

The analysis and design of work



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The first section of this chapter discusses the analysis of work process within a given work unit. Having provided an understanding of the broader context of jobs, the chapter discusses the need for and usefulness of both job analysis and the techniques for performing job analysis. Finally, the chapter concludes by presenting the various approaches to job design to provide managers with an understanding of the costs and benefits of emphasizing different characteristics of jobs when designing or redesigning them.

Learning Objectives

After studying this chapter, the student should be able to:

Analyze a work-flow process, identifying the output, activities, and inputs in the production of a product or service.

Understand the importance of job analysis in strategic and human resource management.

Choose the right job-analysis technique for a variety of human resource activities.

Identify the tasks performed and the skills required in a given job.

Understand the different approaches to job design.

Comprehend the trade-offs among the various approaches to designing jobs.

Extended Chapter Outline

Note: Key terms appear in boldface and are listed in the “ Chapter Vocabulary” section.

Opening Vignette: Teams & Levi's: A Poor Fit?

Like many corporations attempted in the 1990's, Levi's tried to mimic the success of Chrysler's team-based organizational structure. Unfortunately, the team-based structure did not materialize at Levi's. Efficiency of pants produced dropped 30% as a result of the team structure, as well as labor and overhead increasing by 25%. Overall, the cost of production increased from \$5 a pair of pants to \$7.50.

Introduction-Designing the work to be performed is one of the first tasks of strategy implementation discussed in Chapter 2. The way a firm competes can have a profound impact on the way tasks are organized, and the way the tasks are designed may provide the company with a competitive advantage. Also, the way jobs are designed can, in fact, affect company work-unit performance. There is no "one best way" to design jobs and structure organizations. The organization needs to create a fit between its environment, its competitive strategy and philosophy on the one hand, with its job and organizational design on the other. Job analysis and job design are interrelated.

Work-Flow Analysis and Organizational Structure (Work-flow analysis, analyzing work outputs, processes, and inputs; see text Figure 4.1 and TM 4.1)

Work-flow Analysis

The Work-flow process is useful because it provides a means for the managers to understand all the tasks required to produce a high-quality product as well as the skills necessary to perform those tasks.

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Analyzing Work Outputs

Work outputs are products of, or services provided by, a work unit.

Example: A work output for GM is a new Buick off the assembly line; a work output for Gordon Landscaping Company is a mowed lawn.

Once outputs have been identified, it is necessary to specify the standards for the quantity or quality of these outputs.

ProMES (productivity measurement and evaluation system) is a productivity improvement technique that focuses attention on both identifying work-unit outputs and specifying levels of required performance for different levels of efficiency.

Analyzing Work Processes

Work processes are the activities that members of a work unit engage in to produce a given output.

Example: Work processes needed to produce an automobile include assembly, painting, and so forth. Every process consists of operating procedures that specify how things should be done to develop the product or service.

Analyzing Work Inputs

Work inputs are the “ ingredients” that go into the work processes and can be broken down into three categories (text Figure 4. 1).

Raw materials consist of the materials, data, and information that will be converted into the work unit's products.

Equipment refers to the technology, machinery, facilities, and systems necessary to transform the raw materials into the product or service.

Example: Raw materials for the assembly of automobiles include various parts (steering wheels, tires, door panels, etc.) and equipment used, including robotic welding machines.

Human skills refer to the worker's knowledge, skills, abilities, and efforts necessary to perform the tasks.

Organizational structure provides a cross-sectional overview of the static relationship between individuals and units that create the outputs.

Two of the most important dimensions of structure are centralization and departmentation.

Centralization is the degree to which authority resides at the top of the organizational chart.

Departmentation refers to the degree to which work units are grouped based upon functional similarity of work flow.

Two types of Structural Configuration of organizational structure tend to emerge in organizations.

