Article

"The Effects of Job Design on Turnover, Absenteeism and Health"

A. Mikalachki

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The Effects of Job Design on Turnover, Absenteeism and Health

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The purpose of this article is to show how the deleterious consequences of personnel turnover, absenteeism, and occupational illness are related to job designs which are inappropriate to the needs of workers.

In the seventies, mass production industries have been faced with problems of personnel turnover, absenteeism and occupational illness. In the automobile industry, the epitome of mass production, high annual turnover and absenteeism are common. Instances of impaired health of blue collar workers caused by their work activities are also noted with increasing regularity. *Work in America*[1] presented data showing the relationship of job dissatisfaction to the incidence of ulcers, heart attacks, and respiratory ailments. This report indicated that job-related stress contributed more to heart attacks than any other single factor.

Assembly lines have significant problems from which both the organization and the individual lose. Through turnover and absenteeism production cost has increased excessively. Through high occupational stress the individual's health and well being are deteriorating. The purpose of this article is to show how the deleterious consequences of personnel turnover, absenteeism, and occupational illness are related to job designs which are inappropriate to the needs of workers.

Figure 1 is a preliminary model for understanding the function of job design in mass production industries. In brief, individual motivation is viewed as a function of environmental forces. Individual motivation relates to job design so as to determine the workers degree of job satisfaction. Degree of satisfaction is in

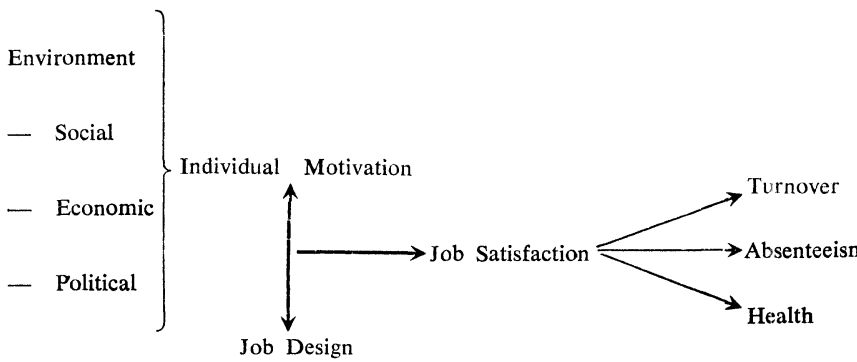
MIKALACHKI, A., Professor of Business Administration, University of Western Ontario, London, Canada.

[1] *Work in America,* Report of a Special Task Force to the Secretary of Health, Education and Welfare. The MIT Press, Cambridge, Massachusetts, and London, England.

turn, related to the turnover, absenteeis, and illness occuring in the organization. This simple model will be elaborted upon and clarified by applying it to recent experiences of the Volvo Company of Sweden which recognized the importance of job design and undertook to do something about it.

FIGURE 1

Model for Understanding the Funtion or Job Design



THE VOLVO EXPERIENCE

In the late 60's and early 70's Volvo had a very high turnover rate (40 to 50%) and a high absenteeism rate (15 to 20%) among its blue collar workers [2]. To understand these problems better, its management analysed the turnover and absenteeism data and found that 30% of the employees accounted for 80% of the absenteeism, and that turnover and absenteeism were directly related : as turnover increased, so did absenteeism. In addition, turnover fluctuated with general economic activity : turnover rate increased with increasing job availability and vice versa. Volvo management realized that to use this information, they must understand what motivated individuals and how that motivation is related to the jobs they do.

Figure 2 compares individual motivation and job expectation in two periods. In the « survival » period (1900 to 1960 approximately) blue

[2] Most of the information on Volvo was obtained during a conference on work environment conducted by Volvo personnel in October, 1973.

collar workers operated at physiological and security need levels [3]. These need levels, which create a desire for long-term job security with sufficient pay for food, shelter, and clothing were more valid in the early 1900's than in the 50's and 60's. The 1960 date was chosen arbitrarily and is not easily defended. However, during this period job content was controlled by employers, as there was an abundant supply of blue collar workers seeking jobs.

