

Designing of Screening Test for Entry Level Engineers at Sudarshan Chemicals, Pune Under the Sub theme of Conference Human Resources : Talent Acquisition, Management & Engagement

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Abstract:- Selection process plays very important role in screening out most suitable persons at right position.

This paper highlights research work carried out at Sudarshan Chemicals, Pune. Earlier the person with right skills was not placed at right position due to unavailability of screening test. Lots of organizational resources were wasted in inducting and training employees in order to inculcate specific skills in them. Hence, the Researchers have decided to finalize the objectives as identifying the core competencies and specific skill sets to perform the job successfully. The observations, interview and questionnaire method was used to find out the Competencies required by Company based on their experience. Specific Skill sets were finalized by discussing with the employees and technical Heads and understanding University syllabus for required qualification.

Then competencies were matched considering the Job Description. Based on this the Technical and Aptitude Tests were designed to save the time required for the selection of the candidates.

This study has helped to employees in improving quality of work and experience, Job satisfaction..The researchers have suggested the organization to list out the rules and regulations, Cut-offs, instructions for the candidate as well as the examiner required to conduct the screening test. This research work has helped to bring change in the company's ongoing process of recruitment.

I. INTRODUCTION

Recruitment is understood as the process of searching for and obtaining applicants for the jobs, from among whom the right people can be selected. The process begins when new recruits are sought and ends when their applicants are submitted. The result is a pool of applicants from which new employees are selected. Selection is the process of picking up individuals (out of the pool of job applicants) with requisite qualifications and competence to fill jobs in the organization.

The purpose of selection is to pick up the most suitable candidate who would meet the requirements of the job in an organization best, to find out which job applicant will be successful, if hired. To meet this goal, the company obtains and assesses information about the applicants in terms of age, qualifications, skills, experience, etc. the needs of the job are matched with the profile of candidates. The most suitable person is then picked up. Steps in selection includes Preliminary Interview, selection tests, Employment interview, reference and background checks, selection decision, physical examination, Job offer, Final selection.

The Second step of the selection procedure is the **selection test**. Which comprises of the Screening tests as Aptitude Tests, Personality Tests, and Ability Tests, Interest Tests (activity preferences), Graphology Test (Handwriting), Medical Tests, Psychometric Tests etc.

1.0 Importance of aptitude test in selection process:

Aptitude test is the first round of recruitment process for any company in any sector like Banking, Software, Insurance, Pharmaceuticals etc. All the graduates with 60% or above are eligible for the recruitment process and everyone is tested on the same grounds of aptitude. This gives us the clear idea that the companies are giving aptitude more importance than the academic percentages. Basically Aptitude is divided into three categories

i. **Quantitative Aptitude (Arithmetic):** Quantitative aptitude is the concept , which helps to find out the Accuracy of a person and time management.

ii. **Logical Aptitude (Reasoning):**

Logical Aptitude is the concept , which helps to find out the thinking ability of a person.

iii. **Verbal:** It is used to find out the communication skills of a person. That is the reason all industries conducts these tests in their recruitments.

II. LITERATURE REVIEW

The research paper was presented in 2009 at AaeE Conference, Adelaide, by Sally A Male, Mark B Bush, Elaine S Chapman. The University of Western Australia, Perth, Australia, on “Identification of competencies required by engineers graduating in Australia” The research was carried out to find out the generic engineering competencies that engineers graduating in Australia require. Competencies that were likely to be important to engineering work were identified from a broad range of literature. These were rated between 1 to 5 by 300 established engineers as per important to do their jobs well. The results strongly support that these competencies have to be centered in engineering curriculum. Technical competencies are not only sufficient to be a successful engineer but communication, teamwork, professional attitudes, business skills, problem solving, critical thinking, creativity, and practical skills are also perceived as highly important. Such competencies are unlikely to be developed through traditional and non-traditional teaching methods to facilitate the success of engineers as individuals doing their jobs well.

In the article “Mapping Emotional Competencies of Mahatma Gandhi- A biographical Analysis Approach” , Ipshita Bansal, Priti Hingerani states that Competencies play an important role in effective, efficient and well organized work discharge. Mapping individual’s competencies is very important

An article of June 26, 2008 on “Aptitude Test Helps Students Find Strengths” by Meghan Forces Press Services, Washington, describes that Aptitude test any how helps the High Schools Students to find their strengths and weaknesses, understand them and set their goal of life. Aptitude Test also motivates them and helps them to plan their future

The Aptitude test consisted of eight tests that measure strengths in mathematics and in verbal, science and technical skills. The results of the interest inventory and the academic and vocational parts of the test will help students identify suitable career options and identify their strengths. “It can be said that Aptitude Test will help the student identify the skills they need to improve in high school, depending on what they elect to do after they graduate, but it’s really designed to be a useful program for students of all skill levels.”