A functional structure (See Fig. 4. 2 and TM 4. 2 in text) employs a functional departmentation scheme with high levels of centralization. Functional

structures are very efficient. However, they tend to be inflexible and insensitive to subtle differences across products, regions, or clients

A divisional structure (see Figures 4. 3, 4. 4, 4. 5 in the text and TM 4. 3, 4. 4, 4. 5) employs a workflow departmentation and low levels of centralization. Because of their work-flow focus, their semi-autonomous nature, and their proximity to a homogenous consumer base, divisional structures tend to be more flexible and innovative. However, they are not very efficient.

Structure and the Nature of Jobs

Jobs in functional structure need to be narrow, highly specialized, and people need to work alone.

Jobs in divisional structures need to be more holistic, team-based structure with greater decision making authority.

Job analysis is the process of getting detailed information about jobs.

The Importance of Job Analysis to HR Managers

Job analysis has been called the building block of everything that the personnel department does.

Some of the human resource activities that use job's analysis information include selection, performance appraisal, training and development, job evaluation, career planning, work redesign, and human resource planning.

The Importance of Job Analysis to Line Managers

Managers must have detailed information about all the jobs in their work group to understand the work-flow process.

Managers need to understand the job requirements to make intelligent hiring decisions.

Since the manager is responsible for ensuring that each individual is performing his or her job satisfactorily, the manager must clearly understand the tasks required in every job.

Job Analysis Information

A job description is a list of the tasks, duties, and responsibilities (TDRs) that the job entails. (text Table 4. 1)

A related readings from Dushkin's

Annual Editions: Human Resources 99/00:

“ HR's role will change. The question is how. HR 2008”

by Floyd Kemske

A job specification is a list of the knowledge, skills, abilities, and other characteristics (KSAOs) that an individual must have to perform the job.

Example: Job specifications for an employment assistant would include: (1) a four-year college degree with major course work in human resources or an equivalent combination of experience, education, and training; (2) considerable knowledge of principles of employee selection and assignment of personnel; (3) the ability to express ideas clearly in written and oral

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communication; (4) the ability to independently plan and organize one's own activities.

Competing by Meeting Stakeholders' Needs:

Staying Alive at the Graveyard

Human beings are not nocturnal animals, therefore, working at night is not a natural activity for most people. Evidence suggests that people working the “graveyard shift” are more likely to develop problems like fatigue, depression, obesity, and also have been found to be more accident-prone and have higher absenteeism and turnover. Fortunately, research shows that people with certain characteristics, like being “night owls” and who exercise regularly, can respond easier to this type of disruptive behavior.

Sources of Job Analysis Information

In general, it will be useful for the manager to go to the job incumbents to get the most accurate information about what is actually done on the job. However, the incumbents might exaggerate their job duties.

Managers should ask others familiar with the job, such as the supervisor, to look over any information received from the incumbents.

Research has shown greater agreement between supervisors and subordinates when rating general job duties than when rating specific tasks. Also, incumbents may be the best source for accurate estimates of time spent on job tasks, but supervisors may be more accurate on the importance of job duties.

Research is somewhat inconclusive about the relationship between the performance level of the job analyst and the job-analysis information he or she provides, but recent research has shown that effective and ineffective managers tend to give the same job-analysis ratings despite their performance level.

Because of inconclusive research results on the influence of demographic and experience differences, it is best to take steps to ensure that the incumbent group responsible for job-analysis information represents a variety of gender, racial, and experience level categories.

Competing Through High Performance Work Systems: Telework

With the new millennium approaching, the trend of separating work life from home life may be a thing of the past. With the costs of office space combined with the drastically reduced prices of portable electronic computing and communication devices, a new trend may develop called telework (doing one's work away from a centrally located office). Telework programs can save up to \$8000 per employee annually. The number of teleworkers is on the rise. Telework programs have advantages such as a productivity gain caused in part by flexibility that allowed people to work at their peak efficiency and partly by eliminating distractions. Telework programs also have some disadvantages such as employees feeling a hindrance of teamwork and some felt it was harder to balance home and work.

