

IJRTBT | A Methodical Approach to Job Analysis in a Typical Indian Manufacturing Organization

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Abstract

Job analysis is an important process that can help organizations to improve a variety of functions that are performed. The method that can be adopted for job analysis varies from simple qualitative technique to detailed quantitative one. Whereas theoretical concepts provide inputs on all these techniques, in practice, many of the detailed methods are either not adopted or used only remotely in most of the organizations. The paper deals with a practical case of an electronic equipment manufacturing organization depicting the process of job analysis through work break-down structure and ranking of the job elements.

Keywords: *Job Analysis; Manufacturing Organization; Job Elements*

Introduction

'Profit' is one of the key aspects that is planned, reviewed, and analyzed by every organization on a continuous basis. There are several areas that can be analyzed to know whether those areas can also pave way for profit improvement, directly or indirectly. In the services sector, it is acknowledged that the management of human resources is a crucial factor. This is attributed to the fact that the services offered, and the supplier of these services, are, to a large extent, interconnected (Alneyadi et al. 2019). A large-scale electronic equipment manufacturing organization (Gram Electronics Limited) has its manufacturing and marketing offices in ten locations in India. Though the company has been having 17 percent of market share for the categories of electronic goods that it manufactures and markets, it faced reduction in profits for two consecutive years. As the situation might worsen the Managing Director made a lot of analysis. For one such analysis, he called the General Manager (HR) and sought a scientific comparative report on year-wise manpower availability *vis-a-vis* requirements for five years for the various positions / designations the company had. The objectives were to study the work content of employees at various levels and balance it among them, by adding, transferring, or dropping

work content based on the report so that efficiency of the employees can in turn be balanced better at all the levels.

The General Manager (HR) of the organization had been catering to all divisions through effective selection, recruitment, and transfer of employees as per the manpower requirements forwarded to him by the divisional heads. Though he presented the consolidated report on the requirements that he received from divisional heads and tabulated and the quarter-wise recruitments that he made along with the details on his working, the Managing Director was not satisfied. He sought a more meaningful report that would be in line with his proposed objective. Therefore, the General Manager (HR) planned and asked for a self-job analysis report from the 259-management staff of the organization. He gave a brief 5-line hint (through a circular to all the employees) on what is expected in the report. He mentioned that the report should indicate the time taken by the employees for the different jobs that they perform.

Literature Review

Job analysis

Job analysis in organizations enables one to clearly understand the nature of activities performed by the employees, the relationship of activities with other jobs (Robbins, 2007) and reveals to the management the skills and abilities that one should possess (Robbins, 2007) and the provides information to frame job description (Dessler, 2013) that is to be provided for the corresponding position. In recent times, many organizations are taking attention about the importance of employee performance, to increase employee performance and to find out the methods of achieving high level of employee performance for their organizational success (Aye, Ameen & Nusari, 2019).

Job analysis is a method by which the job is systematically broken into elements. As mentioned by Edward et al. (1983) and Werther & Davis (1996), different methods can be used to do job analysis. For example, observation, interview, self-recording in diary, questionnaire, check list, and so on are some of the methods. Each method has merits and demerits. Some methods can be easily administered while the others are rather laborious. Some provide near-precise information, whereas the other methods only some rough picture. Certain methods are useful for manufacturing organizations, while the others can be more suitable to service type of situations. Many of these methods can be used for lower-level jobs only. Selected few methods can be used for middle and higher levels/positions. Making an ideal choice of the suitable method itself can be challenging.

Despite the widely varying nature of the methods, if job analysis is performed in organizations by any of the systematic methods, it will be very useful for the several functions of the organizations

such as recruitment & selection, employee training, performance evaluation, transfers, organization restructuring, etc. Purposes and uses of job analysis have been analyzed by several researchers. Work done by Clifford (1994) is one such significant contribution in this regard. It is not that only the HR department benefits out of it; even the divisional heads reap dividends (in terms of right number and quality of manpower) for their divisions. Adam & Ben (2018) have also mentioned about the two credentialing programs in job analysis (committee-based methods & inventory surveys).

