors committed in the particular shop.
2	In-depth knowledge about automobile and auto components, their subsystems and functions of important parts.	2	Insufficient understanding of automobiles, their sub-systems and functions of important parts.
3	In-depth knowledge about the manufacturing processes within the company.	3	Tending to be narrow minded and resists changes required in the particular shop.
4	Ability to map business requirements into production specifications.	4	Inadequate ability to liaison with various production lines and departments.

5	Ability to clearly communicate and give instructions related to production requirements to supervisors.	5	Inadequate knowledge across all facets of the company's business.
6	To ensure that production levels are met.	6	Inadequate understanding of financial/commercial impact of their decisions related with the particular shop.
7	The ability to guide supervisors/workmen on product/process related queries.		
8	Ability to supervise optimum allocation of resources.		
9	Ability to understand the training needs of workmen and supervisors and help design training programs accordingly.		
10	Ability to effectively communicate with vendors for component/system related issues.		
11	Basic clarity of financial/commercial effect of production methods.		

2.2 Level: Supervisor

No.	Skills Required	No.	Skill Gaps
1	Understanding of latest production techniques, such as lean manufacturing.	1	Inadequate interpersonal skills, leading to inadequate ability to resolve conflicts that may arise between workmen- this causes disruption in smooth production and leads to loss of time, increased cost and inadeqate quality.
2	Ability to ensure that daily production line targets are met.	2	Tendency to be hand-in-hand with the workmen, this reduces discipline.
3	Good knowledge of automobiles, their sub-systems and functions of important parts.	3	Inadequate understanding of end to end processes- supervisors generally tend to know the details only of the productin line they are handling.
4	Ability to understand differences in product lines and platforms and the corresponding ability to direct the workmen accordingly.	4	Inadequate business knowledge/understanding of the commercial implication of wastage.
5	Ability to manage available resources- workmen, raw materials, consumables etc.	5	Availabilty of experienced petrson in this cadre is a concern.
6	Knowledge of concepts such as Six Sigma, Kaizen, TQM, JIT, 5-S is important.	6	Inadequate understanding of quality concepts like Six Sigma, Kaizen, TQM, JIT, 5-S.
7	Ability to allocate suitable work to workmen based on the skill levels of workmen working with them.	7	Inadequate ability to work with or give instructions to workmrn who are more older/have more experience.
8	Ability to resolve conflicts that may arise among the workmen/operators.	8	Inadequate knowledge of product and processes.
9	Ability to ensure productivity by employing		

	efficient processes and maintaing co-ordination on line.
10	Ability to ensure quality by following inspection procedures.
11	Ability to solve issues of workmen without escalating them.
12	Orientation towards wastage minimization, cost reduction and quality workmenship.
13	Strong problem solving, Logical and Analytical skills.
14	Ability to plan and shedule activities.
15	Ability to ensure safety and environmental compliance.

2.3 Level: Workmen/ Operator

No.	Skills Required	No.	Skill Gaps
1	Should have basic literacy, analytical ability and the ability to understand and follow shop floor functions.	1	Tendency to consider only the current activity performed, no understanding of where it fits into the big picture.
2	Should have relevant knowledge of working of systems.	2	Inadequate trade knowledge and its poor application.
3	Ability to operate and/ or maintain both general and special machines.	3	Inadequate desire for learning new skills- working on new machines.
4	Ability to adhere to standard operating procedures (SOP) for all variants/versions on a single platform/across platforms.	4	Availability of drivers, painters and operators for high-tech machines (such as super finishing grinding machines and CNC controlled machines) is a concern.
5	Ability to carry out basic troubleshooting of machines in case of breakdown.	5	Insufficient ability to communicate the problems face during daily routine.
6	Ability to perform operations requiring multi-skills.	6	Tendency to form unions and disrupt regular workings.
7	Ability to minimize wastage of raw materials and consumables, maximize production and understand the impact on cost, quality and time.	7	Insufficient understanding of discipline, industrial rules and work related procedures.
8	Ability to highlight aberrations in daily production process.	8	Absenteeism is a concern in this cadre.
9	Adherence to required quality levels of production.	9	Lack of skill standardization across educational institutes.
10	Ability to follow instruction from supervisors, departmental heads.		
11	Ability to understand and conform to basic shop floor safety practices, such as wearing gloves, being aware of		

dangers of interfering with machine/equipment.

