

needed may be absent, requiring original data collection.

—Frederick P. Morgeson

*See also* Job Analysis Methods; Job Description

#### FURTHER READING

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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)

survey and who should complete it. The choice of paper-and-pencil versus Web-based survey should be driven largely by the capability of the survey designers and the familiarity of the potential respondents with the different methods. The choice of who should complete the survey is slightly more complex. It is important to make sure that whoever completes the survey has adequate knowledge of the job in question. As such, individuals who have been working on the job for a short period of time are often excluded (or at least their data is not used when conducting analyses). It is often a good idea to collect data from both workers and supervisors because of their different perspectives on the job. It is often best to sample widely to collect as representative a sample as possible. Regardless of who completes the job analysis survey, demographic information should be collected (e.g., age, work experience, gender, education, ethnicity) so that the sample can be described and the data can be analyzed for potential differences among demographic groups.

The fourth step involves summarizing the data and developing a report. There are many ways in which task data can be summarized. Means and standard deviations are typically reported for each task. It is sometimes helpful to also report means and standard deviations for all the tasks that a particular duty comprises. In addition, it can be useful for those who are less familiar with statistics to report the percentage of respondents responding in each response category or the percentage of respondents responding above a particular predefined level (e.g., percentage of respondents who indicate a task is "important" or "very important"). In addition, depending on the application, it might be useful to report data divided by demographic group, location, or other meaningful grouping.

## WORKER-ORIENTED METHODS

Several worker-oriented methods have been developed, including the Position Analysis Questionnaire (PAQ), the job element method, and the ability requirements scales. The PAQ has been the most researched and implemented worker-oriented method.

### Position Analysis Questionnaire

The PAQ is a worker-oriented method that focuses on the worker behaviors that are involved in work activities. The PAQ can be used across any type of job (in contrast to task surveys). One advantage of the

PAQ is that it can be used to examine the similarities and differences among multiple jobs.

The PAQ contains 187 items assessing worker activities and work context variables (it also includes 7 items assessing pay). It has six major divisions, which include information input (where and how a worker gets needed information), mental processes (what decision-making, reasoning, and other cognitive activities are involved on the job), work output (the physical activities and tools/equipment used), relationships with other persons (the nature of interpersonal relationships required in the job), job context (the physical and social context of the job), and other job characteristics (anything else not covered in the major divisions). Within each of these major dimensions are more specific work activities, work conditions, or job characteristics.

The PAQ uses six response scales to gather data on the different items (only one scale applies to a particular item). The response scales (with their scale anchors) are as follows: (a) extent of use (nominal/very infrequent to very substantial); (b) importance to job (very minor to extreme); (c) amount of time (less than a tenth of time to almost continually); (d) possibility of occurrence (very limited to high); (e) applicability (does not apply or does apply); and (f) special scales, which are specific to a particular item.

The PAQ is best used by trained analysts because of the relatively high reading level and complexity of some aspects of the questionnaire. Typically, use of the PAQ begins with an analyst observing several workers as they perform the tasks of the job. Then the job analyst interviews workers and completes the PAQ. The analyst uses the information gathered in the interview and observed on the job to decide how to rate the job on the PAQ items. The complete forms are then scored by computer, and summary results are provided.

A large amount of research has been conducted on the PAQ since its introduction in the 1960s. Despite some criticisms, this research has generally shown the PAQ to produce reliable and valid ratings on jobs. Convergence across job analysts has been good, and the PAQ dimension scores have been shown to be related to compensation and worker ability levels.

## HYBRID METHODS

Hybrid methods use elements of both work- and worker-oriented job analyses. Examples include the Occupational Information Network, the combined job

analysis method, and the Multimethod Job Design Questionnaire. The Occupational Information Network (or O\*NET) is the U.S. Department of Labor's replacement for the Dictionary of Occupational Titles (DOT). As such, in many respects it represents the future of job analysis.

### Occupational Information Network (O\*NET)

As a result of changes in the nature of the workplace, the U.S. Department of Labor decided to replace the task-based DOT with a more modern and flexible job analysis system. The O\*NET was designed with several features in mind: (a) the inclusion of multiple descriptors or content domains to capture the range of ways in which work can be described, (b) the development of cross-job descriptors to enable comparisons between different jobs, and (c) the use of a taxonomic approach to occupational classification to enable exhaustive coverage within a content domain. Using these principles, a content model was developed that identified six content domains and specific categories within each domain.

The first domain includes those *worker characteristics* that are thought to be enduring individual attributes that influence the capacities workers can develop, as well as the willingness of workers to engage in certain kinds of activities. This domain includes abilities, occupational values and interests, and work styles (or personality characteristics). The second domain includes *worker requirements*, which are general attributes that are developed through education and experience and thus are more amenable to change than worker characteristics. This domain includes knowledge, skills, and education. The third domain includes the *occupational requirements* that represent descriptors of the work itself instead of descriptors of the worker. This domain includes generalized work activities, work context, and organizational context.