During the period of « growth environment » (1960 - 1973), individuals were motivated by social needs, for group membership, and ego-needs for respect and self-esteem. Job expectations of blue collar workers during this period were for on-the-job status, recognition and challenge, considerate relations with their supervisors and peers, security, salary and promotion opportunities, and acceptable working conditions. [4]

FIGURE 2

Relation of Needs to Job Expectations

	SURVIVAL ENVIRONMENT (1900 to 1960)	GROWTH ENVIRONMENT (1960 to 1973)
INDIVIDUAL MOTIVATION	• Physiological • Security	• Social • Ego
JOB EXPECTATIONS	• Job Security • Sufficient Pay for Food, Shelter and Clothing	• Status • Challenge • Considerate Supervision • Peer Relations • Pay • Promotion • Working Conditions • Security

[3] Need levels as a source of motivation is taken from A. H. MASLOW, *Motivation and Personality,* New York ; Harper and Brothers, 1944.

[4] This point is well documented in the *Work in America* report and investigations conducted in Oslo, Norway in the early 1960's by the Work Research Institute and others.

Thus, in the period 1960 - 1973 the individual's motivation to satisfy social needs and ego needs was far different from that of the survival environment. Numerous social, economic, and political factors have generated this new level of motivation. As Sweden is a very socialized country, mass social welfare has satisfied the Swedes' physiological and security need levels. Moreover, they have the opportunity of obtaining higher education, and many take advantage of that opportunity. Consequently, those coming into the labor force in 1971 and 1972 had a significantly higher education than the bulk of employees in the auto industry in 1969. Education plus social welfare have caused many blue collar workers to function at social and ego need levels.

We now turn to the nature of the job design, both content and context, from the period 1960 - 1970 in the various Volvo assembly plants. The job content was primarily that of an assembly line. That is, the work cycle was of a short time interval and was continual throughout the day. The work was boring and repetitive, requiring very little thought or involvement on the part of the employee. The job demanded repetitive movements which caused physical and mental wear and tear. The context (or environment) in which the job took place was noisy, untidy, impersonal. The worker did not feel he belonged to any group nor was he particularly loyal to the growing amorphous company. Significantly, as the number of workers in a plant increased, the turnover percentage also increased. Workers lost their identities and job interest, even though the job provided a high degree of job security and a reasonable salary.

The satisfaction workers derived from jobs at Volvo was related to individual motivation, which in turn was related to job design. That is if worker motivation is for group identification, respect, and self esteem, being a member of an impersonal assembly line performing boring, repetitive tasks is frustrating. In 1970, the job design in Volvo was much more compatible with the motivation of individuals having physiological and security need levels. However, since most of the labor force coming into the market in 1971 - 72 had higher need levels, the impersonal assembly line was quite incongrous with their needs.

In Sweden additional factors affected the individual's need levels and response to the job design. For example, daily practices involved him in decision-making both in his home and in his school. He became accustomed to participating in major decisions that affected his life. The impersonal assembly line did not permit any personal involvement. Econ-

omically, Sweden was moving into a period of high economic activity and labor shortage. Consequently blue collar workers had many job choices and frequently chose jobs designed to satisfy their need levels, not blue collar mass production jobs.

A general diagnosis of the Volvo situation during 1960 - 1970 is presented in Figure 3. Social, economic, and political factors generated individual motivations incongrous with the existent job designs. This incongruity resulted in high job dissatisfaction and the attendant consequences of high turnover, high absenteeism, and illness.

Volvo and others have attempted to circumvent the difficulty by importing immigrant labor for repetitive tasks. [5] Immigrant laborers have been effective on a short term basis in that they will perform any tasks to accumulate funds quickly and return home. In Sweden, however, there were simultaneously both a labor shortage and high native unemployment. Consequently, the government restricted immigration to force Swedish companies to use native labor, male and female, for these jobs. When this occurred, Swedish industry again faced the problem of individual motivations being incongrous with job design.