Job Analysis Methods

Position Analysis Questionnaire (PAQ)

The PAQ is a standardized job analysis questionnaire containing 194 items representing work behaviors, work conditions, or job characteristics that are generalizable across a wide variety of jobs.

The 194 items are organized into six sections, and the job analyst is asked to rate each item on six scales. A computer program generates a job report based on the ratings.

Research has indicated that the PAQ measures 13 overall dimensions (text Table 4. 2). Knowing the dimension scores provides some guidance regarding the types of abilities that are necessary to perform the job.

One of the main problems with the PAQ is that it requires the reading level of a college graduate to complete the questionnaire.

Task Analysis Inventory

The task analysis inventory method refers to several different methods that focus on analyzing all the tasks performed in the focal job. It is not uncommon to have over 100 tasks for a job.

The task inventory's CODAP method has SMEs generate a list of tasks and then the SMEs rate each task on various dimensions such as the time spent on the task, frequency of task performance, relative importance of task, and relative difficulty of the task.

The "task analysis" method is different from the CODAP method since once the task list is developed, the SMEs are asked to identify the skills, abilities, and personal characteristics required to perform each task

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Fleishman Job Analysis System (FJAS)

This approach defines abilities as enduring attributes of individuals that account for differences in performance. The system is based on a taxonomy of 52 cognitive, psychomotor, physical, and sensory abilities that adequately represent all the dimensions relevant to work (see Table 4. 3 in the text).

The FJAS scales include behavioral benchmark examples of the different levels of the ability along a sevenâ€™ point scale. SMEs indicate the point on the scale that best represents the level of that ability required in a certain job (Figure 4. 6 and TM 4. 3).

Dynamic Elements of Job Analysis

Although we tend to view jobs as static and stable, in fact, jobs tend to change and evolve over time. The job analysis process must also detect changes in the nature of jobs.

Competing Through Globalization Box: Eliminating Sweatshops at Nike

At the time when the Nike spokesperson, Michael Jordan, was bringing in over \$10 billion, the workers of Indonesian plants were far from ideal. Labor practices like severe punishment for missed goals and mandatory overtime helped keep costs low and quality high. Consumers became increasingly aware of how their sneakers were actually being made, which led to boycotts and human rights groups getting involved. To end this problem, CEO Phillip Knight raised minimum worker age requirements, adopted safety and Health Standards and allowed HRM to monitor worker conditions in all foreign

plants. Knight also invited competitors to do the same realizing that a failure to do so would result in a competitive disadvantage.

Job design is the process of defining the way work will be performed and the tasks that will be required in a given job. Job redesign refers to changing the tasks or the way work is performed in an existing job. Jobs can also be characterized on different dimensions of job design (Table 4. 4 in the text).

Motivational Approach

The motivational approach to job design focuses on the job characteristics that affect the psychological meaning and motivational potential and it views attitudinal variables as the most important outcomes of job design.

The prescriptions of the motivational approach focus on increasing job complexity through job enlargement, job enrichment, and the construction of jobs around sociotechnical systems.

An example of the motivational approach is Herzberg's Two-Factor theory.

A more complete model of how job design affects employee reactions is the Job Characteristics Model.

Jobs can be described in terms of five characteristics: skill variety, task identity, task significance, autonomy, and feedback.

These five job characteristics determine the motivating potential of a job by affecting three psychological states: experienced meaningfulness, responsibility, and knowledge of results.

When the core job characteristics are high, individuals will have a high level of internal work motivation, higher quantity and quality of work, and higher levels of job satisfaction.

The positive effects require that the employees have adequate levels of satisfaction with the work environment, have the necessary ability to perform the job, and that they have a need to grow.

There is some support for the idea that for those with high growth-need strength, job characteristics were more positively related to motivational outcomes than for those with low growth-need strength.

