

sección especial en idioma inglés

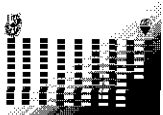
developing your management philosophy

management and environmental factors

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MODERN MAN exists and continues to exist because he has been constantly involved in organizational structures otherwise, he would have perished in the very beginning of his history. Modern man is also a product of the many organizations of which he has been a part. For organizations are merely groups of people acting together in some concerted and cooperative manner. Thus, man has always been con-

cerned with the structural form a particular organization should take. There may be one best structure for a special group at any one time and under a specific set of conditions, but there is no such thing as the best type of structure for all organizations. So man continues the search for constant organizational improvement.



Even though organizational structures vary in innumerable ways, all structures of a formal nature consist of the relationship among three components: the kinds of separate activities necessary to reach the objectives are established; the **human faculties** need to perform those activities are determined; and the **physical factors** needed by the people to perform the functions are established. And when an organization is being built, these three factors are established, analyzed, and provided in the order presented: that is, human faculties should not be employed unless it is determined what it is they are to do, nor are the physical factors obtained until it is decided what the human faculties need to perform with kinds of activities.

This paper is concerned with the physical environmental factors employed in an organizational structure.

The factors of physical environment refer to everything that is physical within the confines of the organizational structure other than the human beings themselves. Included would be the building in which the concern is located, the machinery and equipment, the paint on the walls, the lighting, the air conditioning units, and the paper clips. In a juvenile delinquent gang, physical factors may well include switchblade knives and sharp pliers to cut wire fences.

A Constant Problem for Leaders

Beginning before the use of the lever, man has always wrestled with the problem of using physical factors to aid him in his activities. Technological innovations, using the term in the broadest sense have always affected the use of skills of managers and workers. Nor is it an easy task to gain knowledge and understanding of such factors of change; the acceptance of current innovations and the specter of impending ones present a threat to everyone's security. It is of very little satisfaction to the individual worker to point out to him

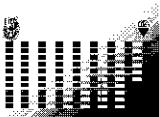
that even though his job no longer exists, technological unemployment **overall** does not exist in our country. Innovations do result in social gains as well as in productivity advances; however, many social and manpower problems occur because of them. Thus, the rise in living standards and in the nation's power may also bring about major problems in segments of the economy.

A good example of such a problem is found today in the bituminous coal industry. The digging, loading, moving, processing in the tipples, and loading into the railroad cars is almost a continuous mechanical process. Giant new machines are chewing away earth and rocks to lay bare the coal vein in strip mining. Many thousands of men have lost their jobs permanently as a result. Similar changes have occurred in the railroad industry, with electronic control systems, more centralized traffic control, faster service, and "piggy-back". The steel maker and the cotton grower, the air transportation manager and the assembly line foreman, the communications technician and the office worker—all must contend with the innovational changes necessary in a fast-moving and competitive economy. The leaders and managers in all kinds of organizations must utilize all the decision-making skills at their command to determine what are the practical changes to be made in the physical factors to be used by their personnel.

And what are the criteria that a good administrator must use today in making such a decision? It is all very well for the manager in a business concern, for example, to use the profit motive as a key criterion, but he cannot ignore the many other objectives such as the social and service goals. The net effect of contemplated technological changes must be considered.

Human fatigue

A major purpose behind the decision to make changes in physical environmental factors has



to do with the reduction of human fatigue in performing work. Long before the building of the pyramids of Egypt, man began to search for ways to accomplish work with less expenditure of human energy. The human body, wonderful and complex mechanism that it is, possesses definite limitations in performance; and the challenge to organizational leaders is to try to determine the finest conditions under which this "human machine" performs in the most satisfactory manner. Frederick Taylor and the Gilbreths were among many who have made studies which highlighted the human approach to work problems.

The term **fatigue** has no precise meaning in the literature today. But, from the standpoint of its relationship to physical factors in the work environment, a meaningful interpretation may be formed. Fatigue is the effect that activity has on the mind and body of the person which brings about less, or poorer quality production, or both, and which is alleviated by rest or change. Fatigue results in less ability to work and a feeling of tiredness.

Usually when we think of fatigue, we think of physiological fatigue. This is the fatigue which results from the use of the muscles of the body. Lactic acid is formed, and this tends to interfere with the use of the muscles. A feeling of physical tiredness results. Physiological fatigue may be measured somewhat by analyses of the blood, checking the respiratory system, checking the heart rate, etc.

However, what has been called psychological fatigue is quite a different problem. This type, also called mental fatigue, takes place and varies because of the particular human characteristics of the person. When psychological fatigue is present, the mind may wander away from the work, the individual may become listless and inattentive, he daydreams, and becomes bored. Often, of course, both kinds of fatigue occur at the same time, resulting in what is commonly called industrial fatigue.

