Training Needs Assessment using Skill Gap Analysis

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Abstract

The research provides inputs to the company to design a training plan which will bridge the existing skills gap in the organization. To analyze the skills gaps, construction of skill inventory of organizational capabilities is necessary, which can help the company determine whether it can deliver a particular product on time or service the client efficiently. The study was carried out at Marico Limited, Jalgaon, (MS), India with the workmen of two sections i.e. refinery and filling section which constituted 18 refinery workmen and 42 filling workmen. The total sample is divided according to the job families. The current skill inventory is identified using questionnaire based on the key skills of workmen required for each job cluster. The expected skill inventory is identified by interviewing the supervisors and managers. The skill gap is analyzed by comparing the current skills with the expected skill set. The results revealed that the refinery workmen need more knowledge of cost losses due to loss of the material used for refining the oil. To reduce the breakdowns in the plant the filling section workmen need knowledge in the breakdown analysis methods. All the workmen need to improve on the knowledge of importance of the various business processes in the organization. The study suggested some useful measures for the successful planning and implementation of the training sessions. The research methodology employed in this article can be used in many different organizations. The results and suggestions are limited to the Jalgaon Plant of Marico Limited.

Keywords: Training and Development, Training Needs Assessment, Skill Gap Analysis, Skill Inventory

1. Introduction

The growth and innovation of any organization is ultimately dependent on an engaged and competent team who are committed to improving organization’s performance. Training
the employees has a significant role in modern business era. Not just to equip them with latest tools the company has implemented, there is a lot more to it.

The training helps the organizations to manage the change. The training need can occur when the technology changes, when the productivity or efficiency of the workers declines, when the organization fails to achieve the desired objectives. There are many reasons for which training can be designed. The assessment of training need helps the organizations to achieve its goals more effectively. There are many ways to identify the training needs. One component of needs assessment is a Skill gap analysis. Skill gap analysis helps understanding competency deficiencies to determine training priorities.

The project helps Marico Limited, Jalgaon plant’s HR team to design the training calendar for the year. The skill gap analysis is carried out for the workmen in the plant to assess the training needs. The assessed gap in the skills of the workmen will be the input to the training plan of the company, which will increase the knowledge of the workmen regarding the core skills of the business.

1.1 Objectives of the Project

- To construct a skill inventory of workmen
- To identify the skill gaps and future skill needs based on business requirements
- To provide inputs to the E & T team to design the training calendar

1.2 Population and Sample Size

**Population:** Marico’s Jalgaon plant employs 43 staff members, 76 workmen and around 200 contract labors. The population strength for the project is the number of employees in the plant along with the workmen and some casuals. There are three main sections in the plant where the workmen are employed along with the casuals and the executives.

**Sample Size:** For the purpose of project, the skill gap analysis is done only for the workmen of two sections i.e. refinery and filling section. So the sample size is 60, 18 refinery workmen and 42 filling workmen.

**Scope of the Project:** The study and design is applicable to the workmen of Marico Limited, Jalgaon during the year 2008-09. The skill inventory and skill gap analysis is valid for the workmen of the Jalgaon plant of Marico. Hence the suggestions are applicable to construct a training plan for workmen of Refinery and Filling Section of Jalgaon plant of Marico Limited.
1.3 Limitations of the Project

- The project only focuses on the skill gap analysis of the two main sections in the company. The analysis can be extended for the workers in maintenance section as well as for the staff which includes the executives of each section.
- The tests are limited for only the main skills. There are many skills the workers need to be learned for better attainment of the goals.
- The tests used for analysis can evaluate only theoretical knowledge of the workmen. There should be some on the job tests to evaluate the practical knowledge of the workmen.

1.4 Need of the Project

Properly trained and highly skilled human resource is perceived as the greatest asset of any organization. Skilled personnel contribute to efficiency, growth, increased productivity and market reputation of an organization. The degradation in growth of any organization arises due to degradation of the productivity of employees. To improve the productivity training is needed.

The company needs to prepare a training calendar for the next year. For this purpose skill gap is needed to be found out, using which they can assess the training needs to train and develop the workers on the core skills required for the prosperity of business. For skill gap analysis the skill inventory of existing skills is to be prepared, which will show the current skill levels of the workers.

The company requires improving the efficiency and productivity of the workers by identifying the training needs. The analysis of skill gaps is required to find out the areas where training is needed. The project will provide the organization with skill gaps, training needs and inputs to the training plan.

