

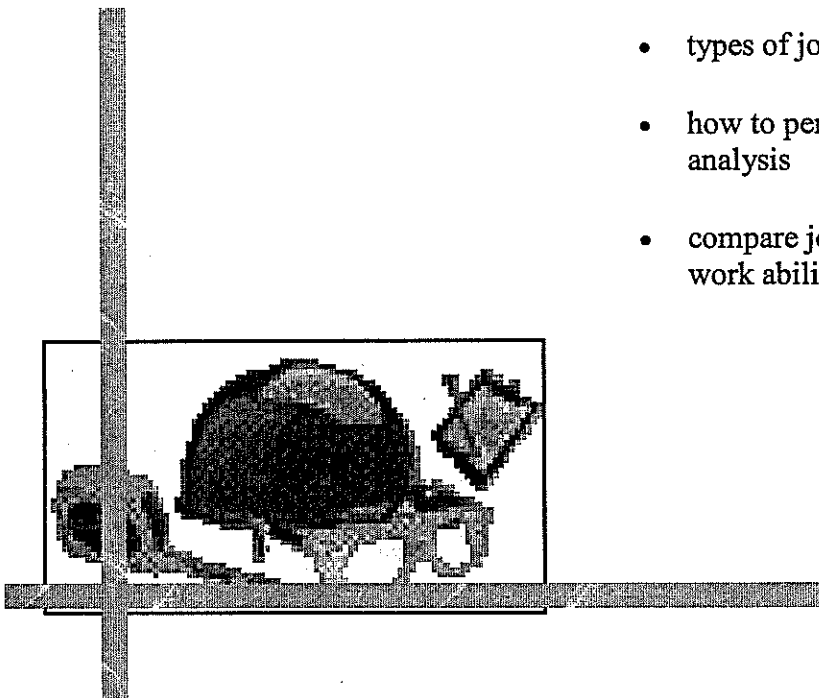
job analysis



- I. Job Analysis Defined
- II. Job Analysis Requirements
- III. Types of Job Analyses
- IV. Job Analysis Components

WHAT YOU NEED TO KNOW

- types of job analysis
- how to perform a job analysis
- compare job analysis to work abilities



I. JOB ANALYSIS DEFINED

JOB ANALYSIS

Job information is the basic data used by industry, governmental and private agencies and employee organizations for occupational programs. The nature of the required job information varies in type and approach according to program needs. Regardless of the ultimate use for which it is intended, the data must be accurate; conclusive; omitting nothing pertinent to the program and presented in a form suitable for study and use. The technique for obtaining and presenting this information is known as "JOB ANALYSIS".

ACCEPTED TECHNIQUE

An employer cannot judge how effectively a test will select good employees without first determining what a good employee is in the context of a particular job. This in turn demands a knowledge of the operations, tasks, and responsibilities of the job in question. A job analysis is the accepted technique used to obtain this information.

Armed with a properly prepared job analysis, an employer can demonstrate an employee's job-readiness with validity. (Under the Uniform Guidelines, job analysis is cited as one of the two ways that may be used to validate an employment test, statistical studies being the other). An inaccurate job analysis (i.e., one that omits significant job essential functions, mistakes job requirements, or is otherwise deficient) will make it difficult, if not impossible, for an employer to determine how well a test relates to actual job requirements. This, in turn, may create serious legal problems.

Job Analysis identifies and describes in a systematic and comprehensive but succinct manner:

- What the worker does in terms of activities or functions.
- How the work is done.
- Results of the work.
- Worker characteristics, the skills, knowledge, abilities, and adaptabilities needed to accomplish tasks involved.
- Context of the work in terms of environmental and organizational factors, and the nature of the worker's discretion, responsibility, or accountability.

job analysis

JOB DESCRIPTION

Basic to the job analysis is the job description, which is a listing that briefly describes the job tasks, duties or responsibilities. Task description should be clear and concise and provide meaningful and accurate information. A Job Description must be preceded by an analysis.

WORK

Effort directed toward the production or accomplishment of something; labor. Work is the culmination of a broad range of operations performed by an individual to produce goods and/or services. The individual is the basic indivisible physical unit of an organization which performs quantifiable functional tasks of the organization.