SOME ATTEMPTED SOLUTIONS

Volvo has approached the problem of job dissatisfaction by endeavoring to change both the content and context of blue collar work. One major change in job content was the introduction of integrated teams, uniting foremen, engineers, maintenance staff, quality control staff, and production workers into one team responsible for output. In effect the personnel responsible for production input are also responsible for the output. A number of teams work together on various subparts of the assembly ; each team is given a high degree of autonomy. Work is allocated to the team, and within certain parameters it is responsible for defining the workflow. A number of current industrial management ideas are used to define workflow. Job enlargement to reduce boredom, job rotation for the ergonomical benefits and reduction of boredom, job enrichment encouraging the use of increasing worker skill are all used. The challenge of the job is significantly increased as members learn more than one specific job and take responsibility for their output.

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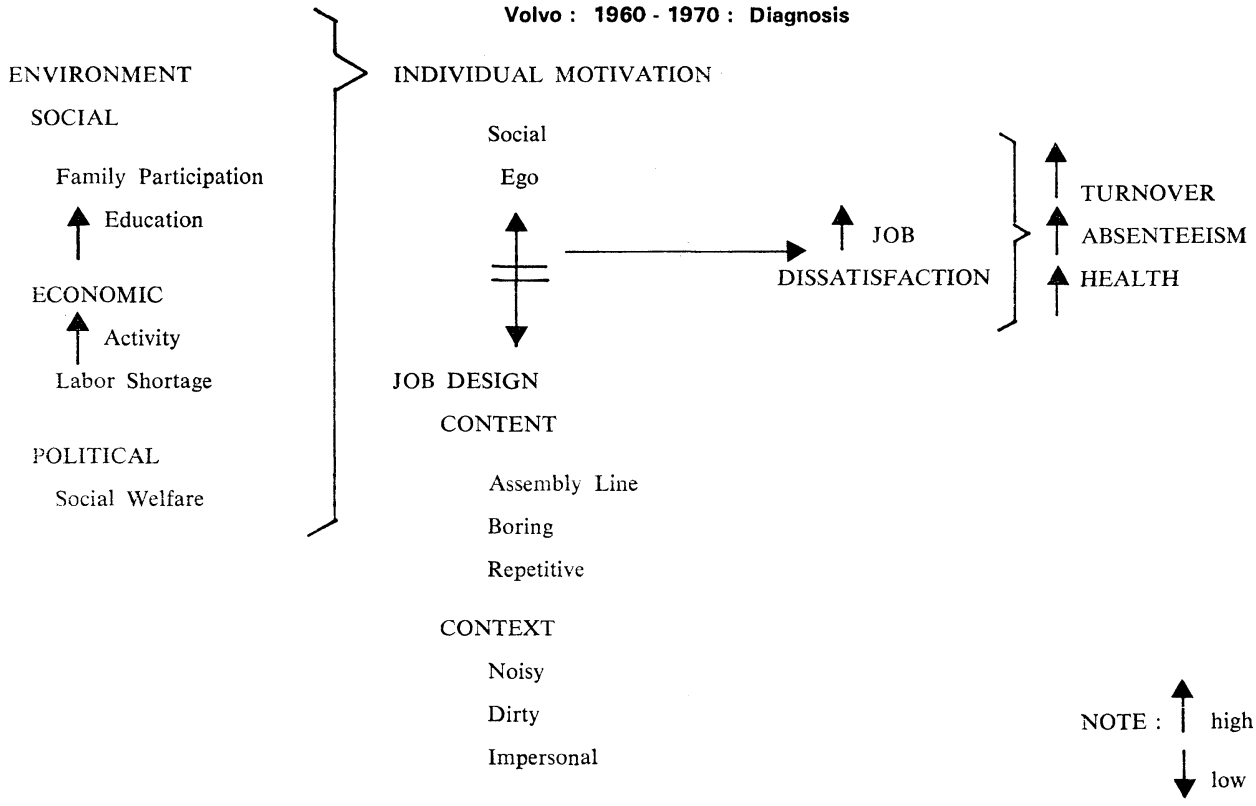
[5] Volvo started hiring foreign workers to a large extent during the 1968 to 1972 period.