1.5 Relevance of The project

Training and development activities can increase the capabilities and abilities of most organizations. The project is useful for the organization to align the skills with organizational needs effectively. The skill gap analysis helps to identify the skill gaps and any shortfalls in talent in any particular area. It provides inputs to design the training plan which can be used to bridge the skill gaps and improve the skills of the workmen through training, which will improve the productivity of the workmen.
The study also helps the organization to know the workmen better and to decide upon the engagement of the workmen appropriately according to their skills. The training plan designed on the basis of the gaps found in the project, will improve the skills of the organization and help them to enhance the quality of the product as well as the quality of work environment.

2. Methodology
The following flow diagram explains the procedure of acquiring the results on skill inventory and desired skills and analysis used to analyze the skill gaps. The procedure described below helps to achieve the following objectives of the project.

- To construct a skill inventory of workmen
- To identify the skill gaps and future skill needs based on business requirements

Identifying Job Family clusters: The main jobs are identified on the basis of criticality of the jobs. There are two main sections in the plant, refinery and filling. The refinery has four main processes through which the oil is refined. These processes are considered as a different job. The jobs in refinery are Dewaxing, neutralization, bleaching and Deodorization.
Identifying the activities and deliverables for each job: The activities to be performed by the workmen for each job are identified by reviewing the procedures and processes. An exhaustive activities and deliverables list is made for each job in consultation with the respective executives and reviewing the SOP as well as the daily Log Books of each section. The log books contain information about the daily activities of the workmen, the critical control parameter values, the maintenance of machine and they need to fill it daily, which is later checked by the executives of the sections.

Identifying critical skills for each Job: The skills are identified for each deliverable through communication with the executives. The critical skills are identified by making the deliverable verses skill maps. The maps show the skills required for each deliverable. The critical skills for the refinery section, to accomplish each task or deliverable all the skills defined are critical. The machine knowledge is required almost for each deliverable. The CCP and Quality knowledge is required for only one or two deliverables. Since all the deliverables are important to be achieved these skills are critical for the jobs. The filling section’s deliverable verses skill maps show that the knowledge of machine, CCP and troubleshooting are the critical skills for each job.

Evaluation of Current Skills and Levels: The current skills are evaluated using questionnaire as an instrument. The questionnaire is made in accordance with the critical skills identified in the above step for each job. The questionnaire is also made for evaluating the workmen’s knowledge about the business processes of the organization. In the refinery the workmen were given the tests for their job areas. If a workman works on two stations, he was given tests for two stations. There are four refinery operators who take care of the operation of all the processes; they were given tests for all the jobs.

The filling section has different jobs in all the three lines as mentioned before. The workmen working on the three lines are given same tests. The questionnaire is also made in Marathi since the workers do not understand English language.

The current skill levels are identified for each workman for each skill. The average levels are identified for each station of the two sections. The evaluation of workmen using questionnaire or tests gives the existing levels of workmen. The graphs are developed showing the levels of the workmen for each skill they are evaluated for. For analyzing the skill gaps the average scores are considered.

A) Levels Specification:
The current skills are identified against the levels as specified in the following table.
### Levels Details Particulars

<table>
<thead>
<tr>
<th>Levels</th>
<th>Details</th>
<th>Particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Beginner &lt;br&gt;1. They have knowledge but don’t have experience &lt;br&gt;2. They know rules of performing the work</td>
<td>Needs Training and Experience</td>
</tr>
<tr>
<td>2</td>
<td>Knowledgeable &lt;br&gt;1. They have knowledge and experience &lt;br&gt;2. They know rules of performing the work</td>
<td>Needs Training and Motivation</td>
</tr>
<tr>
<td>3</td>
<td>Proficient &lt;br&gt;1. They have knowledge and have experience &lt;br&gt;2. They know rules of performing the work &lt;br&gt;3. They can apply own knowledge in solving the problems</td>
<td>Needs More Experience</td>
</tr>
<tr>
<td>4</td>
<td>Master &lt;br&gt;They have mastered the skill</td>
<td>Can teach others</td>
</tr>
</tbody>
</table>

**Table 1 - Level Specifications**

**B) The average skill level graphs for refinery are shown below:**

The following graph shows the average of the jobs in refinery section. The graphs show skills around and levels for each skill.

1. From the graph we can observe that all the workers of refinery section have mastered the skill of safety. They are proficient in machine and troubleshooting knowledge and lacking in the skills required for quality product.

![Refinery Average Skill](graph1.png)

**Graph 1 - Refinery Average Skill Levels**

**C) The average skill level graphs for filling section are shown below:**

1. The filling section average graph shows that the workers are at or above level 3 in job related skills but are lacking in TPM and 5S skills.
2.1 Identifying the skills and threshold levels married with business aspirations

The threshold levels are identified through communication with the section managers. The thresholds are based on the objectives and aspirations of the organization for the year 2009-10. The following steps describe how the skills and threshold levels are identified.