The six segments of work are: occupations, jobs, position, duties, tasks, and elements.

OCCUPATION

Occupation is a grouping of jobs which are similar in terms of the experience, training and types of skills, knowledge or abilities required of workers. A job is defined with a particular level or grade but occupation involves an entire area of work without regard to level.

JOB

A job is a group of positions which are identical or at least very similar in their significant duties. While a distinction is made between job and position, in practice the terms are often used interchangeably.

POSITION

A position consists of one or more duties requiring the services or activities of one worker. Positions may vary in scope and purpose. There are as many as there are workers.

- It has a definite scope and purpose,
- It requires the full time services of one individual,
- It involves work which usually utilizes related skills, knowledge, and abilities,
- It exists whether occupied or vacant.

DUTY

A duty includes a large segment of the work performed by an individual and may include any number of tasks. A duty is a distinct and major activity involved in the work performed or required of a position.

The distinguishing characteristics of a duty are:

- It is usually recognized as one of the principal responsibilities,
- It occupies a reasonable portion of the work time,
- It occurs with reasonable frequency in the work cycle,
- It involves work operations which utilize related skills, knowledge, and abilities,
- It is performed for some purpose, by some method, according to some standard with respect to speed, accuracy, quality, or quantity.

TASK/FUNCTION

A task or function is the next term in a hierarchy of terms used to define work. It is a distinct identifiable work activity that constitutes one of the logical and necessary steps in the performance of the duties of a position. A task is a logical and necessary step required in the performance of a duty.

The distinguishing characteristics of a task are:

- It occupies a reasonable portion of the worktime spent in performing the duty.
- It involves activities with closely related skills, knowledge, and abilities.
- It is performed according to some standard.

ELEMENT

An element is the smallest unit into which work can be divided without analyzing separate motions, movements, and mental processes involved.

When performing a job analysis in the industrial setting, most frequently a specific position which is distinguishable from other positions of the same job classification or occupation is analyzed.

II. JOB ANALYSIS REQUIREMENTS

MINIMUM REQUIREMENTS

A 1982 study of two dozen court decisions concluded that job analysis had to meet the following requirements, *at a minimum*, to win acceptance by the courts:

- The job must be objectively observed and measured with clear purpose.
- The job analysis must be in writing and must apply to the actual job at issue in the case.
- Information about the job should be obtained from several different sources.
- The job analysis should specify the KSAO's required for the job (knowledge, skills, abilities, and other factors).

PROTOCOL FOR DISABILITY EVALUATION

The object of testing-oriented job analysis is to derive a weighted list of KSAO's required to perform a given job. This information is used to make such decisions as:

- Which commercial or standardized test to use,
- How to weight elements of tests constructed in-house,
- What to put into the performance rating scale or scales (the criterion),
- Whether to use performance, written, or interview tests.

ESSENTIAL JOB FUNCTIONS

The analysis should include a list of job functions, which are defined as behaviors focused on things, people, or data that seek to fulfill some specified group of objectives set by the employer. The list should be representative of all functions performed by all employees in the job group. The guidelines do not require a description of all functions, but require that the job analysis describe "all important work behaviors and their relative importance and level of difficulty."

KSAO'S REQUIRED

A selection test may be based directly on samples of work activities or functions or on the KSAO's that the job analysis shows to be necessary for success in the job. A list of KSAO's would not be essential to support a work sample test that mimicked job duties, but would be necessary to support a test of strength or intelligence. The job analysis should identify the KSAO's each function requires.

WEIGHTING

The job analysis should indicate what percent of time is spent on each function. It should also indicate how important KSAO's are, based on such factors as: time spent on functions requiring each KSAO, how essential the KSAO is for minimum performance, how well it distinguishes superior employees from others, and other factors.

Job analysts collect information from:

- Direct observation of people currently doing the job (incumbents).
- Individual or group interviews.
- A conference with experienced personnel/supervisors.
- Questionnaires.
- Diaries of activities.
- Personnel and equipment records.
- Records of critical incidents.
- Work manuals.
- Any other method appropriate to the circumstances, including having the job analyst perform some of the functions him/herself.