FIGURE 3


Volvo : 1960 - 1970 : Diagnosis
ENVIRONMENT
SOCIAL
Family Participation
Education
ECONOMIC
Activity
Labor Shortage
POLITICAL
Social Welfare
INDIVIDUAL MOTIVATION
Social
Ego
JOB DESIGN
CONTENT
Assembly Line
Boring
Repetitive
CONTEXT
Noisy
Dirty
Impersonal
JOB DISSATISFACTION
TURNOVER
ABSENTEEISM
HEALTH
NOTE : high
low

In terms of job context, each team is allocated a territory which it designs and manages. This territory includes both social and work needs and provides the opportunities for the satisfaction of social needs. In addition, training programs enable workers to learn their own area's jobs and allow them to take higher level jobs in the organization. Promotion from within is used as much as possible by Volvo. And finally, the employees are involved in the decision-making process at all levels in the company, including two representatives as members of the board.

The change in job content and context has dramatically altered the foreman's role. In the new design the average foreman manages 40 to 50 subordinates formally organized in four or five teams rather than 20 subordinates at varying degrees of informal organization. The foreman works with the team leader who is responsible for many time consuming daily tasks such as material handling and production scheduling. The new design provides the time for the foreman to engage in personal contract with operators and develop long-range plans for his department. This is a significant change from his previous role of crises management and production control.

Volvo has patterned the job to the employee's levels of motivation. The social needs of the individual can be satisfied by his being a member of a team in a clairly designated area which is managed by the team. Ego or achievement needs can be satisfied by the challenge of job enlargement, job enrichment, education and promotion opportunities, and the involvement in the decision-making process within the organization. In addition to satisfying the workers' needs, the job restructuring enables the organization to use the skills and capacities of those who are working daily on the product. These skills and capacities are major resources which have contributed numerous job design improvements.

SOME RESULTS

In terms of results, data from the Volvo Lundyverken (truck) plant in Göteborg was selected because more re-design was introduced there than in any other Volvo plant. The data is from the October, 1973 conference presented by Volvo in Göteborg.

Figure 4 shows the rather dramatic decline in turnover at the truck plant. Turnover was approximately 50% in 1969 when major re-designs were introduced into the truck plant. The turnover has fallen so dra-

matically that it is expected to be approximately 8% in 1973. This is in contrast to the turnover in the Göteborg area where possibly as a reflection of declining economics activity, it declined from 42% in 1969 to 30% in 1972.

The rate of absenteeism in the truck plant has not been significantly affected by the new design. One explanation for the lack of change is the social security system in Sweden. Employees absent from work for seven days or less are paid an amount only slightly less than their ordinary wages by the government. Some Volvo managers feel that this form of compensation is an incentive to absenteeism.

Figure 5 indicates the hours of repair per truck required from 1969 to 1973. They dropped significantly : from 3½ hours per truck in 1969 to 1½ hours per truck in 1973. Volvo personnel feel that this improvement results from improvement in technology as well as in job re-design.

At this point incorporation of experience of other companies with changing job design to include greater scope of worker judgement and involvement is useful. An article in the October 18, 1973 *International Herald Tribune* enumerated the results of major job re-design by Gränges AB in Stockholm :

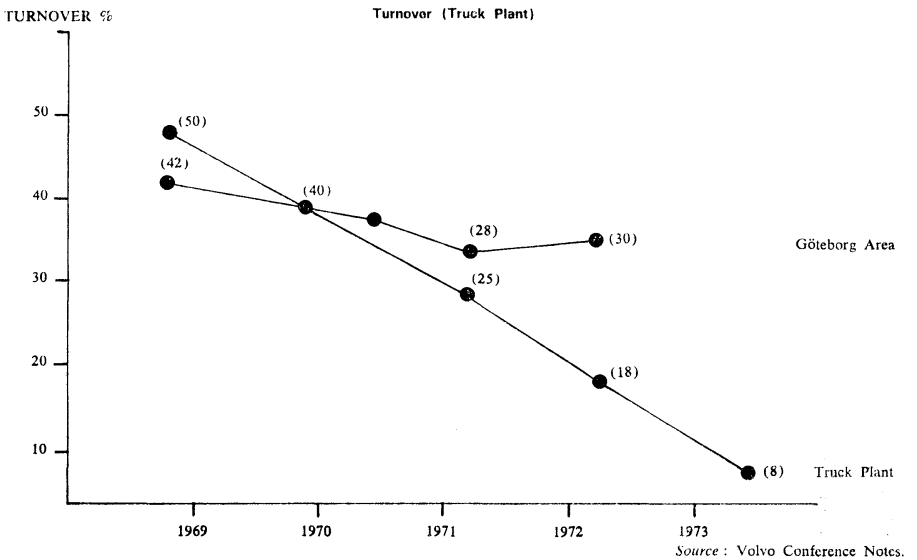
> « In a 60-men die casting foundry near Stockholm, the work force was reshaped into small groups with authority to plan and assign the work among group members. Supervision was reduced, and a management worker committee was formed to oversee production and personnel problems.
> After 18 months, productivity at the foundry rose 45%, employee turnover dropped from 46% to 18% and spoilage dropped from 4.6% to 3%. Attitude survey showed employee morale to be exceptionally high compared with other Gränges plants. »