Much of the work on job enlargement, job enrichment, and self-managing work teams has its roots in the motivational approach to job design (Figure 4. 4 in the text). However, most of the research shows these interventions increase employee satisfaction and performance quality, but not necessarily increase quantity of performance.

Example: Duke Power Company redesigned its customer service function to be more decentralized and enriched the customer reps' job to allow for more decision-making authority. Whirlpool Corporation has also redesigned its customer service function by providing an 800 service line with customer reps that are often former service technicians and can help diagnose a problem over the phone.

A related reading from Dushkin's

Annual Editions: Human Resources 99/00:

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” Challenging Behaviorist Dogma: Myths About Money and Motivation

Mechanistic Approach

The mechanistic approach to job design has its roots in classical industrial engineering and focuses on designing jobs around the concepts of task specialization, skill simplification, and repetition.

Scientific management, one of the earliest mechanistic approaches, sought to identify the one best way to perform the job through the use of time-and-motion studies.

The scientific management approach was built upon in later years and resulted in a mechanistic approach that calls for the job to be designed very simply. The organization reduces its need for high-ability individuals, and workers are easily replaceable (a new employee can be trained to perform the job quickly and inexpensively).

A related reading from Dushkin’s

Annual Editions: Human Resources 99/00:

” HR Comes of Age” by Michael Losey

Biological Approach

The biological approach to job design comes primarily from the sciences of biomechanics (the study of body movements), and it is usually referred to as ergonomics (concerned with examining the interface between individuals’ physiological characteristics and the physical work environment). The goal of

this approach is to minimize the physical strain on the worker by structuring the physical work environment around the way the body works.

Example: At Toyota's high-tech Tahara No. 4 line, new electric vehicle carriers were installed to minimize stress on the workers' bodies. They adjust a car's height at every workstation. Toyota reports a major reduction in turnover during the plant's first year of operation.

The biological approach focuses on outcomes such as physical fatigue, aches and pains, and health complaints.

The biological approach has been applied in redesigning equipment to reduce the physical demands so women can perform the jobs and to reduce occupational illnesses such as carpal tunnel syndrome.

Perceptual/Motor Approach

The perceptual/motor approach to job design has its roots in the human factors literature and focuses on human mental capabilities and limitations. The goal is to design jobs in a way that ensures they do not exceed people's mental capabilities.

This approach generally tries to improve reliability, safety, and user reactions by designing jobs in a way that reduces the information processing requirements of the job.

This approach, similar to the mechanistic approach, generally has the effect of decreasing the job's cognitive demands.

Trade-offs among Different Approaches for Job Design (See Table 4. 5 in text and TM 4. 7)

One research study found job incumbents expressed higher satisfaction with jobs scoring highly on motivational approach. However, the motivational and mechanistic approaches were negatively related, suggesting that designing jobs to maximize efficiency is likely to result in a lower motivational component to those jobs.

Jobs redesigned to increase the motivating potential result in higher costs in terms of ability requirements, training, and compensation.

In designing jobs, it is important to understand the tradeoffs inherent in focusing on one particular approach to job design.

Chapter Vocabulary

These terms are defined in the “ Extended Chapter Outline” section.

Work’s Flow Analysis

Work Outputs

ProMES

Work Processes

Work Inputs

Organizational Structure

Centralization

Departmentation

Functional Structure

Divisional Structure

Job Analysis

Job Description

Job Specification

Job Element Method

Fleishman Job Analysis System (FJAS)

Task Analysis Inventory

Position Analysis Questionnaire (PAQ)

Job Design

Job Redesign

Motivational Approach to Job Design

Job Characteristics Model

Mechanistic Approach to Job Design

Biological Approach to Job Design

Ergonomics

Perceptual/Motor Approach to Job Design

Discussion Questions

Assume you are the manager of a fast-food restaurant. What are the outputs of your work unit? What are the activities required to produce those outputs? What are the inputs?