EQUIPMENT LIST

- Chatillon Medical Dynamometer Csd 300c Digital Memory
- Sharp Viewcam VI-E36 Ldc & Tripod (Need Slow/Pause)
- Dictaphone
- Industrial Scale 300lbs
- Stopwatch
- Inclinometer
- Calculator
- Clipboard
- Temperature & Humidity Sensor
- Safety Glasses
- Hard Hat
- Steel Toed Shoes
- Hearing Protection
- Plumbob & String
- Tape Measure
- Carrying Case Piggyback Rolling

III. TYPES OF JOB ANALYSES

SPECIFICITY

A job analysis is performed for specific purposes, including classification and compensation, developing tests, protection from EEO claims, and developing return-to-work and pre-placement programs. Information derived for any one of these purposes can contribute to the others. For example, job analysis for training and for testing both focus directly on determining the specific abilities needed in the job. However, job analyses done for different purposes are not interchangeable. Because of this, a test validity report should specify that the underlying job analysis was done for testing purposes.

ESSENTIAL FUNCTION ANALYSIS (EFA)

The main purpose of performing this analysis is to provide a factual basis to support decisions regarding the functional capacity of someone to perform the essential job duties. The outcome of the analysis should provide the medical personnel with an adequate understanding of the position requirements so that he/she could make an informed and valid evaluation between the potential employer's medical condition and the position performance requirements, therefore minimizing applicants being unfairly excluded from positions that they could safely perform. This analysis includes two divisions:

1. Differentiating between skills and ability
2. Defining the physical abilities of the job

Ability is defined as a general trait which is fairly enduring and difficult to change in the adult. Abilities are inherited as well as learned. A skill represents a level of proficiency in a specific position. It is assumed that skills are involved in complex activities and that these activities can be described in terms of other more basic abilities. Distinguishing between skills and abilities allows greater precision in describing, understanding, and evaluating a function.

Physical abilities are used to evaluate jobs in terms of performance levels, and each physical ability is defined and differentiated from the other physical abilities by use of a rating scale representing different amounts of the ability required.

ERGONOMIC HAZARD ANALYSIS (EHA)

This method involves analyzing jobs as a result of an increase in incidents of injury to a particular body area or areas. Typically the medical or safety department enlists a professional to aid in ascertaining cause and formulating an intervention plan complete with ergonomic recommendations. The first step in this type of in depth job analysis study is for the professional to become familiar with the technologies of a specific job and characteristics of the industry to be studied. Information for these purposes may be obtained from:

- Books, periodicals, and other literature on technical or related subjects available in contemporary literature searches.
- Internal studies completed such as time studies, job safety studies, or medical surveillance records.
- Computer assisted ergonomic models may be necessary to test and prove hypotheses before actual implementation would occur.

By doing advanced research, the analyst will be able to talk intelligently to management, supervisors, and workers in a language common to all. Many times the background information will yield answers to concerns while allowing the evaluation of the job tasks in process to occur objectively without loss of time.

REHABILITATION JOB ANALYSIS (RJA)

The primary purpose of performing job analyses as part of a vocational/medical rehabilitation program is to identify the functional, environmental, and task requirements of specific positions to compare with a disabled person's functional abilities to facilitate reentry into the labor force. The job analysis is essential for determination of vocational feasibility, employability, vocational handicap, and potential earning capacity of individuals who have incurred disability resulting in temporary or permanent loss of work capacity.

HUMAN RESOURCE JOB ANALYSIS (HRJA)

The nature of the occupational information varies in type and in approach according to the specific needs of the job analysis. However, regardless of the specific use of the job analysis the data collected must be accurate, inclusive, and presented in a form suitable for study and use by the intended program. The job analysis is the basic tool for identifying, documenting, and supplying occupational information needed by a particular program.

The Human Resource based job analysis determines individual activities and job requirements, describes job performance, develops the qualifications and performance standards, assists to formulate training requirements and programs, and provides a stepping stone for career development definitions. The job analysis is also used by management to enhance the utilization of worker skills, to develop reasonable accommodation opportunities, and to develop work site safety programs.

FUNCTIONAL JOB ANALYSIS: UNITED STATES EMPLOYMENT SERVICE

The United States Employment Service (USES) has done pioneering work in the field of job analysis. The *Handbook for Analyzing Jobs* sets out a functional job analysis approach, which emphasizes how worker behavior relates to data, people, and things, and to the objectives of the organization.