Similar job re-designs carried out in the U.S. have also shown dramatic results. Texas Instruments, as noted in the *Work of America* report, within a 2 year period, decreased the turnover rate from 100% to 10% and reduced the number of employees required from 120 to 71, while showing significant increase in performance. Numerous similar examples noted in the *Work in America* report illustrate that Volvo's experience is not unique.

VOLVO'S KALMAR PLANT

In the construction of a new passenger car assembly plant in Kalmar, Sweden Volvo is taking advantage of its experience at Göteborg. The

FIGURE 4



Source : Volvo Conference Notes.

FIGURE 5

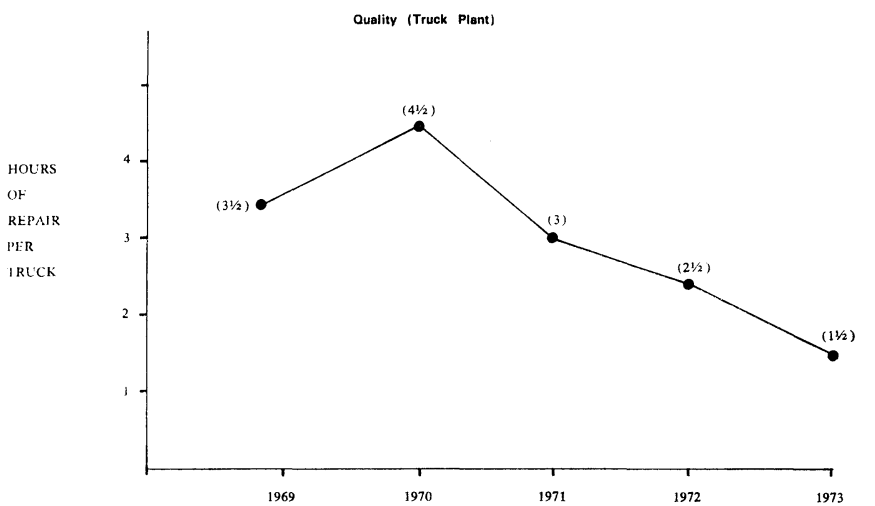
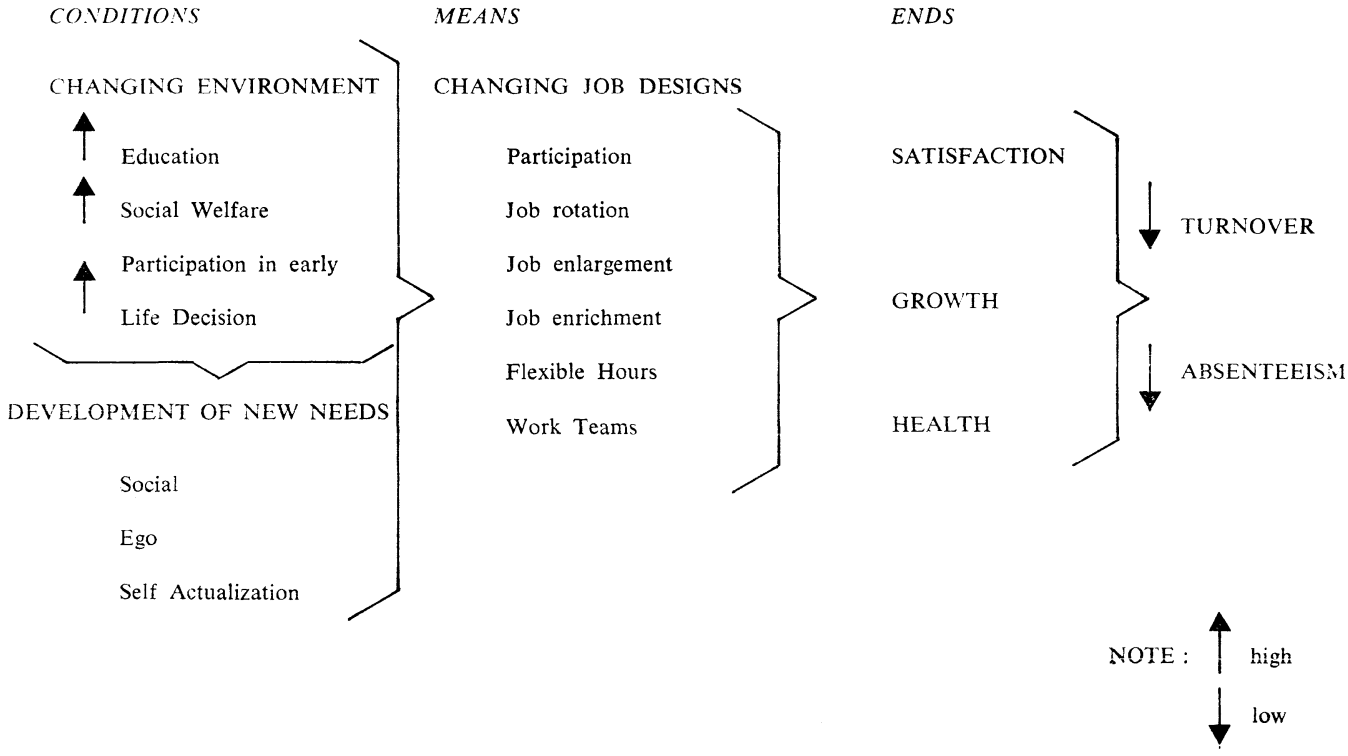