Some examples of outputs for a fast-food restaurant include the food orders and the service provided. Activities required to produce these outputs include cooking, cleaning, preparing orders, taking orders, and so forth. The inputs include the raw materials (the ingredients for the food orders), the equipment (stove, cash register), and the human resources (the ability to cook, the knowledge of what ingredients go into a menu item).

Based on question 1, consider the cashier's job. What are the outputs, activities, and inputs for that job?

Inputs for the cashier's job include the raw inputs (food ordered, prices, tax), equipment (cash register), and human resources (the skill to operate the register, the knowledge of the prices of the menu items, and the ability to answer customers' questions).

Consider the "job" of college student. Perform a job analysis on this job. What are the tasks required in the job? What are the knowledge, skills, and abilities necessary to perform those tasks? What environmental trends or shocks (e. g., computers) might change the job, and how would that change the skill requirements?

Tasks would include attending class, completing homework assignments, and participating in group assignments. Some examples of the knowledge, skills, and abilities needed are knowledge of prerequisite course material, college-level reading skills, and ability to work together with others. Some environmental trends that might change the job would result from changes in the job market, such as new knowledge that employers would expect college students to learn. An example might be knowledge of sexual harassment guidelines or ADA legislation.

Discuss how the following trends are changing the skill requirements for managerial jobs in the United States: (a) increasing use of computers, (b) increasing international competition, (c) increasing work-family conflicts.

Students should have no trouble discussing how these trends are changing the skill requirements for managerial jobs in the United States. Managers are increasingly expected to be computer literate. Managers are also expected to be knowledgeable about other cultures, and knowledge of a second language is more commonly preferred. Managers are also expected to be more sensitive to work/family conflicts (day-care and elder-care issues for example) and to be knowledgeable about various legislation that deals with such situations (such as the FMLA).

Why is it important for a manager to be able to conduct a job analysis? What are the negative outcomes that would result from not understanding the jobs of those reporting to the manager?

The chapter has a section on the importance of job analysis to both HR managers and line managers. The students' answers will probably reflect

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information in these sections as well as possible reasons of their own. The negative outcomes of a manager not understanding the jobs of his or her subordinates are that the manager may not make intelligent hiring decisions, may not be able to adequately evaluate the performance of subordinates, and will have trouble understanding the work's flow process if individual jobs are not understood.

What are the trade-offs between the different approaches to job design? Which approach do you think should be weighted most heavily when designing jobs?

As discussed in the chapter, the trade-offs appear to be between increased satisfaction and motivation and reduced efficiency due to increased costs. For example, the motivational approach that increases satisfaction results in lower utilization levels and increased training time. Table 6. 7 in the text summarizes the positive and negative outcomes of each approach. Students' answers will vary as to which approach they think should be weighted most heavily depending on their value of the various outcomes for each approach.

For the cashier in question 2, which approach to job design was most influential in designing that job?

In the context of the total work-flow process of the restaurant, how would you redesign the job to more heavily emphasize each of the other approaches. Students' answers will vary. All of the approaches could be used to design the cashier's job. To redesign the job to emphasize the mechanistic approach, students should discuss concepts such as more specialization. To redesign the job to emphasize the motivational approach, students should

discuss making the job more complex. To redesign the job to emphasize the biological approach, students should discuss adjusting or making changes in the equipment or job environment. To redesign the job to emphasize the perceptual/motor approach, students should discuss ways to make the job less demanding mentally.

Web Exercise

Students are asked to go to The Center for Office Technology's homepage and click on the "1998 Outstanding Office Ergonomics Program Winner" and review the steps organizations took to improve the office environment.

www.cot.org

End-of-Chapter Case

The New Factory Worker

Summary The trend toward high-skills manufacturing began in the mid-1980's with innovative companies such as Corning, Motorola, and Xerox. Companies are replacing assembly-line work with an industrial vision that requires skilled and nimble workers to think while they work. Today, life on the line requires more brains than muscle, so laborers are heading back to school.