The USES format for writing task statements is widely followed. Statements using this format typically begin with explicit, active verbs, without naming the actor. It is understood that it is the incumbent employee who "Cuts patterns..." or "Negotiates with union representatives". The statements cover what is done, what tools are used, how much freedom the worker has to act, what the objective is, and whether the task is performed infrequently.

The *Handbook* provides information on estimating the aptitude requirements of jobs. These aptitudes are "the specific capacities or abilities required of an individual in order to facilitate the learning of some task or job duty. The USES has identified 11 aptitudes and determined the aptitude requirements for some 500 jobs. To determine aptitude requirements for jobs not on this list of 500, the Service recommends comparing the duties involved in such jobs - derived from job analysis data - with duties involved in the jobs the Service has already examined. The U.S. Department of Labor *Dictionary of Occupational Titles* has estimates of the aptitude, physical demands and environmental conditions of over 12,000 occupational titles.

CRITICAL INCIDENTS TECHNIQUE

The Critical Incident Technique of job analysis emphasizes job behaviors that distinguish satisfactory workers from unsatisfactory workers. It is based on the theory that certain tasks and incidents are crucial to effective job performance, while others are not. Critical tasks and behaviors elicit the display of abilities or worker characteristics that differentiate between success and failure on the job, while other tasks are performed pretty much the same by all workers. The technique has been widely used for performance evaluation and is only recently becoming an important approach for determining job requirements.

The Critical Incidents Technique typically relies on information obtained from people who are very familiar with the job, such as supervisors and, in some cases, workers. The first step is for the job experts who will participate in drawing up the list of critical incidents to agree on the objectives and goals of the job. The next step is to develop a list of critical incidents. If time is short, the list may be developed by interviewing people who are knowledgeable about the job and asking them to recall incidents that occurred in the past. If time permits, a more complete list of behaviors can be obtained by collecting incidents as they occur.

Each critical incident should indicate what problem presented itself to the employee, how the employee responded, how effective the response was, and what its consequences were.

Critical incidents may be used to identify a list of KSAO's that separate good workers from bad, or to formulate a work sample test or critical incident interview in which candidates are asked how they would respond to a given set of circumstances.

JOB ELEMENT APPROACH

The job element approach originated in the federal government. It is used primarily for blue collar workers in the skilled trades and industrial occupations, but also, to a lesser degree, for white collar jobs.

Job elements are abilities, skills, knowledge, and personal characteristics that enable candidates to meet critical work requirements. They are related to such KSAO's as manual dexterity, ability to visualize objects in space, and computational accuracy.

JOB ELEMENT APPROACH

Job incumbents and supervisors supply the list of job elements during a brainstorming session. They follow-up by assigning a weight to each element, based on four criteria: the proportion of barely acceptable workers who have the job element; the effectiveness of the element in picking a superior worker; the trouble likely to occur if the element is not considered; and practicality, meaning the effect that insisting on the job element will have on the organization's ability to fill job openings.

Once identified, the constructs can be built into tests, with weights appropriate to their job significance. The process of deriving job elements is rooted in the judgments of a large number of incumbents and supervisors and thus entails great reliability and implicit validity. Testing programs can be further refined using knowledge gained from criterion related studies. This approach incorporates aspects of both construct and synthetic validity operations. The job elements approach has been expanded to create a kind of taxonomy of job elements extending across many jobs and occupations that allows employers to determine whether a test designed and validated for one job in one location will be relevant to another job in another location.

POSITION ANALYSIS QUESTIONNAIRE

The Position Analysis Questionnaire (PAQ), developed by Purdue Research Foundation, provides a list of 194 job elements (descriptors, not to be confused with the job elements described in the previous section) that characterize jobs in terms of securing information, processing information, outputting behavior, interpersonal activities, work environment (physical working conditions and psychological and social factors), and other characteristics. Questionnaires are completed using rating scales that characterize each element according to its importance to the job, extent of use, duration, possibility of occurrence, applicability, and other special factors. Studies have shown that different raters give essentially identical ratings to job tasks when using the PAQ scales.