FIGURE 6

A Generalization



plant will incoporate the ideas of work teams in existing Volvo plants. The cost of the Kalmar plant is Sw. Kr. 100,000,000 — 10% of which is needed for the new design ; that is, if the new design had not been taken into account and a regular assembly line plant established, the cost would be Sw. Kr. 90,000,000. The Kalmar plant will use integrated work teams ; there will be 17 teams of 15 to 20 workers and each team will be responsible for a system such as upholstery, engine, wheels, or brakes. Each team will have its own work territory with adjacent rest and recreation facilities. Each team will decide the work flow with work cycles varying from 3 minutes to 1 hour. The flow of materials throughout the plant is electrically controlled and can be varied within specific limits between teams. In addition there are sets of interlocking, advisory councils that will involve the employees in decisions made at all plant levels. The Kalmar plant will be in operation in February 1974 and the results of this re-design will begin to be seen in the year 1975.

Many factors will be tested in the Kalmar plant. In addition to the production problems which constantly come up, there are also interpersonal and group problems. The question of whether all employees can work effectively in groups must be answered. In addition, the composition of effective groups in terms of individual characteristics and interpersonal relations must be decided. And finally, the variability of group productivity will have to be investigated : for example, one group produces at such a high rate that they are blocked either by the slowness of the group ahead or by the lack of a sufficient buffer area between it and subsequent groups. This tie-up has already been experienced in existing plants where some teams complete 8 hours work in 6½ hours and would like to go home.

CONCLUSION

The Volvo experiment, coupled with other European and North American experiences, provides sufficient data to generalize the concept of appropriate job design. Figure 6 is such a generalization. In a changing environment where blue collar workers have more education, increased social wefare, and participation in early-life decision, it is very likely that these people will not be active at physiological and safety need-levels but instead at the higher social (affiliative) and ego (achievement) need levels. The dominance of these need levels requires the possibility of their satisfaction, particularly in terms of job design. There is a need for increased worker participation, job rotation, job enlargement, job enrich-

ment, flexible hours, and establishment of work teams. Change in design in relation to the existing needs will result in job satisfaction, growth and development, and a significant improvement in health and well being. Increased personal satisfaction, growth, and health will in turn reduce turnover and absenteeism.

