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13. QUESTIONING TECHNOLOGY AND JOBS

By Brian Martin

A typical question is "how can employment levels be maintained in the face of labour-displacing technological change?" Answers to such questions vary. Some blame unemployment on the lack of initiative or social deprivation of the unemployed. Others look to job-creating efforts by governments, or to new industries. Still others counsel acceptance and adjustment to permanently high levels of unemployment.

This sort of discussion about technology and jobs is implicitly based on certain assumptions about the nature of technology, of jobs and of society itself. Once these assumptions are challenged, new perspectives arise concerning appropriate actions to be taken. Here I briefly point out some of these assumptions, and then outline some of the implications for strategies and demands centred around jobs and technology.

Technology

In most analyses technology is assumed to be neutral, being developed on the basis of efficiency and use-value. But there is considerable evidence to support an alternative view[1]. In this view, technology is developed to serve the particular needs of certain groups in society, especially powerful groups such as corporations and government bodies. The technology that is actually developed and used is *selectively useful* for the purposes of such groups.

For example, Marglin[2] has argued that the capitalist division of labour in factories, when adopted during the industrial revolution, was not technologically superior to previous production methods. The capitalist division of labour, says Marglin, triumphed because it guaranteed a role for the entrepreneur; the factory system substituted capitalist control for the previous worker control of the pace and form of the work process.

Braverman[3] has documented extensively how technology is designed to remove initiative and control from workers and place it in the hands of management. Many contemporary examples of worker participation in and control of the production process[4] show that the design of technology for management control is not basically done for the sake of effectiveness but to maintain existing social relations between bosses and workers.

Since humans are the most recalcitrant and unpredictable elements of any large organisation, replacing labour is a key aim of economic and bureaucratic elites. Automation and computerisation represent the ultimate in control over a production process or a bureaucracy.

If technology is neutral, then the problem is how to adapt to its impact. If technology is a social product, the issue is who controls it and who benefits from it.

Jobs

In most analyses jobs are assumed to be appropriate slots for people to do valid work in an optimum fashion, for which they receive adequate compensation. But 'jobs' are not spontaneously occurring work-slots. The very idea of a 'job' is based on a number of assumptions concerning the opportunity to work, the character of work, the direction of work and the distribution of the social product. Each of these assumptions may be challenged.

(a) *Opportunity to work.* The idea of a 'job' usually assumes that those with the jobs are employees. Most jobs in a modern industrial society are either in large organisations or are strongly shaped by large organisations. The opportunity to work is conditioned and controlled by the vested interests controlling these organisations.

There are some areas where opportunities are more open — some trades, some professions, some retailing areas — but even in such areas there are often heavy restraints through government or corporate contracts and investments, through professional regulation and through market forces. When talk is made of 'creating jobs', this generally refers to creating positions which are controlled by an employer or otherwise controlled by dominant groups in society.

(b) *Character of work.* The idea of a 'job' accepts unquestioningly the character of work as created by the employer or the employment context.

There is a considerable literature concerning the way in which work organisation, like technology, is designed to ensure firm control by employers or managers over the worker[5]. Typically this involves high specialisation and fragmentation of work, prescribed sets of actions and outputs, a reduction in skill requirements for many workers and strict hierarchies in which information transfer and decision-making take place.

Specialisation reduces the worker's capacity to understand the entire operation and reduces the workers' collective capacity to take over production. Prescribed actions reduce the worker's freedom to innovate and ability to question the mode of operations. Deskilling makes workers more interchangeable and hence more replaceable and also reduces wage levels. Formal hierarchies reflect the asymmetries of control over production and also serve to divide workers and provide means for individual rather than collective advancement.

The assembly line is the epitome of a work organisation designed to control workers. However, the structuring of work for the purposes of control is much more widespread than factory work. For example, specialisation plays a vital role in reducing the potential for collective action by scientists and engineers.

(c) *Direction of work.* The idea of a 'job' accepts implicitly that the type of activity performed is specified by the employer or by the economic system as a whole. Much of the production system and the associated infrastructure is not geared to serve human needs, but instead serves the whims of elites, satisfies manufactured demand, fosters harmful addictions such as smoking

and promotes inappropriate technologies such as Concorde. Translated into the realm of employment, this means that most present jobs are partly or completely useless or positively harmful from the point of view of a rational, peaceful, non-exploitative and equitable society. In such a society the need for labour in the present sense would be greatly reduced.

