

Technical Innovation And Employment

By Takashi Kawakita

The impact of technical innovation on employment has become a big social problem in industrially advanced countries and is being widely discussed everywhere. During the past two years alone, I have read the results of more than 30 surveys—questionnaires and interviews—conducted on this problem. Much of the discussion, however, has not yet gone beyond conjectures and expressions of apprehension. It is natural for people to be apprehensive about any kind of innovation or reform. However, if technical innovation were approached with fear based only on suspicion, social progress and the formation of a new industrial society, in particular, would be retarded. Therefore, I would like to delve more deeply into this subject on the basis of the findings of the above-mentioned surveys and a case study which I myself conducted.

Technical innovation and workers' consent

One of the major reasons why technical progress is advancing at a faster pace in Japan than in other advanced countries is that Japanese labor unions are either formally cooperating with or have unofficially acquiesced to technical innovation. According to the results of a questionnaire survey conducted by the Japan Institute of Labor⁽¹⁾, 37% of the 682 principal labor unions covered consented to the introduction of microelectronics (ME) equipment, while another 37% regarded it as inevitable. Only 2% were opposed. The reasons they gave for approving or considering it inevitable (respondents were asked to choose two out of the many reasons listed) were that (1) ME equipment will help raise productivity (70% of the respondents) and that (2) it will alleviate the shortage of labor (38%).

Japanese labor unions have experienced the introduction of the newest equipment in the scrap-and-build process of the heavy and chemical industries that started in the 1960s. Since the 1970s they have witnessed the installation of a great variety of auto-

mation equipment in the machinery industry. They have learned through this experience that the improvement of productivity brought about by innovation lowers the cost of products, expands demand, and actually leads to a shortage of labor rather than reduces employment.

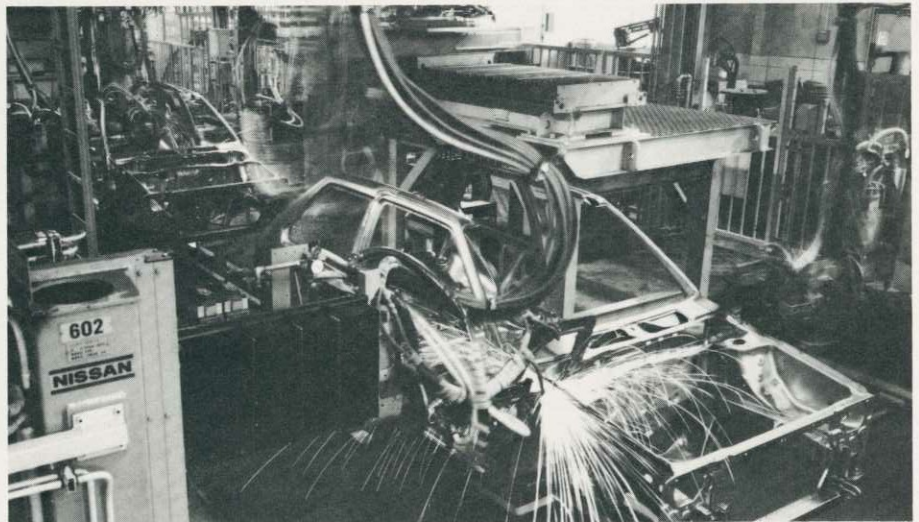
What do the workers themselves think about the introduction of up-to-date equipment? A questionnaire conducted by the Japanese Federation of Electrical Machine Workers Unions⁽²⁾, which covered 1,961 workers of five electric machine and equipment manufacturing companies, revealed that although some were anxious about their future, many recognized the positive effects of technical innovation, expressing such views as, "Work will become sophisticated, giving workers an opportunity to display their creativity" and "My labor's contribution to society will become more important."

In another questionnaire, conducted by the Kansai Productivity Center⁽³⁾ on 2,438 workers, many respondents reacted favorably to the introduction of ME equipment, although 29% felt "somewhat apprehensive." Positive responses increased as the age of the workers rose because "work has become easier." Very few

said that the adoption of ME equipment adversely affected employment or rendered special skills unnecessary.

Employment situation at firms introducing ME equipment

Foreign trade unions and pessimistically inclined Japanese intellectuals may question the above perceptions. However, these perceptions are endorsed by facts. The Ministry of Labor's Labor Statistics and Information Department surveyed 10,000 firms in the manufacturing sector⁽⁴⁾ and found that hardly any of the companies dismissed their workers or asked for voluntary resignations upon introducing ME equipment. The Ministry of Labor also conducted a survey of 2,000 businesses that had installed NC (numerical control) machine tools. The survey revealed that the volume of orders they received increased after the installation, with the result that the number of their employees has grown in the past three years. A survey conducted on 1,432 companies by the National Institute of Employment and Vocational Research⁽⁵⁾ dis-



Japanese workers in general welcome the introduction of microelectronics equipment.