In terms of the generalization, changing job designs should be recognized as a means and not as an end. To regard any of these dimensions as a panacea is to confuse means with ends. We must constantly focus on changes in the social, economic and political dimensions, of the environment to determine the current need levels at which people operate. At any need level, there are a number of means, only some of which are now recognized, which can be used to satisfy those needs. The ingenuity of men will undoubtedly develop new designs to satisfy needs which will ultimately result in high satisfaction, growth, and health. Thus, we must search for job designs which are complimentary to individual needs if we are to have personal satisfaction and consequently to avoid turnover and absenteeism.

Les effets de la restructuration des postes de travail sur le roulement de la main-d'oeuvre

Cet article présente un exemple hypothétique qui a pour objet d'illustrer comment des modifications dans le milieu du travail peuvent montrer dans quelle mesure la restructuration des postes de travail favorise la réduction du roulement de la main-d'œuvre et de l'absentéisme tout en accroissant le bien-être des travailleurs. Une grande partie des données sur lesquelles s'appuie ce modèle proviennent d'expériences tentées aux usines Volvo en Suède auxquelles s'ajoutent des constatations semblables faites en Amérique du Nord et en Europe. Le modèle montre que les transformations dans le style de vie politique et familial ainsi que dans le système d'éducation répondent à certains besoins personnels et en font naître de nouveaux. Il faut que ces besoins nouveaux trouvent satisfaction dans le contenu des emplois et dans la structuration de l'ensemble des postes de travail si l'on veut que le travailleur garde assez d'intérêt pour demeurer au service de l'organisation et jouir d'un certain bien-être. Une enquête faite chez Volvo entre 1960 et 1970 a démontré que des travailleurs dont la motivation se situe à des niveaux de besoins personnels et sociaux élevés à cause du milieu social et politique ambiant, selon la théorie de Maslow, ne peuvent être satisfaits de l'activité assomante, répétitive de la chaîne de montage dans une atmosphère bruyante, malpropre et impersonnelle. Le résultat de ce tiraillement entre la motivation personnelle et la structuration des postes de travail se traduit dans une large mesure par de l'insatisfaction au travail (anxiété physique et mentale), cause de taux de roulement de main-d'œuvre de 50 pour cent et d'absentéisme de 18 pour cent à l'usine d'assemblage de camions Volvo.

Reconnaissant le problème primordial de la restructuration des postes de travail, Volvo fit l'essai en 1970 de modifications dans le contenu des emplois : rotation des emplois, valorisation des postes, extension des tâches. On changea les conditions d'exécution du travail en formant des équipes de travail auxquelles on confia, en tant qu'équipes, la responsabilité d'un certain espace dans l'usine et dont on encouragea la participation à tous les niveaux de l'entreprise. En 1973, on se rendit compte que des changements marquants s'étaient produits dans cette usine : le taux de roulement de la main-d'œuvre était tombé à 8 pour cent et la qualité du travail s'était accrue de moitié, tandis que le taux d'absentéisme était demeuré à peu près le même, fait qu'on expliquait par le système de sécurité sociale suédois qui semble favoriser l'absentéisme.

L'expérience de Volvo, confirmée par d'autres expériences tant en Europe qu'en Amérique du Nord, fournit suffisamment de données pour mettre au point un modèle hypothétique de structuration des postes de travail. Selon ce modèle, la structuration des postes de travail n'est pas une fin, mais un moyen. Considérer toute entreprise de structuration des postes de travail comme une panacée pour assurer la satisfaction au travail équivaudrait à confondre la fin avec les moyens. Pour chaque niveau de besoins, on découvre un certain nombre de moyens, dont quelques-uns seulement sont connus et auxquels on peut recourir pour satisfaire ces besoins. L'ingéniosité de l'homme trouvera sans doute de nouvelles formes de structuration des emplois qui conviennent à des besoins nouveaux dont le résultat se traduira par un haut degré de satisfaction, d'épanouissement et de santé. Aussi, devons-nous rechercher des types d'aménagement des emplois qui correspondent aux aspirations de l'individu si nous voulons que le travailleur vive satisfait et que soient évités roulement de la main-d'œuvre et absentéisme.