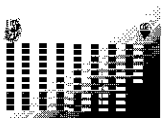
The productivity curve of the worker measured at regular intervals throughout the work

day may indicate what kind of fatigue is present. If productivity varies solely because of physiological fatigue, performance will start at a comparatively low rate and gradually rise to a peak about midmorning then decline until noon; in the afternoon the work curve will be similar except the peak point may be reached about two o'clock, assuming the worker goes back to work at one o'clock. However, if productivity varies because of psychological fatigue, the production curve may be almost the opposite. The worker performs well during the first hours of the work day, gets bored at mid-morning and slows his production, then he does better just before noon since he is looking forward to being relieved from the boredom of his job. His rate of production may also rise just before noon if he looks back at the morning work and realizes he has not accomplished much. The after noon work is similar. Of course, there are countless variations of such patterns, but the above described ones may be common in the average industrial job.

Regardless of whether the fatigue is physical, mental, or a combination, there is less will to work and a drop in productivity. Undue fatigue may result from causes over which the manager has little control. The worker's health may be poor, he may have insufficient diet, or he may be emotionally unstable. Unsatisfactory home conditions or the worker's pattern of behavior away from the job may also cause unnecessary fatigue on the job. Nevertheless, there are many things that the manager can do concerning the direct work surroundings which will help to solve the problems of human fatigue on the job.

Environmental Factors and Fatigue

The manager would not hope to eliminate worker fatigue entirely, but he can help to reduce it by analyzing some of the following factors which are likely to have a bearing on the problem. Analyses of such components will often point up areas for possible improvement.



The work period

Night work still presents a problem. However, the greater fatigue of the night worker probably, results from the fact that he does not get sufficient rest and sleep during his off time. The length of the work period is usually not a great factor in fatigue in the modern industrial plant today. Excessive overtime, however, may cause difficulties since it is well known that productivity rates drop rapidly after a certain number of hours of continuous work.

Physical requirements

Again the modern job demands less in the way of muscular exertion as heavy work diminishes as a result of material handling and work processes becoming more mechanized. In work situations where the physical demands are great, labor-saving devices can be installed or longer and more frequent rest periods may be given.

Noise

The interesting and difficult thing about the factor of noise is that what is noise to some personnel is not a disturbing element to others. Some people appear to adjust quickly and readily to the noise of the work environment; others in the same situation find it a constant wear upon their nervous system. Nevertheless, experiments have indicated that noise does affect productivity, and noise abatement programs have increased output. The noise problem may be at least partially solved by changes in equipment design, damping, screening, machine suspension, and other methods.

Light

The diffusion, direction, and distribution of light has a great effect on the worker because of the possibility of eye fatigue. Glare, for example, is one of the most common faults. Light of the proper quality and quantity not only

helps to raise production, but studies have shown that it will also reduce accidents.

Temperature and ventilation

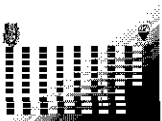
It has been found that industrial production drops by 2 to 5 percent because of summer heat. In addition to temperature, the manager should be concerned about the possibility of fumes, gases, and odors. The presence of such unpleasant factors in the atmosphere can cause unfavorable morale and a drop in production.

Music and color

The effect of painting the work surroundings in various patterns and designs of color and of playing music while employee are at work needs further investigation. People will react in quite different manner to the playing of the same music or to the same color scheme in their work areas. However, indications are that music and color usually do affect productivity in a favorable manner.

Monotony of the job

Perhaps the major fatigue problem in this country today is not physical but mental. Employment managers are constantly looking for better ways to find the right person for the right job and thus help to reduce psychological fatigue. The problem is magnified because monotony depends upon the reaction of the individual. Normally one would consider a job with repetitive, short-cycle work to be monotonous. However, many employees do not appear to notice monotony in jobs of such nature. On the other hand, jobs with very long cycles and considerable variance in activity are monotonous to many. The job analyst has long been challenged by the problem as to why one person finds a particular job interesting and another person finds it extremely dull. As yet he has not found any definite answer. The first line supervisor with an untold number of different tasks may find his job uninteresting



while the man doing a simple, repetitive task on the assembly line may find his job intriguing. Sometimes the importance of the job gives it added interest—in time of war, very expensive equipment, extremely delicate work, etc.

Nonetheless, if the manager realizes that a job is dull and monotonous he has two possible ways by which the situation can be somewhat alleviated. He may simply transfer the employee to another job with less boring aspects or he may try to change the duties of the job. Oftentimes jobs can be combined, or the tasks of the same job can be combined, lengthened, or shortened.

A Final Note

Decisions of all leaders in all kinds of organizations hinge about three major components: functions or activities, human faculties under their guidance, and physical environmental factors. The most thorough study and

use of any two of these will be of little value without the same approach to the other. The manager's problem, of course is how best to coordinate the three to achieve the most effective results. In the area of physical factors used in work situations, the American manager will have greater need for adaptability in the years ahead as technology changes our organizations. Displacement of workers and the withering away of jobs in certain segments of the economy will continue, and the costs of advancements brought about by technological innovations must be borne by all. Leaders in all kinds of organizations will have an added responsibility of finding ways to cushion the impact of unemployment. The search for ways to raise man-hour productivity will continue also as the efforts to substitute mechanical energy for human energy are accelerated. Thus, the great need for flexibility underscores the philosophy of broad education and training for the manager of the immediate future as well as in the more distant years.