— Less military production means fewer military posts.

— Less planned obsolescence means less production and less work.

— Transport organised around bicycles, planned communities and public transport means greatly reduced automotive, oil and construction industries.

— Non-hierarchical social relations mean the elimination of many bureaucracies.

— An ecologically based social ethic means fewer jobs in garbage collection and artificial fertilizer production.

— An end to consumerism as a way of life means a drastic cut in advertising work.

— An end to chemicalisation of the environment and promotion of a better diet and more exercise means a greatly reduced demand for doctors and pharmaceutical companies.

It seems that many conventional jobs are not socially useful, but exist to perpetuate the established economic structures and the place of those who benefit most from those structures.

(d) *Control of the distribution of the social product.* The idea of a 'job' assumes that pay for a job is a fair measure of the worth of the work specified for a position. The idea of a 'job' thus accepts the present distribution of the output of the economic system — except for minor redistribution features — as just or at least as unavoidable.

There are several reasons to question this. First, the existence of wealth seriously weakens any claim that each person is paid according to the value of their work. Much wealth, such as factories or computers, represents initiative and effort from many people in the past. Corporate and bureaucratic wealth is usually controlled by people who did little to create it.

A second reason to question the idea that workers in jobs get what their positions warrant is the existence of highly rewarded positions which are socially useless or harmful. Do higher salaries certify the superiority of divorce lawyers or arms manufacturers to dishwashers or fruit pickers?

Third, and most important, political and economic power is used to establish and maintain the system of unequal rewards which benefits the powerful and privileged. Is there any intrinsic reason why a manager of an automobile company — especially one noted for inefficient, dangerous but glamorous vehicles — should be entitled to more social rewards than an unpaid lobbyist for bicycle paths?

Indeed, it is amusing to imagine a hypothetical society in which those whose jobs were most rewarding in terms of satisfaction, variety, stimulation and responsibility received the lowest financial reward. If this were the case, undoubtedly there would be much greater efforts to transform or abolish boring, soul-destroying labour.

An example: computer programming

The control of technology and jobs to serve the interests of powerful groups can be illustrated in the area of computer programming. Until about 1965 almost all computer programmers were self-trained. Learning on the job was never found to be a difficulty. But in recent years it has become increasingly difficult to learn on the job, since it is difficult to get a job without undergoing fairly lengthy formal training. There have also been more and more restrictions on what a person is allowed to do in relation to computing. Formerly, people who wrote programmes also punched their cards and supervised the running of their programmes on the computer. They knew much about the physical equipment and software and its peculiarities because this knowledge was useful to them and because the information was readily available.

In recent years the running of programmes has been restricted to operators who themselves do little or no programming. Such tasks as card punching or the equivalent — now the largest job category in the computing field — are done by people knowing nothing about the programme at all. Furthermore, the division of labour is being assumed in the design of physical facilities for computing. For example, computer terminals are designed so that ordinary typists can type in information without knowing anything about its meaning. Operating systems are designed so that many aspects of the system cannot be studied except with special access or permission. And the ordinary computer user has very little say in what and how computer facilities are designed. It is increasingly difficult to learn about many aspects of computing — such as computer hardware, operating, systems programming — except in courses for specialists, since the different aspects of computing are separated off into inaccessible domains. (These comments apply to large-scale computer systems. The rapid growth of smaller decentralised installations raises different possibilities and problems.)

All these developments are rational and natural — if one assumes certain priorities. The main aim in the development of computing technology and knowledge has been profit for computer companies and usefulness to organisations, such as banks and the military, that buy and use computers. Attention therefore has been focussed on achieving the ability to perform certain tasks very efficiently, such as keeping records and accounts, without any assessment of whether those tasks are worthwhile. In the development of computer technology and knowledge it has not been a primary aim to enable as many people as possible to be involved in designing, producing, using and understanding computer equipment. Neither has it been a primary aim to foster equality and despecialisation of computer tasks. The capabilities of computing facilities are oriented towards serving the demands of business and government and not the self-expressed needs of the people. This can be seen as at least partly the result of the development of these facilities being out of the hands of the people[6].

