



“Summary of article By Heidi I. Hartmann, Robert E. Kraut, and Louise A. Tilly: Effects of Technological Change: The Quality of Employment” in Frontier Issues in Economic Thought, Volume 4: The Changing Nature of Work. Island Press: Washington DC, 1998. pp. 157-161

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### **“Summary of article By Heidi I. Hartmann, Robert E. Kraut, and Louise A. Tilly: Effects of Technological Change: The Quality of Employment”**

This paper examines the effects of new technologies -- especially those associated with information -- on the quality of employment. Do such technologies depreciate the work experience through fragmentation, electric monitoring and deskilling, or enrich it by increasing task integration and autonomy and upgrading skill acquisition? "These issues are especially germane to women, because as clerical workers, bookkeepers, nurses, librarians, and other direct users of information technology, they are likely to be affected in large numbers. In addition, their relative lack of power in the workplace suggests that if information technology has pernicious effects, they will bear its brunt." [127]

#### **EVIDENCE FROM SURVEYS AND STUDIES**

The aspects of employment quality that are reviewed here are: first, job content, which encompasses attributes that are intrinsically part of the work; second, working conditions, both physical and social, which influence worker satisfaction; and, third, economic considerations, which include the compensation, benefits, security, and promotion possibilities associated with a particular job, occupation, or workplace.

At this time there are inadequate data on which to base quantitative, systematic answers to the questions posed in this paper. On the one hand, some studies have documented situations in which the introduction of new technology coincided with a fragmentation of jobs and a decrease in the skill levels required to do them. Such fragmentation is not necessarily caused by the new technology, but it facilitates an ongoing process of routinizing work concomitant with decreased work variety, reduced challenge levels, and less responsibility. Researchers have also identified cases in which technology incorporates substantive knowledge, leaving less for a worker to know. For example, "[i]n the insurance industry, the skilled work of assigning risks or assessing claims has increasingly been codified into computer software, so that less skilled, less experienced, and less educated clerks can perform the work once performed by skilled clerks and professionals." [137]

On the other hand, if the most routinized jobs in an industry are the first to be automated, the remaining job mix may be of a higher quality. Following this line, some researchers argue that new office technologies can reintegrate jobs that were fragmented for other reasons, and can require more skill. After all, new skills are required to master the technology itself. Automation may also increase worker responsibility and the need for cooperation.

Existing survey research does not directly address the effects of technology on employment quality, while research that studies the relationship indirectly should be viewed with caution. However, existing surveys, which may be used as a point of departure, "suggest that workers who use information technology are generally satisfied with it, because it allows them to do their work better and because it improves the jobs themselves, or, at a minimum, does not degrade them significantly." [134]

## **GETTING BEHIND THE STUDIES**

Differing views on the effects of technology are in part a result of "comparisons of experiences at different stages in the evolution of the technology, variations in the uses of the equipment, and differing social and economic circumstances under which new technology is introduced." [139] Another reason for disagreements in the research literature has to do with the level at which work units are analyzed. Part of a job may be rendered less challenging when, for example, it is done on a computer, but the time saved thereby may be used for new, more interesting tasks. Thus the effect on the whole job may be different from, and more positive than, the effect on one particular aspect.

Comparisons become even more difficult when we recognize that, when new technology reduces the overall skill requirement for a particular job, that job may be turned over to a different individual -- perhaps a labor force entrant with less employment experience and education -- while the incumbent workers may, on the one hand, retire or be laid off; or, on the other hand, they may be transferred or promoted. Obviously, workers' perceptions of the effects of technology will be strongly affected by which of these possibilities eventuate for them. The subtlety of these issues is captured in the observation that, while "the deskilling of some white-collar jobs may be the vehicle by which less advantaged social groups gain white collar work... for the same reason, less advantaged workers may face greater job insecurity because those jobs may be at risk of further deskilling or elimination through new technology." [142]

Overall, the skill requirements for the labor force as a whole depends greatly on the evolution of industries; especially on how the better and worse jobs are distributed among the growing and the shrinking industries. The present state of knowledge does not make it possible to determine which trends are currently dominating. However, it is sure that the changing skill requirements that accompany continuous technological change are bound to produce gaps between workers' skills and job requirements. These gaps are a problem that requires attention on their own.

