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# PERSONNEL WORLD

## HOW DO YOU DESIGN A JOB?

**L**inda is a technical writer for a large company, writing reference and repair manuals on complex electronic equipment for computer maintenance personnel. At her annual performance review she received a marginal rating; satisfactory in most areas, but

improvement needed. Her manager said that, although her performance was generally adequate, her manuals contained too many technical errors and the job seemed to be more than she could handle. Furthermore, he said her attitude was poor, she complained too much and was absent more often than others.

Linda was upset and thought her supervisor was unfair. She had told him about long delays in getting technical experts to correct her drafts. Even though she didn't understand many of the technical details she was writing about, no one would help her.

Is the problem Linda or is it her job? Linda has to write reference manuals that identify and describe hundreds of electronic equipment parts. She is a writer, not an electronics expert, but good writing is what the job requires. That means she must rely on information provided by engineers and others. If the information is incorrect or she misunderstands what she is told, there is no way for her to tell if she is wrong. The work provides little feedback on the quality of her efforts. A secretary knows when she makes a typing mistake and can correct it. An auto mechanic finds out if the engine is fixed by starting it.

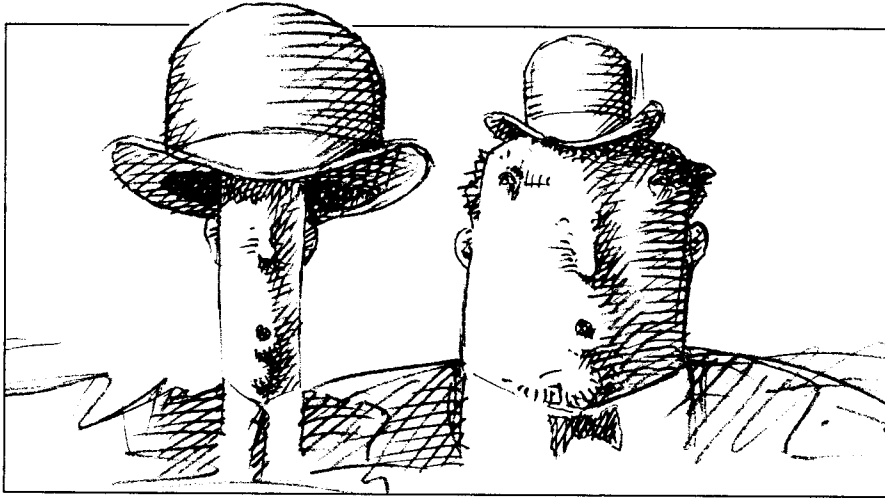


ILLUSTRATION BY SCOTT WRIGHT

But Linda, however, must endure the never-ending process of reviews and revisions by technical experts, making it difficult to get a feeling of accomplishment.

Linda is viewed within her organization as support personnel, not part of the development and manufacturing team. Consequently, her opportunities for communication and positive social interaction are limited. She sees no variety in the job; all projects look alike to her. All these factors reduce Linda's job satisfaction and motivation.

The problems with her job don't end there. The job places great demands on her ability to attend to and remember many details. Although all projects look alike, the job is not specialized enough so that the technical details are ever the same. Even worse, she must use a complex word-processing system, leading to errors and frustration. Finally, after finishing a draft of a manual, she has to wait for reviews, and waiting results in boredom. These delays have an impact on her performance, but when she mentions them to her boss, he says she complains too much.

The physical environment of Lin-

da's job is also poor. Her office lighting is bad and creates a constant glare on her computer screen. Her chair is uncomfortable and the keyboard too high. The office is noisy and either too hot or too cold.

Is this job made up? No, it's an actual job, although Linda is a composite of several people in that position.

### Blame the Job or Blame the Worker

It's common to blame the worker when the real problem is poor job design. Many people believe that a job's design is fixed, dictated by the technology or the work to be done. Unfortunately, if performance is judged as being poor, the boss looks first to the worker, not the job. However, most job designs are not fixed. They can be changed, often with predictable consequences. The question is, how?

To answer this question, an exhaustive search of available literature on jobs was conducted, and specific rules on job design were extracted. There were rules for equipment, facilities, environments, job content and methods. These rules were then analyzed and sorted into distinct groups, based on the similarity of underlying theoretical orientation.

Two major studies also were conducted. One studied 121 jobs in the forest products industry, and the other looked at 92 jobs in the electronics field. All levels and types of jobs were included. The jobs were analyzed, and

Figure 1.

**FOUR APPROACHES TO JOB DESIGN: A QUESTIONNAIRE****MOTIVATIONAL APPROACH**

- 1) *Autonomy*: Does the job allow freedom, independence or discretion in work scheduling, sequence, methods, procedures, quality control or other decisions?
- 2) *Feedback*: Do the work activities provide direct, clear information about the effectiveness (in terms of quality and quantity) of job performance?
- 3) *Achievement*: Does the job provide for feelings of achievement and task accomplishment?

**MECHANISTIC APPROACH**

- 1) *Job specification*: Is the job highly specialized in terms of purposes and/or activity?
- 2) *Skill simplification*: Does the job require relatively little skill and training time?
- 3) *Repetition*: Does the job require performing the same activity or activities repeatedly?

**HUMAN FACTORS APPROACH**

- 1) *Lighting*: Is the lighting in the workplace adequate and free from glare?
- 2) *Equipment usability*: Is the equipment needed on this job easy to learn and use?
- 3) *Attention requirements*: Is the amount of attention needed to perform this job minimal?