Takashi Kawakita, 36, is assistant professor at the Tokyo University of Foreign Studies. He graduated from the University of Tokyo. A specialist in industrial sociology, Kawakita also serves as a staffer of the Tokyo Metropolitan Institute of Labor. He has authored various books and articles on Japanese employment problems.

closed that sales and employment tended to increase among firms that had vigorously automated production processes and installed labor-saving machines and equipment. These tendencies were observed not only among companies that installed FA (factory automation) equipment but also among those which introduced OA (office automation) equipment. A survey of 2,808 businesses conducted by the Osaka Conference for Industry and Labor Policy⁽⁶⁾ revealed that jobs had increased more at establishments that had introduced OA equipment than at establishments which had not.

On the other hand, the apprehension entertained by production workers is not entirely groundless, because their number usually decreases, even when the company's total employment increases.

A survey conducted by the All Japan Federation of Management Organizations⁽¹⁰⁾ showed that at 62% of the responding companies the number of employees decreased at the workshops where FA or OA equipment had been introduced. A survey conducted by the National Institute of Employment and Vocational Research⁽⁷⁾ on 29 companies which had introduced FMS (flexible manufacturing system) showed that the number of employees decreased at 60% of the workshops. A survey of 606 general machinery manufacturing factories by the Japan Society for the Promotion of Machine Industry⁽⁸⁾ revealed that the introduction of FMS resulted in surplus workers at 38% of the factories.

Because ME equipment is instrumental in raising labor productivity, a reduction in the number of production process workers cannot be avoided. However, as noted above, a decrease in production workers does not result in a decrease in the company's total payroll, for the following reasons:

1) Today's technical innovation not only results in labor-saving, but also helps conserve resources, energy and capital. And as well as lowering the cost of products, it improves their quality, because ME equip-

ment is suitable for small-lot production of a great variety of items. Generally, therefore, ME equipment stimulates demand and helps a company to expand.

2) In Japan, because workshop demarcations are not defined as precisely as in America or Europe, workers are able to acquire and master a wide range of skills and receive promotion within the company. As a result of this tradition, workers can be transferred smoothly to those sections which require greater manpower. The workers themselves are in favor of acquiring a wide variety of skills. Nearly 70% of 10,158 workers polled by the Employment Promotion Project Corporation⁽⁹⁾ held this attitude. In the aforementioned surveys of the National Institute of Employment and Vocational Research⁽⁵⁾ and the All Japan Federation of Management Organizations⁽¹⁰⁾, the respondent companies said that they were transferring to more labor-intensive workshops those middle- and advanced-age workers with low adaptability to new technology, while providing them with in-company training to redevelop their abilities. A survey conducted by the Japan Economic Research Institute⁽¹¹⁾ revealed that in order to facilitate smooth transfer of workers from one workshop to another, it is customary to guarantee the same wages and working conditions at the new workshop as at the old.

3) As a result of the aging of the population, the change in people's value concepts and the higher educational background of workers, the number of good-quality workers, especially young workers, who do not mind working in a production shop, is decreasing. Therefore, the policy of companies is to retain employees who have long service records and have developed skills that can be utilized elsewhere within the same company.

Social impact

Does technical innovation have the effect of restricting new employment opportunities? Many studies show that labor



Photo: Mainichi Shimbun
Apprehension still remains among workers that OA will drive them out.

will tend to become in short supply, particularly with respect to (1) highly intelligent young workers necessary for operating and maintaining new machines and equipment, (2) information processing engineers, (3) research and development personnel, and (4) sales staff to research and develop demand.

There is a possibility that female employment in simple work will decrease both in the production and clerical sectors. But job opportunities for women with probably increase in such areas as word-processing at home, sales requiring the human touch, or in planning in businesses where emotional factors have become important. To train women for such employment, school and social education systems have to be improved. As regards employment of middle- and advanced-age workers and the physically-handicapped, it is possible to apply ME equipment and technology to compensate for their disabilities. In fact, such technical innovation can be regarded as necessary.

There is a trend among small- and medium-sized companies to establish themselves as technology-intensive enterprises through the use of ME machines and equipment. It is possible that employment will increase in such smaller businesses, according to a survey conducted by the National Federation of Small Business Associations⁽¹²⁾.