Effect of job analysis on several aspects of the organizations has been researched. For example, job analysis and organizational performance are related (Suthar, Chakravarthy & Pradhan, 2014) and hence job analysis can be of significant interest to top management. This is, perhaps, why the Managing Director of the Gram Electronics wished to delve into job analysis. Positive effect of job analysis on recruitment and selection was found by Kshatria (2016). Influence of job analysis on factors such as industrial occupation (Hong & Lin, 1995) and industrial training (Campbell, 1989) has also been established. Yet, many organizations do not pay adequate attention or use scientific methods to do job analysis in a systematic manner. In very recent research by Margaret & Catherine (2021) explored about the job analysis with respect to School librarians with respect to student learning.

Organizations worldwide in today's industries face challenges with the globalization of the economy and the growing marketplace (Al-Suraih et al. 2020). In many other organizations, it is done only in peripheral manner. Gram electronics too was not paying tangible attention to job analysis, until the managing director gave a direction to the General Manager (HR) to bring the report as stated above.

Preliminary Information / Responses

Most of the employees listed their jobs in their report and indicated the estimated time (per week) that they took for each of the jobs. Many employees listed just four to five major functions and not 'all the actual jobs. Some indicated only a couple of major jobs and gave 'some ad-hoc 'percentage of time for each. Only a very few had listed the small jobs as well; but even those lists were not exhaustive. One of the planning officers of the organization who was working on a short-term project realized the significance of the exercise that was called for and recalled the different theoretical knowledge on job analysis that he had earlier acquired. Then, he performed a detailed systematic job analysis for an eight-month project-related job that he was performing at that point in time. The method and the outcome were found by the General Manager (HR) and the Managing

Director to be very different from others and systematic. It was also found to be an apt method for the time frame within which the report was required.

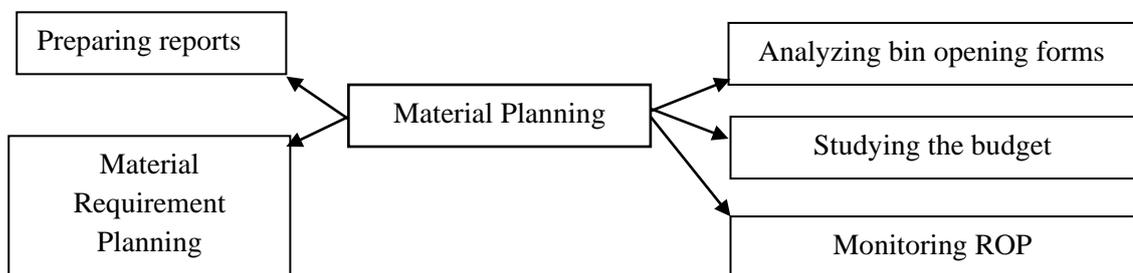
Methodology

The method that was used to do job analysis is as follows: It adopted a ‘ranking cum time-allocation’ technique. The list of codes and the elements of the job are given below. The steps applied for self-job analysis were: (a) work break-down structure (identifying job elements) (b) allocating time for main jobs & job elements. Qualitative semi-structured interview was conducted among six executives who had prior experience in each of the functions / jobs. Only a sample-structure and some elements & time calculations for the elements of one of the jobs are depicted in this paper, since covering all the jobs and corresponding elements along with time calculations will run to several pages and appear unwieldy.

(A) Work break-down structure

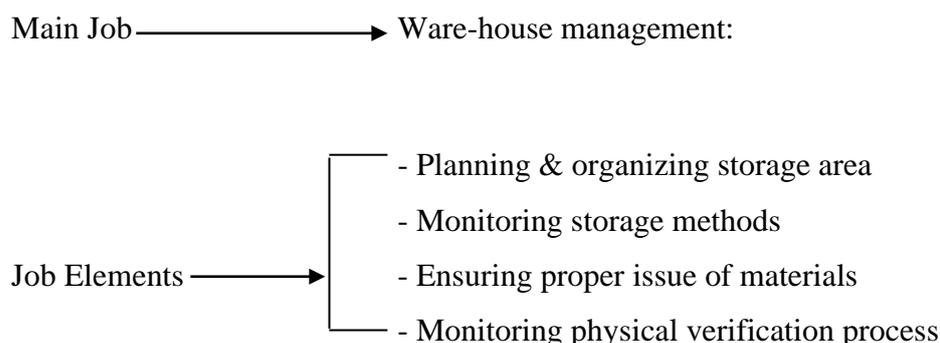
- i. First, major / main jobs were identified e.g., material planning, material control, customer service, computerizing warehouse management etc.
- ii. Then various job elements for each of the main jobs were noted in a rough form as given in the figure 1:

Figure 1: Job elements for the job: ‘material planning’



- iii. These job elements were written down in an order against the corresponding main job. For example, for ‘warehouse management’, it was done as given below in figure 2.

Figure 2: Work break-down structure



(B) Ranking and time allocation

- i. Then, time was allocated for the main jobs and job elements. Time spent on any job was considered to depend upon the following factors (based on prior experience):
 - Priority (urgent/normal/etc.)
 - Importance (vital/essential/desirable/etc.)
 - Nature (difficult/easy/moderate/etc.)
 - Frequency/duration (rare/frequent/time consuming/etc.)
- ii. Each of the main jobs was ranked based upon the above factors.
- iii. Suitable approximation and rounding-off procedures were done to allocate time for the main jobs
- iv. Then, the above exercise was repeated for the job elements, keeping in mind the time allocated for the main jobs.
- v. Thus, the self-job analysis was completed.

Result**(A) Job elements**

The list of small job elements (for each of the jobs) that were arrived at after forming work break down structure is consolidated below along with the codes.

I. Material Planning

- Analyzing the bin opening forms and decision making regarding opening bins
- Deciding/fixing up material planning parameters like minimum Batch quality, lead time etc.
- Studying and analyzing the budget/product plan provided by concerned divisions
- Material Requirements planning /Fixing up levels for consumption
- Monitoring ROP Review system
- Re-ordering/planning order quality and delivery schedule/locally bough out/imported items
- Monitoring preparation and issue of cost copy by analyzing information received on
 - engineered Items
- Preparing and projecting various reports
- Advising bar-rate to feeder shops
- Attending inter-departmental meeting on requirement/material plan

II. Material control

- Monitoring the posting of documents and trouble shooting
- Flowing up pending requisitions/orders with purchase and shops
- Liaising with purchase/shops for problem solving
- Controlling material issue by scrutinizing issue documents

- Analyzing non-moving, slow-moving, and excess stock inventory and deciding action plan
- Following up the progress of action plan initiated on the above-mentioned items
- Controlling intake to prevent excess stock
- Review with feeder shops and other departments on material control
- Analyzing operation of bins and acting for closing bins

III. Production control

- Monitoring work-in-progress and planning to control WIP by interacting with shops
- Working with shops to reduce manufacturing lead time.
- Preparing reports to aid management decision making
- Monitoring capacity control
- Analyzing order input to shops to identify excess/overload
- Preparing and following-up shop order status report
- Co-ordinating with shops and process Planning & time standard departments to update
 - production processing documents
- Following-up shortage items
- Taking corrective action to minimize shortage items

IV. Customer service

- Revising warehouse consumption levels based upon revised budget/forecast/requirement/Product plan to serve customers better.
- Reviewing sales planning parameters and revising based upon consumption trend, stock position, product, and sales constraints.
- Review customer order requirement position and re-planning to protract/bring forward due date and revise the order quantity.