1) Understanding business requirements for the year 2009-10

The business requirements are identified for each section individually. The following description shows the business requirement of both the sections.

**Refinery Section**
- Maintaining or reducing the cost of each area
- Improving the quality of the product, safety and environment
- Adherence to the business processes TPM, EMS, MMEM

**Filling Section**
- Reducing Losses in downtime
- Reducing PM losses in filling
- Reducing Energy consumption
- TPM knowledge – JH & PM pillar focus
- Focus on Food law and FSMS
- Focus on ISO – 14000 / 18001

2) Skills of workmen to achieve these requirements

The Skills of workmen which are required to achieve the above mentioned skills are identified.

**Refinery Section**
- Understanding of the cost at each level
• Understanding the CCP which affects the quality of product
• Understanding of business processes TPM, EMS
• The Workmen should become autonomous operators of the work area
• The refinery operators should be at the level four in all the skills and the other workmen should be at level three in all the levels

**Filling Section**

• Root Cause Analysis through WHY – WHY compliance
• TPM – Poka Yoke Kaizens to reduce Losses
• Basic knowledge in electrical power consumption and steps for reduction (EMS)
• JH steps – knowledge of importance (TPM)
• Preventive maintenance
• RCA for Food related risk (FSMS)
• Knowledge of risk assessment / aspect impact analysis / near misses

2.2 Define missing skills to perform the tasks

The comparison between the existing skills of workmen and the desired skills gives the missing skills of the workmen to perform the tasks and to achieve the business objectives. The following interpretation of the existing skills and desired skills gives the missing skills for both sections.

**Refinery Section:**

The graph 3 shows average skills of refinery section. The black bars of graph show the Business processes related skills and white bars show the job related skills.

- The requirements by the business show that the workers should be well versed with the knowledge of CCP and quality as concerned with the actual job.
- And they should have the knowledge of business processes TPM and EMS.
- The management wants the workers to be at level 3 in all the skills and refinery operators to be at level 4 in all skills.
- As we map these requirements on the existing skill maps, we can observe that there is a need to enhance the skills of workmen in all the areas excluding the safety.
- The main skills where the workers are deficient are quality and CCP knowledge. The refinery operators lack in CCP, Quality, machine Knowledge and business processes TPM, EMS, 5S.
The graph shown below describes the availability of skills in descending order for refinery section.

The graph shows that the workers lack skills of TPM, EMS, 5S in business processes and CCP and Quality skills in job related skills.

**Refinery Average Skills in Descending**

The graph shows average skills of filling section. The black bars of graph show the Business processes related skills and white bars show the job related skills.

The requirements by the management show that the workers need Knowledge of risk assessment, aspect impact analysis, Root Cause Analysis through WHY-WHY compliance, TPM, EMS, FSMS.

For Root Cause Analysis requires knowledge of machine and troubleshooting and the workers are at level 3 for these skills which can be enhanced through training.

‘Basic knowledge in electrical power consumptions and steps for reduction’, this skill requirement defines the knowledge of EMS. The workers are needed to be trained in EMS for reduction of electrical use.

They need training in TPM pillars and 5S (part of TPM) since for both the skills they are below level 3.

The graph shown below describes the availability of skills in descending order for filling section.

The graph shows that the workers lack skills of TPM, EMS, 5S in business processes and machine skills in job related skills.
3. Findings

The process explained in chapter 4 gives detailed structure of the analysis of skill gaps. The results and findings are very well explained in the steps of the processing and analysis. There are three sets of findings from the study.

Findings using Tests

The evaluation of each workman using tests states the levels of workmen in each skill. For the purpose of formation of training plan the average skill levels are considered. The average levels for each section show that the workmen are good in some skills and lacking in some skills.

1. The workmen lack knowledge of business processes and its importance for the organization. The results show that they are proficient in the safety knowledge and lacking in TPM, EMS and 5S knowledge.
2. The refinery workmen are proficient in machine and troubleshooting knowledge and lacking in other skills such as knowledge of standard CCP and Quality parameters.
3. In dewaxing the workmen are proficient in troubleshooting skills but lacking in knowledge of quality, machine and process skills.
4. In neutralization the workmen are proficient only in Troubleshooting skills.
5. In bleacher section they are proficient in machine operation but lacking below level in other skills.
6. In deodorization the workmen are at same level i.e. proficient in machine, process and troubleshooting knowledge.
7. The refinery operators are proficient in the machine and troubleshooting skills. And lacking in all other skills. As per the requirements they lack all the skills.

8. The filling workmen are proficient in their job related skills evaluated using the tests. They lack in the process related skills.