Social control off the job

I have described a number of ways in which technology and possibilities for work are structured so as to maintain inequitable political and economic structures. These structures both serve the interests of elites and also thwart the possibilities for change. There are also a number of social mechanisms by which the life situation of the worker (and the 'non-worker' as well) is structured so as to inhibit collective action for social change.

(a) *Consumerism.* Acquisition of material goods as a fundamental goal of life is a widespread phenomenon in modern capitalist societies. It seems reasonable to argue that materialist attitudes and strivings serve to displace and substitute for fundamentally satisfying goals such as self-management[7].

(b) *Escapes.* The avenues for escape from the paramount reality of work and life are becoming more and more available and acceptable. the most noteworthy escapes are television[8], drugs, sex and gambling. Each of these has obvious ties with consumerism.

(c) *Infrastructure.* The infrastructure of present reality ranges from transport systems to professional control over services. The infrastructure of physical facilities, established knowledge, skills and routines is oppressive because it makes it much more difficult, both conceptually and operationally, to move towards alternatives.

The work week

In spite of large increases in productivity, the average working week for full time employees has scarcely changed in 40 or 50 years[9]. It is possible to see a number of consequences of a longish work week which are very useful to employers. First, overhead costs are lowered. Second, there is a larger pool of unemployed, resulting in lower wage levels. The larger possibility of unemployment also encourages workers with jobs to more closely toe the line. Third, those workers with jobs are more closely tied to their work than would be the case if the work week were say 20 hours. Fourth, by providing more pay to workers with jobs, workers and their families often become attached to particular life styles. This attachment includes financial debts and psychological factors such as striving for status via material goods. In any case, it becomes more difficult for workers collectively to challenge employers or even just to leave individually. Fifth, the worker has much less spare time to become involved in outside activities, including union participation and citizen action groups.

The opportunities for social action opened by the introduction of the 40-hour week — itself a notable achievement for the labour movement — have been vitiated by consumerism, escapes and other off-the-job social control mechanisms. The resistance by employers to a further shortening of the work week may indicate their intuitive recognition of a threat to their ability to retain control of the work force[10].

Rationalisations

The inequitable political and economic system is propped up by its own rewards, opportunities and very existence. Technologies, the organisation of work and other social control mechanisms serve to dampen challenges to the system. But there are also explanations convenient to managers and workers alike which are used to justify or gain acceptance or tolerance for the status quo.

The notion of the neutrality of technology is one such 'explanation'. Another is the idea that 'jobs' are natural products of a just economic system. Lack of success in life is typically explained by lack of motivation (the 'dole bludger') or by inadequacies among the poor or unsuccessful which may be remedied by various welfare programmes. For example, it is commonly said that people who have not succeeded in school have been unmotivated, or have had poor home or school environments. The motivation-destroying bureaucratic school environment and its lack of relevance to obtaining satisfying socially relevant work are seldom mentioned.

Alternative economic structures

There is a wide range of possible visions of society organised differently so as to provide to everyone opportunities for satisfying, socially relevant work, and a fair share of the social product[11]. Compared to present society there would be less hierarchy, more control by workers and community over decisions about work conditions and products made, and a greater diversity and autonomy of different life styles.

How to get there?

This vision is all very well, but the present reality is that most people must work in a current style job, with limited freedom and flexibility. The reality is formidable: work organisation and technology designed for control over workers, compensating concessions of consumerism and culturally approved escapes, the overwhelming influence of infrastructure, and the job and life style commitments to useless or harmful occupations. But these forces are not totally dominant. The challenge is to develop strategies and demands which link current realities to the alternative vision.

Table 1 lists some of the standard goals of the labour movement, such as higher wages. It is apparent that none of them fully faces the issues of control over production, wider social control mechanisms or the content of production. One interpretation is that the original radical goals of the labour movement were mostly diverted or coopted as the labour movement, capitalism and communism evolved in a dialectic with each other, a process during which long term goals were sacrificed for short term gains.

Table 1 a lists a typical technocratic goal, based on a necessity to adapt to technological change as introduced by elites. Views such as this overlook

Table 1. Some standard goals of the labour movement and their strengths and limitations.