V. Warehouse / Stores management

- Planning and organizing storage area for products and re-usable raw materials /cut pieces/semi-finished products
- Monitoring storage methods to preserve the materials
- Ensuring/checking proper issue of goods like FIFO, etc.
- Monitoring other warehouse procedures like ledger maintenance, house – keeping, display, weighing/ measuring etc.
- Checking and monitoring material handling system in warehouse
- Monitoring physical stock verification - annual and perpetual/continuous

VI. Scrap management

- Planning to optimize full sheet (steel) utilization to minimize scrap/off cuts generation
- Interacting with shops and process planning department for minimizing scrap
- Interacting with scrap disposal in charge for disposing obsolete items/scrap
- Planning and coordinating with various divisions/department like purchase, manufacturing shops, process planning, etc., to make effective use of sheet steel off-cuts
- Planning for scrap storage, handling, and maintenance

VII. Computerizing

- Updating and maintaining procedures systems and documents required for computerizing
- Collecting data and building information systems viz, where used list, material list etc
- Identifying probable areas for computerizing
- Working to computerize the identified areas
- Interacting with EDP on various transactions and terminal related problems
- Analyzing “Normal outputs” from EDP
- Identifying “Exception outputs” Required from EDP and designing format

VIII. Personnel management

- Allotting/assigning work to MPC and warehouse employees
- Reviewing and monitoring the jobs performed by MPC and warehouse employees
- Training employees, making them participate in discussions /functions, motivating employees to do improvement and perform the jobs more efficiently etc.
- Managing employees/handling grievances/solving their problems

IX. Self-improvement

- Listing out action plan for the day
- Planning and working to make improvement, innovation etc.
- Attending seminars in – house and outside
- Reviewing /following –up the progress in action plan for the day
- Interacting with ‘Peer group’ to share information on matters related to day-to-day work
- Consulting manuals, past records, journals, magazines, publications etc. on matters related to daily work

(B) Time calculations

Time for the job elements was calculated, based on prior experience, through the steps A & B given below:

- A. Ranking & allocated time for main jobs

B. Ranking & allocation time for small job elements

In the Step A, each main job was rated (out of 10 points) based on four of attributes viz., Priority, Importance, Nature, and Frequency / duration, as shown in table 1.

Table 1: Ranking & Allocating points for the main jobs

Main jobs	Priority	Importance	Nature	Frequency/ Duration	Total	Rank
I. Material Planning	8	6	6	4	24	4
II. Material Control	7	8	5	8	28	2
III. Production Control	6	7	8	5	26	3
IV. Customer service	5	4	4	6	20	5
V. Warehouse Management	3	1	1	7	12	7
VI. Scrap Management	1	2	7	2	12	7
VII. Computerizing	9	9	9	9	36	1
VIII. Personnel Management	4	4	2	3	13	6
IX. Self-improvement	2	3	3	1	9	9

These attributes were chosen based on the opinion of experts in the organization and based on certain theoretical inputs on job analysis. Considering the total points and rank, allocation of time for each main job was done as shown in table 2.

Table 2: Time for the main jobs (summary)

Main job	Time spent (hrs.)
I. Material Planning	5.75
II. Material Control	6.75
III. Product Control	6.25
IV. Customer service	4.75
V. Warehouse Management	3.00
VI. Scrap Management	2.50
VII. Computerizing	10.00
VIII. Personnel Management	3.75
IX. Self-improvement	2.25
Total	45.00

Suitable approximation and rounding-off procedures were done keeping in mind the picture of the job content. In the Step B, the different job elements under each main job were taken up. Each job element was also rated (out of 10 points) based on four of attributes namely, Priority, Importance, Nature, and Frequency / duration as depicted in table 3.

Table 3: Ranking & Allocating points for the small job elements (for the main job I)

Job Code	Priority	Importance	Nature	Frequency/ Duration	Total	Rank
101	1	5	4	1	11	10
102	2	3	7	3	15	7
103	7	9	10	2	28	5
104	6	10	9	10	35	1
105	3	4	3	6	16	6
107	8	8	8	5	29	4
108	10	6	5	9	30	2
109	5	1	2	4	12	9
110	4	2	1	7	14	8

Due to space constraints and to avoid monotony, only sample calculations (only for the main job I) are shown here. Time for each job element was allocated based upon approximation and rounding-off procedures, considering the total points obtained by each job element (table 4).

Table 4: Time for the job elements for the main job I (summary)

Job Code	Time spent (hrs.)
101	0.25
102	0.25
103	0.50
104	1.25
105	0.25
107	1.00
108	0.50
109	0.25
110	0.50
Total	5.75

The outcome indicated the time content for each of the broken-down element of the job under the different main jobs. The tabulated time details are given in table 5.