Generally speaking, the companies

Bibliography

- (1) Japan Institute of Labor, "Fact-Finding Survey on Labor Unions in the 1980s" (March 1982)
- (2) Japanese Federation of Electrical Machine Workers Unions, "Survey on Impact of Microelectronics" (July 1983)
- (3) Kansai Productivity Center, "Mechatronics Innovation and Future Industrial Labor Policy" (March 1983)
- (4) Labor Statistics and Information Department of the Ministry of Labor, "Outline of Survey Concerning Technical Innovation and Labor" (August 1983)
- (5) National Institute of Employment and Vocational Research, "Fact-Finding Survey Concerning Effective Corporate Utilization of Labor Force" (September 1982)
- (6) Osaka Conference for Industry and

- Labor Policy, "Report by Microelectronization Investigation Committee" (March 1983)
- (7) National Institute of Employment and Vocational Research, "Investigation and Research Concerning FMS' Impact on Employment" (October 1982)
- (8) Economic Research Institute of Japan Society for the Promotion of Machine Industry, "Effects on Middle- and Advanced-Age Workers of the Introduction of Microelectronics Equipment" (May 1983)
- (9) The Research and Development Institute of Vocational Training of Employment Promotion Project Corporation, "Survey on Technical Innovation, Aging of Labor, and Effective Utilization of Human Resources" (January 1983)

- (10) All Japan Federation of Management Organizations, "Report of Investigation and Research on Employment Under an Economy Moving Toward Service and Information—Progress of Factory Automation and Development of Employees' Ability" (March 1983)
- (11) Japan Economic Research Institute, "Rush Survey on Effects on Advanced-Age Workers of the Progress of Technical Innovation" (May 1982)
- (12) National Federation of Small Business Associations, "Fiscal 1983 Survey" whose publication is still being prepared.
- (13) Federation of Independent Unions of Japan, "How to Cope with Employment Problems Arising from Introduction of ME Equipment (Proposals)" (September 1983)

which have erred or lagged behind in introducing ME equipment tend to be forced to reduce their work force. If this causal relationship is applied to nations, it can be said that the difference in economic vitality between countries which succeed in technical innovation and those which fail will become more and more marked. (One labor union report⁽¹³⁾ touches on this point.)

However, because there are not enough data yet on which to base a definitive con-

clusion on the future social impact of technical innovation, whatever is said at the present time should be regarded only as hypothesis.

Conclusion

At least in Japan, technical innovation has the effect of expanding employment opportunities rather than reducing them. This, however, presupposes continuous economic growth, the providing of oppor-

tunities to those who have already become skilled workers to redevelop their abilities, continuous supply of a "new breed" of high-tech workers, and labor-management cooperation in developing demand (for both goods and services). It will also be necessary to conduct public-funded research on changes in the quality of working life rather than on the volume of employment, as well as on new problems such as nervous and mental fatigue of workers, and the value of work. ●

Labor-Management Relations in Japan

By Joji Kato

Features

Labor-management relations in Japan are underpinned by three main features—lifetime employment, seniority-based wages and enterprise unions. Although different views are held on when and why these factors came into existence, they nevertheless represent the results of the industrialization process of Japan. Although they should not be explained away in terms of Japan's cultural peculiarities, it should be noted that these characteristics are largely responsible for Japan's consensual style of corporate management.

Clearly, they cannot be considered separately from the remarkable economic success which Japan has achieved since the end of World War II. And as these features remain fairly stable and are accepted by both management and labor, they merit a favorable evaluation.

Japanese workers are generally unionized on a company-by-company basis. These enterprise unions belong to national organizations such as *Sohyo* (The General Council of Trade Unions of Japan) and *Domei* (Japanese Confederation of Labor) through their respective umbrella organizations, which are formed on an industry-by-industry basis. At present about 30% of workers are unionized. This rate has tended to decline over the years, reflecting the advent of a "post-industrial society" and the development of a service-oriented economy. Nevertheless, labor unions remain a distinct social force.

Basis of labor-management relations

In Japan a business corporation is regarded as a society within a society, not

merely as a performer of economic functions. Obligatory relations between labor and management are highly developed in each corporation. Management sees it as a duty to provide employees with adequate security and benefits as well as education and training. On the other hand, employees are willing to devote themselves to improving productivity and promoting the prosperity of their company, in the belief that under the lifetime employment system a prosperous company means a higher living standard. Every regular employee is expected to stay with the same company until the time of retirement.

Normally, the first year of employment begins immediately after graduation. Wages start from a relatively low level but rise annually under the seniority system. It is notable that work and pay are not necessarily directly related.

These are broad generalizations of the basis of Japanese labor-management relations. In reality, it is far more diversified than the above description suggests—as in the case between small and large companies.

Employment and wages

The practices related to employment and wages in Japan's large corporations were more or less established in the 1950s. The following characteristics may be cited:

- (1) New graduates are hired primarily on the basis of their general abilities and personalities, rather than their qualifications for specific jobs.
- (2) Employees are given extensive education and training within their company through job rotation so that they may acquire a broad range of job-performance abilities.

Photo: Asahi Shimbun



A *Sohyo* meeting: some 30% of Japanese workers belong to labor unions.

Joji Kato is chief of the labor division of the Japan Productivity Center. Kato, 47, is the author of various books and articles on labor-management relations.