9. The automat workmen are proficient in all the skills excluding the machine knowledge.

10. The span pack workmen are proficient in all the skills excluding the troubleshooting knowledge.

11. The pouch filling workmen lack in machine knowledge as well as in the business process knowledge.

12. The other workmen working on stacker and Q cert & audit are master in the job related skills.

Findings from Discussions

The discussion with the section managers to find out the business objectives of the year and desired skills and levels to achieve the objectives, yields following results:

1. The workmen must have the knowledge of the business processes in the organization.

2. The workmen need to understand the parameters which affect the quality of product.

3. The Workmen should become autonomous operators of their work area.

4. The refinery operators should be at the level four in all the skills and the other workmen should be at level three in all the levels.

5. The filling workmen need Basic knowledge in electrical power consumption and steps for reduction in the power consumption.

6. They should have knowledge of importance of the different JH steps in TPM.

7. They should have knowledge of Root Cause Analysis for Food related risk.

8. Knowledge of risk assessment / aspect impact analysis / near misses is required.

Findings from Comparison

From this we get the two results to be compare to find out the skill gap.

1. The main skills where the refinery workmen are deficient are quality and CCP knowledge.

2. The refinery operators lack in CCP, Quality, machine Knowledge and business processes TPM, EMS, 5S.
3. The filling workers lack skills of TPM, EMS, 5S in business processes and machine operation skills in job related skills.

4. The workers should have level 4 in troubleshooting skills for risk assessment.

4. Conclusions

1. Refinery is the most important section of the plant since the quality of oil depends upon the adherence to the standards. To maintain the quality of product the knowledge of quality parameters is important.

2. The refinery operators play key role in maintaining the smooth process flow in the refinery. They should be master in all the skills.

3. The refinery workmen need some knowledge of cost losses due to loss of the material used for refining the oil.

4. To reduce the breakdowns in the plant the filling workmen need knowledge in the breakdown analysis methods such as WHY-WHY Analysis, Root Cause Analysis, Aspect impact Analysis.

5. The knowledge of importance of the business processes is necessary for rapid growth of the organization. All the workmen must know the importance of the business processes in the organization.

6. For long life of the machinery the workmen have to know the maintenance measures through TPM.

5. Suggestions

The company encompasses many procedures and processes for competitive advantage. All these processes are critical for the success of the company. To maintain the world class attitude and its uncommon sense the company’s workforce should be conversant in the work.

After the analysis, observation and interaction with the workmen at Marico’s Jalgaon Plant, following suggestions will be helpful to them to improve their status by improving the workmen skills and competencies.

1. The workmen should be trained in the core business processes of the company. Especially TPM, EMS and FSMS, these processes play a vital role in the success of the organization. They should be educated on ‘Importance of such processes in the prosperity of the organization’.

2. To provide quality product, the workmen need to know the critical parameters affecting the quality. The refinery workmen should be given knowledge about the critical
parameters in the process which help in achieving the quality as per standards. So they should get training on how the change in parameters affects the quality of product and in turn degrade the reputation.

3. After interaction with the workmen, it has been observed that they need some motivational training to increase their level of gratitude and sense of responsibility towards the organization.

4. To meet the objectives of the organization and for social need the workers can be given training on various ways with which the energy consumption can be reduced.

5. The company manufactures edible oil in the plant hence the quality of the oil should be in alignment with the norms. Hence for reducing the food related Risk the workmen should be given training on importance of food safety management system.

6. Under EMS the workmen can be taught the importance of being ‘Go Green’ which will help the company as well as have social impact.

6. **Scope of further studies**

‘Experiments have no end, every research has some extension’. So, even this study of training need assessment using skill gap analysis has no full stop. There are some areas where we can improve the accuracy of the study.

The limitations of the project describe the scope for further studies. The project can be extended in following areas:

- **Sample Size**
  
The sample size can be increased by analyzing the skill gaps for workmen of maintenance department. This will give the skill inventory of all workmen in the plant.

- **Method of Evaluation**
  
For evaluation of the knowledge of workmen only theoretical tests are used. The evaluation of the workmen can be done more specifically by using on the job tests, live case lets, individual observation as well as the performance.

- **Level of Organization**
  
The project focuses on skill gap analysis of the workmen which belong to operational level. The skill gap analysis can be designed for the ‘Executives’ of each department, which are a part of a level above operational level and below the managerial level.

- **Design of Training plan**
  
The project provides inputs to the training plan. Instead of only providing inputs, the project could have designed the training plan.
References
*Standard Operating Procedure (SOP)*, May-June 2009, Marico Limited: Jalgaon.