Once questionnaires have been completed for a group of jobs, they can be sent to PAQ Services, located in Logan, Utah, for analysis. The employer receives percentile scores on 32 PAQ dimensions that describe the mental and physical abilities the job requires. Predictions of mean test scores on the General Aptitude Test Battery (GTAB) subtests and estimated validities of GATB subtests for each job are also provided by PAQ Services.

REASONABLE ACCOMMODATION ANALYSIS

The job analysis is critical in the development of reasonable accommodations for the disabled population into the normal labor market. The five areas most commonly identified as methods of reasonable accommodations are:

- work restrictions
- job restructuring
- job/site modifications
- support services
- barrier removal

The work restriction is a physical or environmental limitation of the worker from performing specific physical functions in specific environmental conditions. The work restriction is the most inexpensive method with the broadest scope of application for reasonable accommodation. Work restrictions should be determined and recommended by a physician who has reviewed the physical requirements and working conditions of the position. The physician should examine the nature and severity of the medical condition and its importance to the physical abilities required in the job performance.

Work restrictions should be written in a clear and specific language. Frequently the terms "light duty" or "sedentary work" are vague and subject to differing interpretations. For the work restrictions to be meaningful and effective they should convey the same message to management and the worker.

Job restructuring differs from work restrictions in that nonessential duties of a particular position should not - be restructured so as not to comply with the job classification for which it was originally defined. Job restructuring should be performed following the completion of a job analysis identifying the specific physical tasks required of a position. In analyzing the position to determine the suitability for job restructuring the analyst needs to be observant for those physical activities which are carried out by an incumbent but may be altered such as object height, individual work habits, or for mere worker convenience. To determine the essential from non-essential tasks the question to be asked would be, "if the principal flow of work would stop through the elimination of the task in question." For an employee to be qualified for reasonable accommodation under general Federal and state guidelines, they need to be able to perform the "essential functions of the position". The job analyst could discuss examples of job restructuring with management to determine attitudes and interest in job restructuring to accommodate disabled workers.

REASONABLE ACCOMMODATION ANALYSIS

Job/site modifications differ from job restructuring and work restrictions in that these accommodations involve changing the methods and means of task accomplishment. Modifications require creativity, imagination and flexibility on the part of the analyst and management. Job/site modifications generally impose some financial costs on the employer. However, the costs are generally quite small. Many times the disabled person is the best source of what modifications may be helpful in them returning to the performance of their work. In modifying a job/site the issues of job performance and eliminating aggravation to the existing medical condition are paramount considerations for developing the recommendations for purchasing of adaptive equipment or making job site alterations. A functional capacity evaluation and/or work hardening program may be necessary to quantify the physical abilities of an individual to compare to the job performance requirements. The analyst's familiarity with special adaptive tools and equipment is helpful in recommending and implementing job/site modifications.

Supportive services and barrier removal are the last two common types of accommodations used to assist disabled workers in returning to the normal labor market. Supportive services generally are the most difficult to convince an employer to provide or accept as terms of employment. Generally these accommodations are utilized in large organizations, major corporation, state and federal agencies. It is most important that the support and person hired not perform any of the actual or essential duties of the position which the disabled person is hired. The support person is to only facilitate job performance, not actually complete tasks. Barrier removal is primarily concerned with architectural barriers or those that inhibit facilities to be used by handicapped persons. Institutional barriers are those that the institution may use such as employment testing, hiring policies, selection criterion that screens out the handicapped or disabled individual from consideration for employment. An example of an institutional barrier removal would be changing the testing procedures to allow the handicapped person to take the test with necessary accommodations (i.e. sign language, reader, an accessible test site).

Reasonable accommodation enhances the goals of human resource professionals for the attraction and development of the talents and capabilities of available qualified human resources.

OTHER APPLICATIONS OF JOB ANALYSIS INFORMATION

Another major use of job analysis information is to provide a database for job evaluation programs. Job evaluation is the application of individual jobs in an establishment. There are several job evaluation methods in use, all of which require that jobs first be carefully analyzed and job descriptions prepared, including detailed information on worker characteristics. The job analyses enable the evaluators (usually a committee) to obtain a thorough knowledge of each job, from the standpoint of the factors upon which the value of the job is based.