The Chapter from the book “Basic Human Processes” by Charles Schwab, “Individual Differences, Personality, Skills, and Abilities,” talks about Increasing Self-Efficacy Among Employees, by recognizing self skills which leads to enjoy the work, Achievement, Motivation and Economic Growth Around the World & give excellent Job Performance Linked to Cognitive Intelligence “The ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, and to overcome obstacles with careful thought” . All these factors are very important for the individual’s and Organization’s Growth & Development. Hence, Recognizing ones Abilities and Skills and placing it at appropriate position is of great importance.

III. NEED OF THE STUDY

Earlier there was no screening test conducted at Sudarshan Chemicals. So, the person with right skills was not placed at right position. Lots of efforts needed to be taken on induction and training of employees in order to inculcate specific skills in them. This use to make the selection process time consuming.

Hence, the Researcher has decided to do this research work for:

- Selecting the employees with good aptitude and specific skill sets for the specified job.
- Simplify the screening of the candidates.
- Save the time required for the selection of the candidates.

IV. OBJECTIVES

- To identify core competencies required to perform a job successfully.
- To find out the skills sets required to perform specific job.
- To design the aptitude test and technical test for Engineers.

V. SCOPE

This research work will help the organization to place the candidate with specific skill set at specific job position and reduce time required or the selection of the candidate. It will also help the Employee to do their work confidently, improve quality of work and experience Job satisfaction. Also Employees will enjoy doing their work since they will be placed at right job position.

This research work will help the Researcher to understand the importance of aptitude and technical test and find the skills required to perform specific job and for Designing the aptitude test in order to detect the required skills.

VI. REASERCH METHODOLOGY

1.	Universe	Engineers at Sudarshan Chemicals (52)
2.	Sampling Technique	Simple Random Sampling
3.	Sampling Unit	Chemical, Mechenical, Instrumentation & Electrical Engineers
4.	Sample Size	28

Table 1 : Sample size

A) Population:

Sr. No.	Designation of Employee	Total No.	Sample Taken
1	H.O.D	10	4
2	Engg. (exp 3-5 yr)	12	8
3	Engg. (exp 1-2 yr)	14	8
4	Engg. (exp 0 yr)	15	8

Table 2: categories in sample

B) Details of Sample Size Chosen.

Sr. No.	Designation of Employee	No. Of Department	No. of Employees Taken	Sample Taken
1	H.O.D	4	1	4
2	Engg. (exp. 3-5 yr)	4	2	8
3	Engg. (exp. 1-2 yr)	4	2	8
4	Engg. (exp. 0 yr)	4	2	8

Table 3 : Sample chosen

Data Collection

1.	Primary Data	Data collection was done by using a Field Observation, Interview, and Discussion with employees.
2.	Secondary Data	<p>Secondary Data was collected from-Company Brochure, Website, Research Papers and books.</p> <ul style="list-style-type: none"> The researcher has requested the Technical Experts to frame the questions as per the syllabus and organizations requirement. The researcher has taken the job description for the 4 types of Engineers from the Organization.

VII. DATA ANALYSIS

- Job Discription Of the Engineers Were Studied.
- 12 competencies of sudarshan Chemicals were as follows-

Competenci es	<ol style="list-style-type: none"> 1. External/Internal Customer Orientation 2. Global Mindset-Discipline and Adaptability 3. Effective Communication 4. Planning and Organizing 5. Following Process and Delivering Quality 6. Time and Result Orientation 7. Team Work and Collaboration <p>B) Applicable to only those who have at least one person reporting to him/her.</p>
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8. People Management C) Optional competencies out of which 2 will be chosen by the HOD for his/her own department/Function. 9. Meticulousness/Detail Consciousness 10. Trouble Shooting and Problem Solving 11. Creative Thinking 12. Analytical Thinking
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Table 4 : Competencies required

- The researcher has divided the four types of engineers in three levels depending upon their job experience-

Levels	Experience (years)
Level 0	Fresher (0)
Level 1	1-2
Level 2	3-4

Table 5 : Four levels of engineers

The Screening test is divided into Aptitude and Technical Test. Contents For the Test-

Contents of Aptitude Test	Arithmetic Aptitude, Logical Reasoning, Verbal & Nonverbal Reasoning, Verbal Ability, Data Interpretation.
Contents of Technical Test	University Syllabus, Practical Experiences.