12 Knowledge of assembly line operations, quality management techniques, fabrication techniques, welding techniques, cutting, machining etc.

13 Understanding of drawings, knowledge of usage of instruments, measurement techniques and maintaining tolerances.

14 Knowledge of principles of manufacturing, managing safety at work, Kaizen, Overall Equipment Efficiency (OEE).

15 Be adept in a particular trade.

16 Ability to confirm to work schedules and complete assigned work on time.

17 Maintain discipline, punctuality.

2.4 Introduction: Turbo Gears India Pvt Ltd.

The Euro Carraro Group from Italy has a new venture, Turbo Gears India Pvt Ltd near Pune to start commercial production of gears and components for the automotive industry with an investment of 20 million Euros. Turbo Gears India Pvt Ltd expects the turnover to reach 30 million Euros or Rs 165 crore with over 450 employees on the staff. Current products manufactured are Satellite gears, ring gears, wheel carriers, PTO shafts, secondary gears, forward reverse gears, secondary shafts, covering gears, long shaft ground gears, ground satellite, double gear, lay shaft gear, timing gear etc.

The company included various departments such as production, heat treatment, quality assurance, met lab, logistics, maintenance and tool room.

Skill Mapping in Turbo Gears was done for the operators, their levels were decided on the following skills:

- Knowledge about the operation.
- Knows the quality policy and quality norms.
- Reports deviations and takes corrective measures.
- Knows the safety policy of the company when on the shop floor.
- Is able to identify the problem.
- Ability to train other operators.

3.1 Heat Treatment Department

2.5 Skills Mapped in the Process

- Knowledge about the operation
- Can analyse the problem
- Can independently solve the problem
- Can suggest corrective measures
- Can train other operators

3. ANALYSIS OF DIFFERENT SKILL OF THE EMPLOYEE WORKING IN DIFFERENT DEPARTMENT BY USING SIX SIGMA (P CHART)

The skill mapping is done for the employee working in seven different department using six sigma tool of identifying the defectives (“P” chart) the sample size is 50 worker from different department working on different operations of the company the analysis is shown department wise. To calculate the performance of the employee the performance of the employee is rated in the scale of “0” to “5” the average is calculated for each activity for each worker and then the average is taken of every activity to identify the defectives in the each process of the department.

n = average of total sample size

$$p = \frac{\text{Total no. of dissatisfied}}{\text{Total sample size}}$$

Operation	Furnace Monitoring	Induction Hardening	Straightening	Nit riding Furnace Monitoring	Shot blasting	Shot peening	Magnaflux Machine
Sample size	20	25	30	9	42	23	23
No of non-performers	5	12	8	0	0	0	7

n=25

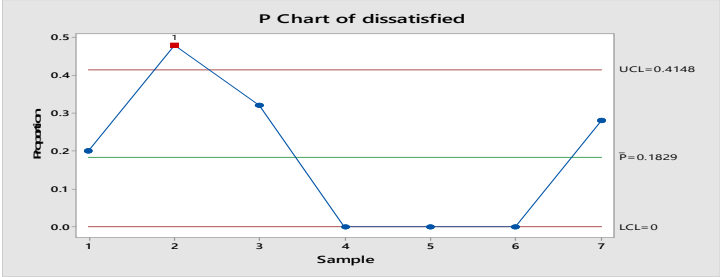

Figure: - 1

Note: - Number of non-performers in induction hardening department are on very high calls for future investigation

3.2 Production Department

Sr. No	Operation	Sample Size	No of Non-performers	Sr. No	Operation	Sample Size	No of Non-performers
1	ID Grinding	53	18	10	VMC	16	0
2	Reischauer	7	0	11	Chamfering	114	6
3	Washing	5	0	12	Shaping	108	9
4	Turning	29	9	13	Samputensili	13	0
5	Gun Drilling	17	0	14	Assembly	5	0
6	Roll Testing	8	0	15	Roofing & Rounding	21	5
7	OD Grinding	38	19	16	Drilling	20	2
8	Broaching	10	2	17	Hobbimg	121	6
9	Reaming	10	0	18	Shaving	109	14

n =39

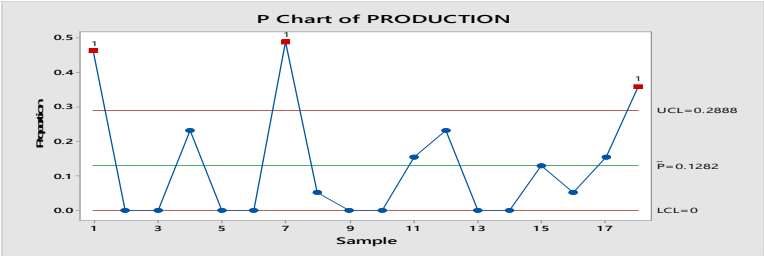

Figure: - 2

Note:- Number of non-performers in production department are on very high call for future investigation

