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JOB ANALYSIS

Job analysis is a label given to the process of obtaining information about jobs, which includes both the description of what is done at work and the specification of what capabilities are needed to perform the work. It is one of the most widely used organizational data collection techniques and forms the foundation on which virtually all other human resource management systems are built. Finally, its use is essential to meet legal requirements. Despite changes in the work environment, job analysis remains an essential tool for industrial and organizational psychologists.

As a process, job analysis involves a series of choices, including the type of information to collect, the method by which the data will be collected, and the source of the data. The specific choices made, however, will depend on the purpose of the job analysis (or the reason it is being conducted). Job analyses can be conducted for a number of purposes, including the following:

- Developing job descriptions that describe the essential nature of the job
- Classifying jobs into clusters or families of related jobs

- Developing selection systems, in which the job analysis is used to describe the knowledge, skills, abilities, and other characteristics needed for successful task performance
- Developing performance appraisal systems, in which the job analysis is used to identify the key tasks and work behaviors performed on the job
- Evaluating the worth of different jobs for compensation purposes
- Designing or redesigning jobs to make them more interesting or efficient to perform
- Developing training programs, in which the job analysis is used to identify the key tasks that workers must be able to perform

TYPE OF INFORMATION TO COLLECT

The type of information to collect is dictated by the purpose of the job analysis. Thus, it is essential to articulate the purpose clearly prior to starting a job analysis. With the purpose clearly defined, a variety of information can be gathered about a job. One of the most common types of information collected in a job analysis concerns work activities. *Work activities* are the observable behaviors performed by workers. There are several ways to examine work activities, varying on a continuum from very detailed actions to global behaviors. These include elements, tasks, duties, and generalized work activities. An *element* can be thought of as the smallest unit into which it is practical to divide any work activity without analyzing separate movements, motions, and mental processes. Tightening a bolt on a water pump would be an example of an element of an auto mechanic's job. There are often hundreds of elements for a job, which often makes them impractical units for most purposes. A *task* is a collection of related elements performed closely in time. Tasks have an identifiable beginning and end and are directed toward the achievement of specific job objectives. Replacing the water pump to ensure adequate engine cooling would be an example of a task from an auto mechanic's job. Most jobs can be summarized with between 30 and 100 tasks, which makes the task level very useful for numerous purposes. For example, when designing a training program, it is often helpful to have a very detailed understanding of the tasks performed on the job. This informs the content of the training program in terms of specific tasks workers need to learn.

A *duty* is a collection of related tasks that have a common focus or purpose. Rebuilding automobile engines would be an example of a duty for an auto mechanic's job. Most jobs can be summarized in terms of 6 to 12 duties. The duty level is also very useful. For example, when designing a performance appraisal system, the duties of a job can be used as the key performance dimensions on which workers are rated or judged. Finally, a *generalized work activity* is a collection of similar job activities that underlie the accomplishment of major work functions. It is similar to elements, tasks, and duties in that it focuses on what is accomplished at work, but it differs in that it focuses on higher-order behaviors. Some examples highlight the differences. Handling and moving objects, resolving conflicts and negotiating with others, and implementing ideas, programs, systems, or products are all examples of generalized work activities. Because these are more general behaviors, generalized work activities can be used across different jobs, whereas elements, tasks, and duties are typically job specific.

Another common type of information collected in job analysis is *worker requirements*, which are the underlying characteristics workers need to perform the tasks of a job. There are numerous types of worker requirements, but common requirements include knowledge, skills, abilities, and personality characteristics. *Knowledge* is defined as conceptual, factual, and procedural information that is related to task performance. Knowledge is often very specific to a job and can be divided into *declarative* knowledge (knowledge of what) and *procedural* knowledge (knowledge of how). For example, an accountant needs to have knowledge of relevant laws (declarative) as well as knowledge of how to file a tax return (procedural). *Skill* is defined as the proficiency or competency to perform a task or closely related set of tasks. Skills can be divided into *basic* skills, which facilitate learning or the acquisition of new knowledge (e.g., reading skills), and *cross-functional* skills, which are developed capabilities that facilitate job performance across job contexts (e.g., problem-solving skills). *Ability* is defined as a relatively enduring capacity for performing a range of tasks. Abilities and skills are similar, but the main distinction is that abilities are thought to be relatively enduring, whereas skills are thought to improve with experience and training. Higher-order abilities include cognitive (e.g., verbal and quantitative), psychomotor