The fourth domain includes those *experience requirements* that reflect the types and quantities of experience required in specific occupations, including worker experience in other jobs, job-related training, on-the-job training, and licensure or certification requirements. The fifth domain includes individual *occupation characteristics*, which reflects three aspects of the labor market: labor demand, labor supply, and other labor market information. The sixth domain includes *occupation-specific requirements*, and it

focuses on information that is unique to a particular job, including occupation-specific skills and knowledge, tasks and duties, and machines, tools, and equipment. Because this information is unique to a particular job, this domain differs from the other five domains.

The O\*NET uses different response scales, depending on the domain. For example, for abilities, data is collected on the level and importance of a particular ability to the job. For work context, on the other hand, the frequency with which a particular contextual feature is present is measured. Research has shown relatively strong relationships between different response scales for the same descriptor, suggesting redundancy in the scales. In contrast to the analyst-derived ratings of the Dictionary of Occupational Titles (DOT), O\*NET relies on the judgments of the workers themselves. Because the O\*NET is new, there is less information on the reliability and validity of the various domain descriptors, although initial results suggest the ratings are reliable.

The O\*NET differs from previous job analysis methods in several ways. First, it focuses on occupations as opposed to jobs. In some instances occupations are the same as jobs, and in other instances multiple jobs would be combined under a single occupational title. For example, the DOT summarized information on more than 12,000 jobs; the O\*NET includes roughly 1,000 occupations. Although some of the 12,000 job titles in the DOT are either redundant or obsolete, it is not clear that the dramatic reduction in occupational titles will meet all the needs of potential users of O\*NET. Second, it combines a wider range of data that resides at many levels of analysis. For example, O\*NET collects information on the economic, organizational, job, and individual levels. One of the challenges of this wide array of data, however, is that it is not clear that all of these levels make sense at the occupational level. Third, the O\*NET is an Internet-based system that is accessible by any potential user. In fact, there is a Web site (<http://www.onetcenter.org/>) where one can access the O\*NET surveys or database. It is even possible to download the latest version of the database and perform additional analyses. Thus, O\*NET represents an excellent starting point when conducting a job analysis study.

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See also Job Analysis; Job Description; Occupational Information Network (O\*NET)

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## JOB CHARACTERISTICS THEORY

The primary objectives of job characteristics theory (JCT) are to explain how properties of the organizational tasks people perform affect their work attitudes and behavior, and to identify the conditions under which these effects are likely to be strongest. The most recent version of the theory is shown in Figure 1. As shown in the figure, the theory posits that five core characteristics of the work itself affect a variety of personal and work outcomes via their effects on three psychological states of employees. In addition, the theory argues that these core characteristics have their strongest effects when employees score high on three

individual conditions: growth need strength, context satisfaction, and knowledge and skill.

The conceptual core of the theory is the set of three psychological states that mediate between job attributes and outcomes. They are as follows:

- *Experienced meaningfulness*. The degree to which the jobholder experiences the work as inherently meaningful, as something that counts in his or her own system of values.
- *Experienced responsibility*. The degree to which the jobholder feels personally accountable and responsible for the results of the work he or she does.
- *Knowledge of results*. The degree to which the jobholder has confident knowledge about how well he or she is performing.

Job characteristics theory posits that the simultaneous presence of these three psychological states results in a number of favorable personal and work outcomes. Specifically, the jobholder should (a) be internally motivated at work (i.e., feel good when performing well, and feel bad or unhappy when performing poorly), (b) be satisfied both with the opportunities for personal growth and development at work and with the job in general, and (c) perform effectively at work (i.e., produce work that is high in both quantity and quality). However, if one or more of the psychological states is absent or at very low level, fewer of these desirable outcomes should emerge.

The three psychological states are internal to individuals and therefore do not represent properties of the work itself that might be changed or redesigned. Job characteristics theory identifies five characteristics of jobs that, when present at high levels, increase the chances that a jobholder will experience the three psychological states and, through them, shape the personal and work outcomes. The specific job characteristics that are expected to most strongly influence each of the psychological states are (a) skill variety, (b) task identity, (c) task significance, (d) autonomy, and (e) feedback. These characteristics are described in the following paragraphs.

*Experienced meaningfulness* is shaped by three job characteristics: skill variety, task identity, and task significance. *Skill variety* is the degree to which carrying out the work of the job requires a number of activities, which involve the use of a number of skills and talents of the jobholder. Work that stretches one's skills and abilities invariably is experienced as more meaningful than work that is simple and routine. *Task Identity* is the

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