3.3 Met Lab Department

Operation	Metlab
Sample Size	7
No. Of Dissatisfied	1

n=7

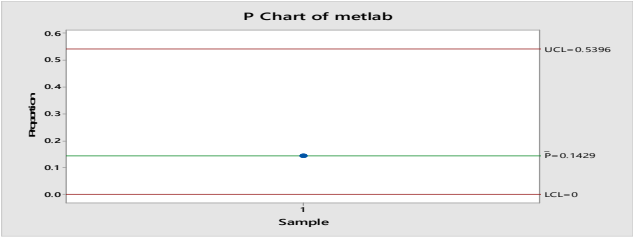

Figure: - 3

3.4 Tool Room Department

Operation	**Shaver**	**Hobbing**	**Shaper**
Sample Size	5	6	6
No of Dissatisfied	0	0	0

n=6

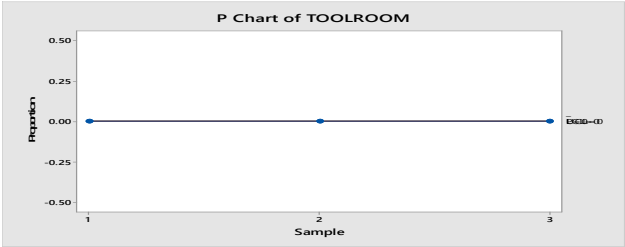

Figure: - 4

3.5 Maintenance Department

Operation	**Electrical Maintenance**	**Mechanical Maintenance**
Sample Size	**4**	**6**
No of Dissatisfied	**0**	**0**

n=5

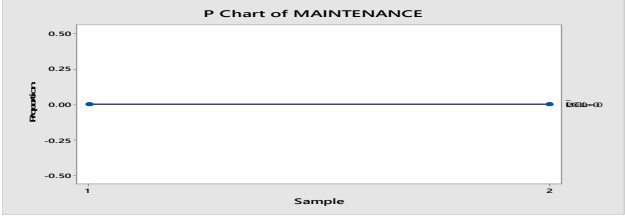

Figure: - 5

3.6 Logistics, PDI/QA

Operation	Logistics	PDI/QA
Sample Size	5	18
No of Dissatisfied	0	0

n=11

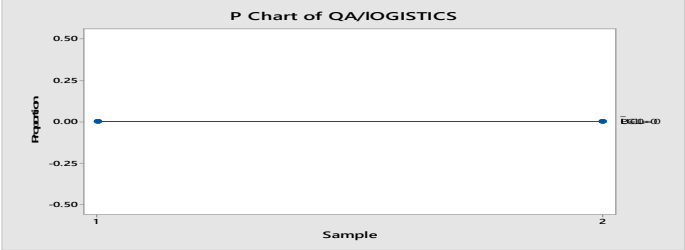

Figure: 6

Note: - Figure 3, 4, 5, 6 have a stable condition and require no future investigation

4. CONCLUSION

The Skill Matrix process helped to analyse the gap between the actual and required skills for a particular area of operation. The ratings obtained has helped to deploy an employee to a particular level in the concerned operation. It has also be beneficial for taking corrective actions to enhance the skills of the employees and thus leading them to a higher level. This in short will lead to an increase in the number of skilled labour.

The NP chart obtained by Six Sigma helps to reduce the level of defectively and make the process error free. There has been lot of initiatives taken up at TGL towards Human Resource Management. The Competency Mapping Process is for Shop floor employees to increase their efficiency and effectiveness to perform particular work. Six Sigma thus helped to analyse and identify the drawbacks in the skills required.

Further based on the data obtained for Training Need Identification, Head of the departments and the supervisors should consult to the HR for training on selected fields of operations. Thus this entire process helps to enhance personal growth of the employee along with its organization.

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