**BIOLOGICAL APPROACH**

- 1) *Strength*: Does the job require little muscular strength?
- 2) *Seating*: Are the seating arrangements of the job adequate (with ample opportunities to sit, comfortable chairs and good postural support)?
- 3) *Climate*: Is the climate at the workplace comfortable in terms of temperature and humidity, and is it free of excessive dust and fumes?

nearly 1,300 employees were interviewed or surveyed. Information on a broad spectrum of job areas was collected, including job satisfaction, absenteeism, training time, staffing difficulty, physical effort required, injury rates, error rates, job stress and mental demands. The research discovered four approaches to job design, each geared toward different sets of outcomes for individual employees and organizations.

*The motivational approach.* Advocates of the job-enrichment school of thought try to make a job motivational. Jobs should be designed to provide the worker with autonomy and the opportunity to make decisions about how or in what order tasks are done. The worker should get feedback on the quality of the work completed and be able to use a variety of skills and have opportunities for growth and learning. There also

needs to be a chance to participate in work-related decisions and get recognition for a job well done. The possible additional benefits of the motivational approach are improved performance and lower absenteeism.

How would this approach help Linda? Recommendations might include:

- A variety of assignments, to increase the opportunity to learn new skills
- Technical training so Linda would know enough about electronics to monitor the quality of her work
- Formal assignation to the development team to increase communication, social interaction and feelings of accomplishment.

*The mechanistic approach.* The efficiency experts of the mechanistic approach advocate scientific study,

perhaps with a stop watch and clipboard, to determine efficient work methods and techniques. This approach is based on the assumption that the work should be broken down into highly specialized jobs, tasks simplified, a minimum of idle time obtained and the use of repetition to benefit from practice.

The goals of this approach are increasing productivity, reducing errors and making a job as easy to perform as possible. The simpler the job, the less education and training are required and the easier it is to find people who can do it.

The mechanistic expert might recommend that:

- Technical writers be assigned to limited types of reports. This reduces the technical information to be learned by each employee, and provides for the efficiencies of repetition.
- A faster means of providing technical information and reviews should be developed to reduce idle time.

*The human factors approach.* This approach to job design has gained public attention through the Three Mile Island nuclear power plant incident. That catastrophe was initially blamed on operator error, another case of blaming the worker. Subsequent investigations placed part of the blame on the complexity of the control-room operator's job. Hundreds of gauges and controls and poorly developed procedures placed excessive demands on the operator in an emergency situation. Governmental regulations issued after the incident dictated that nuclear power plant administrators must consider the human factors in design.

This approach tries to ensure that the attention and concentration required by a job do not exceed the ability of the least capable worker. The job is designed to limit the amount of information about which the worker must pay attention to, think of or remember. In addition, perceptual demands of the work environment must be considered, such as appropriate lighting levels and user-friendly equipment. The goals of this approach are reducing mental stress and fatigue, training

requirements and chances for error.

The human factors approach recommendations for Linda's job might include:

- Reducing the amount of detail to remember. Some form of job aid, such as a glossary of technical terms or a revision of a part's technical name that would enhance a writer's ability to remember them.

- Make the word processor more user friendly, possibly through the improvement of instructional materials or simplifying programming systems.

- Improving the quality of lighting and reducing glare.

*The biological approach.* The goal of this approach is to reduce the physical demands of work and the resulting discomforts and injuries. Proponents are concerned with such overall physical requirements as strength and endurance needed to perform a job. Other concerns are with comfort features, including seating, climate, rest breaks and shifts. Biological recommendations for Linda's job might include:

- Modifying or replacing her chair so that she had adequate postural support

- Lowering the keyboard to reduce stress caused by bending her wrists

- Eliminating the source of the noise or installing sound absorbing materials in the work area

- Maintaining comfortable temperatures at all times.

#### **All Approaches Have Advantages and Drawbacks**

Although each of these approaches to job design can help make Linda's job better, all contain unintended consequences that advocates tend to ignore. Some of them are:

- Too liberal an application of the motivational approach can increase the mental demands of a job, therefore increasing training time and making it more difficult to find qualified employees. The stimulating nature of highly motivational jobs can lead to stress and burnout also.

- The mechanistic approach does a good job of cutting training time and ex-

pense, but it may lead to jobs that are less interesting, satisfying and rewarding.

- The human factors approach may unintentionally decrease mental demands to the point that boredom and monotony become major concerns.

- A drawback of the biological approach, and to some extent the human factors approach, is the financial cost of changing equipment or work environments.

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ing jobs, but it's done at considerable risk. Research shows that job design involves trade-offs between these approaches.

If the money is available to redesign the equipment and the environment, the physical aspects of a job can be improved. The major problems, however, concern the mental requirements job design imposes. Making a job more mentally demanding may make it more interesting, and the workers' goals for satisfying and motivating work are achieved. On the other hand, making a job less mentally demanding may increase the chances of reaching an organization's goals of reduced training cost, waste and error, and at the same time enlarging the labor pool from

which the organization can hire. Which trade-offs are made may depend on an organization's value orientation. What comes first — the employee or the organization?

There's no complete solution to this dilemma. Financial and mental demand trade-offs may have to be made. The adverse impact of any of these approaches can be minimized by avoiding extremes. The technology used in the research helps provide the means of doing so. Questionnaires were developed to measure the job design features of each approach (see Figure 1). They can be administered to either current employees or used in observing or discussing the job with employees. Jobs then can be scored on each approach. These surveys not only help identify jobs with problem designs but also offer recommendations on how the jobs can be improved.

The set of questions, combined with a broad perspective on job design, also can be used to assess jobs in the process of development, such as during building, reorganization or technological innovation. This allows an organization to anticipate and minimize job design trade-offs. Unfortunately, research has not been conducted yet on such a setting.

During the course of completed research, it has become clear that the employee is blamed too often for poor performance. Frequently, the problem is in job design. ■

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