Table 5: Job codes for all the job elements & time spent on the job

Job code	Hours spent on job	Job code	Hours spent on job
101	0.25	131	1.25
102	0.25	132	0.75
103	0.50	133	0.25
104	1.25	134	0.50
105	0.25	135	0.25
106	1.00	136	0.50
107	0.50	137	0.75
108	1.00	138	0.75
109	0.25	139	1.00
110	0.50	140	0.25
111	0.50	141	0.25
112	1.00	142	0.25
113	0.50	143	1.25
114	1.25	144	2.00
115	1.50	145	0.75
116	0.50	146	3.00
117	0.75	147	1.00
118	0.50	149	1.25
119	0.25	150	1.00
120	1.25	141	0.25
121	0.40	151	1.75
122	0.45	152	0.75
123	0.75	153	0.25
124	0.75	154	0.40
125	0.50	155	0.75
126	0.40	156	0.25
127	1.25	157	0.25
128	0.50	158	0.25
129	1.75	159	0.35
130	1.75	Total (101 to 159)	45.00 hrs.

Discussion

The analysis done in this paper using work break-down structure and ranking cum point-allocation for a sample job depicts a systematic method of arriving at the time taken for completing the respective job elements in the sample job considered for the study. This meets the requirement of the managing director of the organization who wished to have strategic plan to improve profit levels of the company. That the head of human resources of the organization chose to review the job performance of the employees, for meeting the needs of the managing director, is similar to Mittal, Dhiman & Lamba (2019) who, in a recent study, highlighted the role of superiors in the job performance of the employees.

In the analysis, the time content for some job elements that are even slightly away from the main job-focus of the job chosen in the analysis has turned out to be little higher. A similar importance had been put forth by Rodriguez et al. (2020) who found that specialized knowledge, giving advice & providing consultation, friendliness, assertiveness, and reliability are the important factors that will help the employee to perform better in their job. These are typical job-related characteristics that are crucial in any job and will facilitate good performance of an employee in the main job. Therefore, these characteristics had gained importance in the authors' study.

While trying to correlate the analysis and outcome illustrated in the present paper with the previous studies, it was observed that there had also been a different view. Chakraborty & Biswas (2019) opined that job analysis and job design would not have strategic impact on a company's growth. Instead, the authors mentioned that manpower planning would help in achieving the goal better. However, in a most recent research, Nita (2022) identified the relationship between job analysis, HR planning, employee performance, and compensation management, which strengthens the systematic approach and the method used in the current paper to analysis adopted in the current paper.

The results of the analysis depicted in the current paper can be seen also in a mixed way. In another recent work, Cangialosi, Battistelli & Odoardi (2021) brought out the findings that indicated four compatible configurations of job characteristics leading to a high level of innovative work behavior, though two other characteristics were found to be leading to low level. Job elements that arouse interest to the employee have been ranked and rated high in the current paper. This output is on the lines of the findings of a very recent study conducted in a different context by Gu et al. (2022) who concluded that interesting job has more job satisfaction in an individualistic country than in a collectivist country.

The points of certain job elements, related to job knowledge acquisition activity, being higher than the others in the outcome of the current paper is like the result arrived at by Heidary, Ghazel & Zolghadr (2018) who asserted that productivity of a knowledge worker is high when they deliver the expected quantity of job output more.

Conclusion

Job analysis, an excellent tool that helps to add value to the organizations and human resources, is usually given inadequate emphasis in terms of systematic approach in most organizations. But the benefits of job analysis can be enormous, if systematically carried out with at least minimal quantitative analysis. But, in the fast-moving pace of organizations, such a methodical analysis at times, becomes difficult to plan and implement. The paper has taken up the case of an organization that aims to improve the profit level from the declining trend and discusses how a systematic approach can help in better utilization of manpower by transfer, job redesign, etc. rewarding those whose work content are comparatively high, providing additional support to those whose work overflow, and so on. The analysis done in this paper can serve as a sample to those organizations that require some inputs in this context.

Conflict of Interests

The authors declare that they have no conflict of interests.

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