Job analysis information has many other uses in the public and private sectors, such as in occupational health and safety programs, labor cost management, industrial engineering and worker performance appraisal.

IV. JOB ANALYSIS COMPONENTS

COMPONENTS

All job analysis methods require that certain categories of information about jobs be collected, analyzed and recorded in a systematic way. There are two major types of job information: the work performed and the worker characteristics. The specific categories of information under each are the *Job Analysis Components*. Each job analysis component has a specific number of factors, which are defined as subcomponents. One or more factors assigned to a given job or work activity is an estimated rating made by the analyst, based on an application of the definitions of the factors to the activities and requirements of the job.

WORK PERFORMED

Work performed includes those job analysis components that relate to the actual work activities of a job. The work performed components are:

- Worker Functions,
- Work Classifications,
- Work Devices.

Worker Functions are the ways in which a job requires the worker to function in relation to data, people, and things, as expressed by mental, interpersonal and physical worker actions. For purposes of job analysis, a total of 24 worker functions have been identified and organized as follows:

Data	People	Things
0 Synthesizing	0 Mentoring	0 Setting up
1 Coordinating	1 Negotiating	1 Precision Work
2 Analyzing	2 Instructing	2 Operating Controlling
3 Computing	3 Supervising	3 Drawing - Operating
4 Comparing	4 Directing	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking - Signaling	6 Feeding - Discharging
	7 Serving	7 Handling
	8 Taking Instructions Helping	

WORK PERFORMED

Work Classifications are groupings of technologies and socioeconomic objectives that reflect how work gets done and what gets done as the result of the work activities of a job, or, in other words, the purpose of the job. They may be based on specific technologies, such as Electroplating and Abrading; on overall social objectives, such as Animal Propagating and Plant Cultivating; or on combinations of specific related technologies, such as Machining and Structural Fabricating -Installing - Repairing.

Materials, Products, Subject Matter, and Services:

- Basic materials being processed, such as fabric, metal, and wood.
- Final products being made, cultivated, harvested, or captured, such as wild animals, sponges, field crops, trees, and automobiles.
- Data, when being dealt with or applied, such as in economics and physics.
- Services being rendered, such as barbering and dentistry.

Work Devices are the machines, equipment, tools and work aids used by the worker to carry out the specific activities of the job. Machines and Equipment are devices which are combinations of mechanical parts with the framework and fastenings to support and connect them, designed to apply a force to work on or move materials, process data, generate power, communicate signals, or have an effect upon material through the application of pressure. They may be actuated by hand or foot power applied through levers or treadles, or by any outside power source, such as electricity, steam or compressed air. Examples are printing presses, drill presses, casting machines, forging machines, conveyers, hoists, locomotives, automobiles, adding machines, typewriters, ovens, stills, forges, cameras, generators, switchboards, radio transmitters, and signal-light systems.

Tools are hand-held implements which are used to move materials. Included are all common and special-purpose hand-tools, and those used by the worker and actuated by outside power sources, such as electricity or compressed air. Examples of the latter are pneumatic hammers, cutting torches, paint spray guns, electric screwdrivers, and electric instruments.

WORK CHARACTERISTICS

Worker characteristics include those job analysis components which reflect worker attributes that contribute to successful job performance, with regard to the work activities themselves and the environment in which they are performed.

The worker characteristics components are:

- General Educational Development (GED)
- Cognitive/Psychological
- Physiological

Temperaments are the adaptability requirements made on the worker by specific types of jobs.

- D - DIRECTING activities
- R - Performing REPETITIVE tasks
- I - INFLUENCING people
- V - Performing a VARIETY of tasks
- E - EXPRESSING personal feelings
- A - Working ALONE
- S - Working under STRESS
- T - Attaining TOLERANCES
- U - Working UNDER specific instructions
- P - Dealing with PEOPLE
- J - Making JUDGEMENTS and decisions

WORK CHARACTERISTICS

Physical Demands are the physical capacities of the worker to perform assigned tasks. The physical demand factors are:

1. Standing	16. Reaching
2. Walking	17. Handling
3. Sitting	18. Fingering
4. Reclining	19. Feeling
5. Lifting	20. Talking
6. Lowering	21. Hearing
7. Carrying	22. Tasting/Smelling
8. Pushing	23. Near Vision
9. Pulling	24. Midrange Vision
10. Climbing	25. Far Vision
11. Balancing	26. Depth Perception
12. Stooping	27. Visual Accommodation
13. Kneeling	28. Color Vision

In addition to the above factors, there are six degrees of strenuousness which are defined in terms of some of the strength-related factors. The one whose definitions most closely matches the physical requirements of a job is the overall physical demands rating for that job. The degree of strenuousness are:

S - Sedentary Work MH - Medium Heavy Work
L - Light Work H - Heavy Work
M - Medium Work VH - Very Heavy Work

Environmental Conditions are the specific physical working conditions to which the worker is exposed while performing assigned tasks. Environmental Conditions are:

- | | |
|---------------------------|--------------------------------|
| 1. Exposure to Weather | 8. Moving, Mechanical Parts |
| 2. Extreme Cold | 9. Electric Shock |
| 3. Extreme Heat | 10. High, Exposed Places |
| 4. Wet and/or Humid | 11. Radiant Energy |
| 5. Noise | 12. Explosives |
| 6. Vibration | 13. Toxic or Caustic Chemicals |
| 7. Atmospheric Conditions | 14. Other |

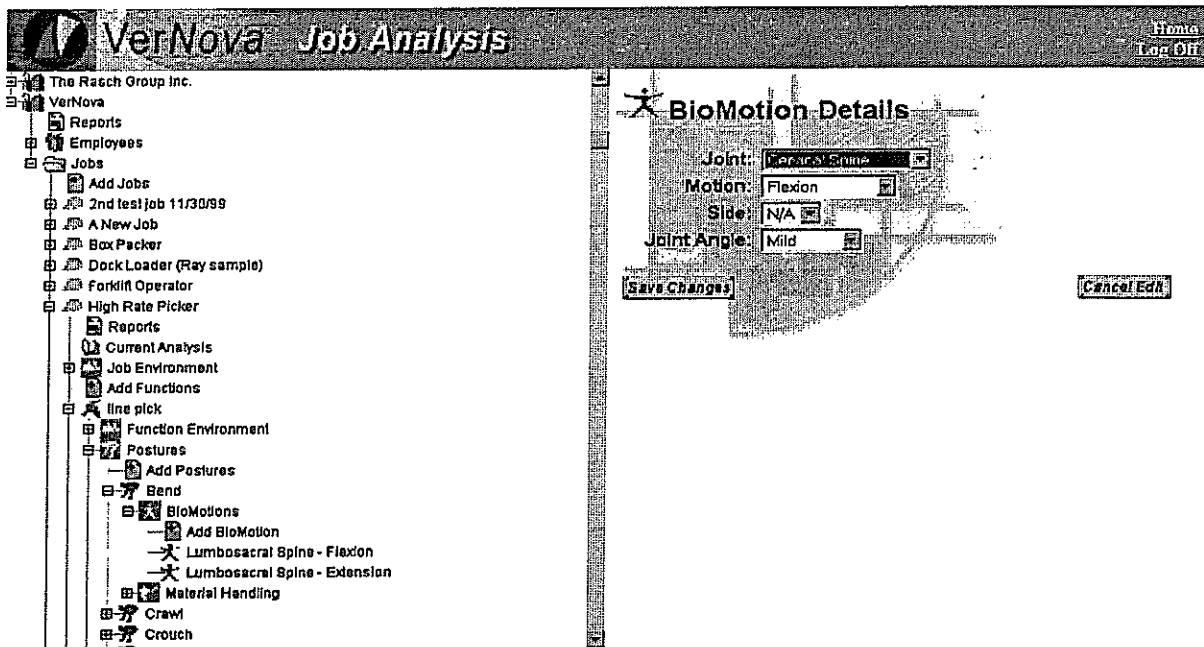
SUMMARY

The learning objective of this section was to:

- ✓ Introduce the purpose and reason for job analysis
- ✓ Acquaint the evaluator with job analysis methodologies
- ✓ Outline the components of job analysis

LEARNING EXERCISE:

Job Analysis software will be presented.



job analysis

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