Examine the changes that have been made in Fred Price's job at Northeast tool, and then compare these to the four types of job design approaches described earlier in this chapter. If we had before-and-after measures on each of the four approaches, which would have revealed the largest change in the content of the job and which would have revealed the least:

motivational, mechanistic, biological, or perceptual-motor? Knowing what

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you do about the trade-offs for various changes in job design, what negative outcomes might we fear from the types of changes brought about at Northeast?

With the advent of more technology at the Northeast Tool plant, Fred Price's job has changed from a hands on, production line type job, to a job that requires increased education, leadership skills and managing roles. The largest change in the content of the job: Mechanistic; least amount of change; motivational. The negative outcomes might be: increased training time, lower utilization levels, greater chance of mental overload and stress, and greater likely hood of error.

Technological changes, like the robotization of operations at Northeast Tool, can affect the structure of organizations, which in turn can change the level of skill requirements for workers. How did robotization affect the structure of Northeast Tool and the skill requirements for Fred Price's job? Can you think of other technological advancements that have resulted in the opposite affect on workers skill requirements? In what sense does the competitive strategy employed by the firm influence in which direction technology is likely to affect the skill level of workers?

When Northeast implemented technological changes at its plant, Fred Price's job skill requirements changed. Before Price was the one doing all the work at the plant. Now, Fred Price has to be technologically savvy enough to control the robots that took his job from him. Any new type of technology that is implemented at Northeast is going to change the skill requirements of individual's jobs. When Fred Price started working for Northeast, he was 18

years old. Northeast supplied only to local California customers. Now, Northeast has to become a company, and even international, to stay competitive. With this type of growth, a company has to change to stay competitive.

As we will see throughout this text, globalization has widespread effects on human resource practices. To what extent were the changes in jobs that came about at Northeast Tool driven by factors outside the U. S? If companies like Northeast Tool did not make these types of changes to compete, what other changes might they have had to make? If Fred Price was not willing to make the types of self-improvements he is making, what other types of changes would he have had to accept? What are the national implications of these kinds of changes, and how do these changes relate to the competitive advantage of nations like the U. S?

The factors, outside of the U. S, that affected the changes at Northeast were the technologically savvy plants in Japan and Germany. To stay competitive in the global market, and even domestically, Northeast had to implement new technology. If Northeast was not willing to make these changes, then business would be hurt because it just could not compete with the bigger, more technologically sophisticated plants. Fred Price, if not willing to change, would have to settle for something less. These types of changes are at the core of our national competitiveness, the U. S. has been at the forefront in this productivity and competitive war and should continue to do so.

Additional Activities

Teaching Suggestions

Several cases and articles can be used as additional activities when discussing the topic of job analysis and job design. The cases could be assigned to individuals as a writing assignment, possibly for extra credit, or could be assigned to groups to be done inside or outside of class. The articles could also be assigned and discussed in class. A possible library assignment is suggested to acquaint students with the Dictionary of Occupational Titles.

Harvard Business School Case 9â€™ 481â€™ 179, Office Technology, Inc. (A) by Beer, Von Werssowetz, and Witcraft, Teaching Note 5â€™ 485â€™ 021 by Beer and Spector.

Robert Dorr must consider changes in several order administration work organizations that are to be consolidated. The separate units handle product lines with very different characteristics and have managers with different operating styles, philosophies, and personalities. One group is set up in an assembly-line style. Another has a team concept of job organization. Office Technology, Inc. (B) provides future developments. Two videotapes (9â€™ 884â€™ 512) and (9884â€™ 513) are available for use with these cases.

Suggested questions for Office Technology, Inc.

Consider the order administration task. Discuss the process the LMP and OEM groups use to complete this task.

How would you reorganize work in OEM? Consider case facts and class readings and lectures in formulating your answer. Discuss the rationale for your recommendations.

If Dorr imposes an LMP-type team approach, what roadblock