Table 6 : Contents of Tests

The level of employees and the contents for the Technical Test-

Level	Content
Level 0	Syllabus
Level 1	Syllabus + Practical Knowledge
Level 2	Syllabus + Practical Knowledge

Table 7 : Level and Content

Skills required for performing job by different Engineers are screened by observation and studying the job Description are as-

Sr. No.	Chemical Engineer	Mechanical Engineer	Instrumentation Engineer	Electrical Engineer
1.	Knowledge	Knowledge	Knowledge	Knowledge
2.	Analytical Thinking	Analytical Thinking	Analytical Thinking	Finding information
3.	Problem Solving	Problem Solving	Problem Solving	Problem Solving
4.	Critical Thinking	Critical Thinking	Critical Thinking	Critical Thinking
5.	Decision making	Decision making	Decision making	Decision making
6.	Data Interpretation	Data Interpretation	Data Interpretation	Data Interpretation
7.	Observer	Observer	Observer	Creative
8.	Statistical	Numeracy	Creative	Numeracy
9.			Innovative	
10.			Resourceful	
11.			Logical	
12.			Inspecting & Testing	

Table 8 : Various skills required for engineers

Matching of Skills to the Topics of Tests related to Job Description.

Sr. No.	Skills	Topics of Test
1.	Accuracy/ Numeracy	<ul style="list-style-type: none"> Time & work Time & distance Ratio & proportion Allegation of mixture

2.	Focused	<ul style="list-style-type: none"> • Visual reasoning
3.	Analytical/ Problem Solving	<ul style="list-style-type: none"> • Cause and effect • Verbal analogies • Arithmetic reasoning • Sitting arrangement
4.	Statistics	<ul style="list-style-type: none"> • Data interpretation
5.	Judgment/ Decision Making	<ul style="list-style-type: none"> • Judgment • Essential part • Logical Reasoning
6.	Innovative thinking/ Creative Thinking	<ul style="list-style-type: none"> • Out of the box thinking
7.	Observer	<ul style="list-style-type: none"> • Visual reasoning
8.	Knowledge	<ul style="list-style-type: none"> • Technical Test

Table 9 : Skills and topic for test

Sample Questions:

If A + B means A is the mother of B; A - B means A is the brother B; A % B means A is the father of B and A x B means A is the sister of B, which of the following shows that P is the maternal uncle of Q?

- A. Q - N + M x P B. P + S x N - Q
 C. P - M + N x Q D. Q - S % P

Interpretation:

The above Questions are based on “Verbal Analogies” which can detect the “Critical Thinking ability and analyzing skills” of the candidate.

Q11. A train always has

- A. Rails B. Driver
 C. Guard D. Engine

12. Which one of the following is always found in 'Bravery'?

- A. Experience B. Power
 C. Courage D. Knowledge

Interpretation:

The above Questions are based on “Analogies” which is used to detect the “Focus and observation power of the Candidate”.

VIII. FINDINGS

The Findings of the Project are as follows.

- The competencies required to perform the engineering job successfully are added to the competencies of Sudarshan Chemicals.
- The Specific skills set per job are identified for designing the Screening Test.
- The new Aptitude and Technical Test are based on the competencies and skills for Sudarshan Chemicals.
- The Difficulty level of the Questions is proportional to the experience of the candidate.

IX. SUGGESTIONS

- It is suggested that the Cut-Off for passing the test should be decided before executing the screening test.
- The company should list out the Rules and Regulations for conducting the test before executing the screening test.
- The Technical Test should be updated with the University Syllabus and requirement of the Organization.
- Candidate should be well informed about the nature of the test be taken.
- The Examiner should be well informed about the Rules and Regulation of conducting and evaluating the technical test.

X. CONCLUSION

The research work entitled “Designing of screening test for entry level Engineers” was done at Sudarshan Chemicals, Pune. Sudarshan Chemicals did not have any screening test as a part of the selection process. As a result lot of time was consumed more in the selection process. Hence to save the time required for the selection process the researcher has found out the Knowledge, competencies and skill sets required by the Engineers to perform their job successfully and designed the Aptitude test and Technical test based on the Knowledge, Competencies and skill sets. This Screening Test would provide the organization with quality Engineers.

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