(e.g., dexterity, reaction time), and physical (e.g., strength, hearing). *Personality characteristics* are those distinctive traits unique to an individual. It is thought that certain traits will lead to success on the job. Examples of common personality characteristics sought in workers are dependability, honesty, stress tolerance, and adaptability.

Although work activities and worker requirements are the two most commonly collected types of information in a job analysis, several other types of information can be gathered, as well. These include such things as the work context, or the broader environment within which the job is performed. For example, the work environment might be subject to extremes of temperature, noise, or danger. Another important type of information concerns licensure or certification requirements. Some jobs may require licenses or other certification prior to working on a job. For example, both lawyers (bar exam) and accountants (CPA exam) have to pass exams to work in their field. Another important type of information concerns the equipment, tools, or machines that are used on the job. Because some jobs rely heavily on certain types of equipment, tools, or machines, it would be impossible to understand them without considering these elements. Finally, critical incidents are often collected via job analysis. *Critical incidents* are short examples of highly effective or ineffective work behavior. They typically include a description of the situation, what the worker did, and the outcome of the worker's actions. Critical incidents are often helpful in developing anchored rating scales that can be used in the development of selection or performance appraisal tools.

JOB ANALYSIS METHODS

Once it is decided what type of information to collect, it is necessary to choose the method(s) through which to collect the data. Each method offers a slightly different perspective on the job and has different strengths and weaknesses. It is good practice to use multiple methods to collect job analysis data. There are four main methods through which job analysis data can be collected. First, the job analyst can observe the workers as they do the job. Direct observation involves recording what is done on the job, how it is done, and why the various parts of the job are performed. An advantage of direct observation is that it is

not subject to reporting biases on the part of the worker. Unfortunately, it may not be possible to observe key aspects of the job, particularly if the job involves a great deal of mental activity. For example, if one were to observe a patent examiner (who decides whether to issue a patent for a new product) as she judges the prior art (similar past products), there would be few outward manifestations of this cognitive processing.

The second method, however, overcomes this limitation of direct observation. Individual interviews involve recording workers' descriptions of what they do on the job. This format is flexible because it allows the job analyst to collect virtually any type of information. Through this method it is possible to acquire very detailed information about the job. If additional details are needed, the worker can be prompted for more information. If the worker makes statements that are questionable (e.g., an entry-level worker indicating he has very high-level responsibilities), the job analyst can directly question the validity of the statement. Drawbacks to this method are that workers may not be able to describe all that they do and it can be very time-consuming to conduct individual interviews.

The third method addresses the inherent inefficiency of individual interviews by gathering a number of workers or other subject matter experts and conducting a group interview. In addition to being more efficient, group interviews enable the job analyst to gather consensus about key job aspects. Yet there are potential problems with conformity and social loafing in group settings. Ways to overcome these problems are to structure the group interaction such that all members must contribute to the group and disagreements are actively solicited. The fourth method involves the use of surveys to collect detailed information about the job. Surveys enable the efficient collection of a wide range of types of information. For example, it is possible to collect work activity or worker requirement information on the extent to which a capability is needed at entry to the job (as well as other aspects of the capability, including level, frequency, importance, criticality, and relative time spent using). In addition, surveys enable the job analyst to quantify the work activities and worker requirements and use this information to make decisions about the job. Potential drawbacks include careless responding and nonresponses to lengthy surveys.