## **WORKING CONDITIONS**

Three aspects of working conditions will be considered here. The first has to do with the extent of monitoring. New information technology increases the amount of evaluative information that managers can collect and analyze about their workers and that can be used to monitor workers more closely. Whether or not managers choose to do so is a social choice. While productivity monitoring may have positive and/or negative effects, many organizations that have the technical capabilities choose not to monitor their workers on an individual level.

A second area where technology is thought to affect working conditions is the possibility of telecommuting and the electronic distribution of work. Telecommuting is the use of computers and telecommunications equipment to work at home or in other locations away from a conventional, centralized office. Because so little telecommuting occurs, it is impossible to get convincing evidence on whether it is a positive alternative work arrangement for those with home and family responsibilities or simply a continuation of the traditional exploitation of isolated, predominantly female workers. This issue can be illuminated by examining home-based work more generally, in which flexibility in employment is usually gained at the price of lost income.

Another important aspect of new information technologies involves ergonomics -- the physical fit between people and technology. Increasing quantities of work time is spent sitting in front of computer terminals, which may cause a number of physiological and psychological complaints. In many cases, however, these technologies are introduced into jobs that would be poor anyway.

These examples do not resolve the questions raised at the outset, but instead point to the importance of management choices in how to introduce and employ new technologies.

## **THE ROLE OF MANAGERS**

Two issues dominate concerns about the impact of technology on economic aspects of employment quality: compensation and job security. To the extent that technology increases productivity, workers expect to share in the gains; they also expect to be compensated for specific skills they must acquire to use the new technology and the general education levels that technology-intensive jobs may require. Moreover, employees' fears of job loss and employment dislocation that are associated with technology can be reduced by a number of employer policies.

In fact, management practices and methods of work can be much more powerful influences on employees' job satisfaction than are the technological tools used to do the job. There is much that an organization with a concern for employment quality can do to introduce technology into the workplace in ways that use it effectively, aid the general welfare of the organization, and enhance employment quality.

However, there are many reasons, including economic conditions, interest group conflicts, and workplace cultures, why managers do not act to maximize the effective and humane use of technology. The limited evidence available suggests that the decision to introduce new technologies is typically dominated by economic considerations focusing on product selection with little or no attention to issues such as employee attitudes, skills, and behaviors, or organizational effects.

Given the ubiquity of sex segregation of jobs within firms... and the small number of women in managerial positions, many of the managers who make decisions about the technology that women will use have never held a job like the one in which the technology is being introduced. Thus, they are likely to have difficulty identifying both the full range of tasks that the technology needs to support... and the full impact that the technology will have on the quality of employment. [152]

## **THE ROLE OF WORKERS**

Worker participation affects employment quality and job satisfaction in two ways. First, it changes the contents of the decisions because it provides a mechanism through which workers' interests are represented. Second, participation may be intrinsically satisfying and lead to increased commitment to decisions, simply as a result of the process by which they were reached.

Workers cannot simply rely on the goodwill of employers to ensure that technology is used humanely. They need mechanisms to represent their interests in decisions affecting employment quality. This participation can take two basic forms: informal participatory practices, which are the activities, knowledge, and expertise that workers bring to bear on many policies; and formal rights giving workers an explicit role to play in company decision-making concerning technology. The two forms are complementary. Regardless of the basis for input, early involvement in the system design process is important, as it allows those involved to influence the nature of the goals that are set.

One of the most effective mechanisms for involving workers in decisions has been for workers actively to propose and then to provide feedback on technological design and implementation. Other mechanisms include legislation and regulation, negotiated collective agreements, and more informal discussion. The effectiveness of worker participation depends vitally on the organizational context in which it takes place and on the procedures through which it is accomplished.

In the United States, worker participation programs have been used primarily in manufacturing companies, generally with union representation. Both in the U.S. and in Europe unionized workers have negotiated technology agreements that provide mechanisms for union involvement in the implementation of technology in their industries. Because European countries have higher levels of unionization than the United States, their technology agreements have been more elaborated and more effective. Different mechanisms may be necessary in the U.S., especially to ensure worker involvement among the highly nonunionized female labor force in service industries.