SOURCE OF JOB ANALYSIS INFORMATION

There are numerous sources of job analysis information, including the worker, a supervisor of the worker, a job analyst (i.e., a person trained in job analysis techniques), and archival job information (including past job analyses and databases such as the Occupational Information Network). Sources are the places where the information is collected. As with the method, each source provides a slightly different perspective on the job and has different strengths and weaknesses. When conducting a job analysis, it is important to collect information from a variety of sources to balance their strengths and weaknesses, resulting in a more accurate picture of the job. Some of the strengths and weakness of the sources are as follows. The worker (or job incumbent) typically has very high familiarity with the job (assuming adequate experience on the job) and thus should have high levels of job knowledge. Unfortunately, job incumbents are not always able to fully describe their job or otherwise articulate what it is they do in terms that are useful for job analysis purposes. In addition, workers are sometimes not motivated to provide accurate and reliable information.

Supervisors, on the other hand, are often in an excellent position to understand what worker requirements are needed for success on the job. In addition, they are less likely to be motivated to bias job analysis results. Yet supervisors may lack detailed information about the job, particularly if they have never performed it. Job analysts typically generate highly reliable ratings, have little motivation to bias the results, and are able to integrate large amounts of information and make fine distinctions among different jobs. Yet job analysts may lack adequate information about a job, particularly if there are numerous infrequently occurring tasks. In addition, because job analysts typically have prior knowledge of the job they are investigating (perhaps from a previous job analysis), they may harbor stereotypes about the job that bias their judgment. Archival job information from a source such as the Occupational Information Network is useful because it is provided at no cost to the user and it contains a great deal of comparative information on a wide range of jobs. Yet the jobs contained in archival databases may not match the jobs in the organization. In addition, the data may not be current and the specific detail

needed may be absent, requiring original data collection.

—Frederick P. Morgeson

See also Job Analysis Methods; Job Description

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JOB ANALYSIS METHODS

A variety of job analysis methods have been developed over the years. These include work-oriented methods, which seek to describe what a worker does, worker-oriented methods, which seek to identify the characteristics needed to successfully perform job tasks, and hybrid methods, which combine elements of work- and worker-oriented methods. Because of space constraints, only methods that are widely used or prototypic are discussed here. The Further Reading section identifies other methods for the interested reader.

WORK-ORIENTED METHODS

Several work-oriented methods have been developed, including task analysis, functional job analysis, and the critical incident technique. Task analysis is perhaps the most commonly used work-oriented method for describing what a worker does.

Task Analysis

Task analysis involves a comprehensive listing of all the tasks performed in a job, such that a *task*

is defined as a collection of related elements performed closely in time. Tasks have an identifiable beginning and end and are directed toward the achievement of specific job objectives. Once all the tasks are identified, they are typically placed into a job analysis survey and rated by workers and supervisors in a variety of ways, including how frequently the task is performed, how important the task is to the job, and whether it is important to be able to perform the task as soon as one starts on the job. Because the tasks performed are typically unique to a given job, separate task analyses need to be conducted for each job.

There are at least four steps associated with conducting a task analysis. The first step involves developing a comprehensive listing of tasks. Typically, workers and their supervisors are asked to help generate lists of all the tasks that are performed on the job. This can be done through individual brainstorming, group meetings, or individual interviews. In addition, job analysts often observe the job and consult any existing documentation (e.g., training manuals, checklists, performance appraisal forms) for additional insight into the tasks. Effective task statements typically begin with an action verb that describes what the worker does, how he or she does it, and to whom or what (object) and why a worker does it.

The second step involves taking the listing of tasks and developing a job analysis survey. Similar tasks are typically grouped by duty on the survey. One key issue in this step concerns what kinds of response scales to use. It is possible to collect multiple kinds of information about the tasks. For example, it may be important to know if a worker performs the task as part of his or her job. Other potentially important information may involve how much time a worker spends on each task, how difficult the task is to perform, how frequently the task is performed, how critical or important the task is to job success, the consequences of performing the task incorrectly, and whether one needs to be able to perform the task when one starts the job (or whether it can be learned on the job). The choice of response scale(s) should be dictated by the purpose of the job analysis and the conclusions one hopes to reach. It is important to realize, however, that there is often considerable overlap between different response scales and that it is fairly easy to overload respondents with multiple, similar response scales.

The third step involves administering a job analysis survey to collect quantitative data. Choices that arise during administration include whether to use a paper-and-pencil or Web-based (or computerized)

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