Goal	Primary actors/ audience	Strengths	Limitations
Centralised economic planning using existing production apparatus	Marxist parties; working class	Promises better allocation of resources; exposes irrationalities of present economic system	Leaves open the question of the form of technology and of occupational roles; centralised planning presumably depends on expert planners who are open to cooption as part of a ruling bureaucracy; the experience of communist economies.
A larger fraction of the social product (money) diverted from profit to workers	Unions; worker oriented organisations	Promises reduced exploitation; highlights economic inequalities	No focus on the social control of production or on what products are produced; financial gains are susceptible to being rolled back by operations of corporations and governments
National expenditure shifted from corporations, military and wealthy to public sectors of health, education and welfare	General public; health, education and welfare professionals	Highlights operations of economy to serve special interests and not human needs	Ignores the critique of professionalism[12] and ignores alternative solutions based on structural change to stop the social production of ill health, ignorance and other problems such as crime and mental illness

Table 1a. A 'progressive' technocratic goal.

Creation of a new class of leisured (unemployed) people protected by guaranteed income, made possible by technology and high productivity of those few with jobs; early retirement, more formal education	Technocratic policy makers	Points out the enormous capacity of the production system and the lack of necessity for much current labour	Serves as a justification for policies increasing unemployment; benefits for the unemployed may be attacked in times of economic downturn[13]; increased stratification between technocrats, workers and 'leisured'; control over the form and content of production is left unquestioned

Table 2. Some strategies and demands centred around jobs, with strengths and limitations

Strategy/demand	Primary actors/ audience	Strengths	Limitations
Shorter work week; job sharing; option to work less for less pay	Workers (especially the well paid)	Reduces strong ties of worker to job; is the most obvious solution to unemployment that is opposed by employers	Union and privileged worker opposition to less pay for less work; lack of benefits to lower paid workers
Inverted salary structures (pay inversely proportional to the desirability of job)	Lower paid workers	Fundamental questioning of the distribution of the social product	Opposition by virtually all influential (i.e. well paid) people; conflict with established value systems
Organised action by the unemployed in social movements (e.g. squatting, workers' control, women's movement)	Unemployed and supporters	Strengthens social movements; builds experience in self help; makes unployment a threat to the establishment rather than to workers	Ease with which the unemployed are demoralised or coopted (e.g. by employment of leaders)
Those with jobs contributing part of their wages to support social activists (otherwise unemployed)	Unemployed and supporters	Strengthens social movements in a permanent manner; challenges the dominance of the individual reward system	Dominance of the individual reward system (few people would consider sacrificing part of *their* money)
Campaigns for/against technologies which lend themselves to control by/over workers (e.g. nuclear power)	Workers, community	Wide appeal of opposition on environmental and other grounds; heightened awareness of the political nature of technology; challenge to the cult of expertise	Potential for the restriction of the issue to middle class concerns such as environmental amenity[14]; cooption by establishment[15]

Table 2 (continued)

Strategy/demand	Primary actors/ audience	Strengths	Limitations
Community participation in production decision-making (e.g. worker-community exchanges of information, ideas and skills)	Workers and community	Demystification of the content of jobs; basis for greater worker-community solidarity for future worker and social issue struggles	No built in concern for alternative work or production patterns
Workers' control over production	Workers	Challenges fundamental basis of present production; demonstrates the superfluity of management; builds worker solidarity, cooperation and abilities	Attention not focussed on what is produced; wider community not involved
Socially useful production, ending planned obsolescence, etc. (e.g. Lucas Aerospace workers' campaign)	Workers, community	Points out orientation of present production to serve special interests; wide acceptability of demand; challenge to the decision-making power of employers	Attention not always focussed on who controls production
Community-based production, building of alternative economic institutions[16]	Community, unemployed	Builds and strengthens people's capacity for self-management; demonstrates lack of a need for centralised hierarchies	Isolation from wider struggles; no direct tackling of existing institutions

the immense untapped potential of humans, a potential which has been systematically suppressed by modern education, mass media, work organisation and political organisation.

Table 2 lists some strategies and demands that at least in part address deeper problems in society. There are at least three constituencies for action: workers, the officially unemployed, and the 'community' (people in their non-work roles). In the past most efforts have focussed on goals and strategies centred around workers. The items listed in Table 2 suggest some of the ways that these worker strategies may usefully be supplemented (not replaced) by campaigns involving the unemployed and the general community.

The strategies and demands in Table 2 are certainly not mutually exclusive. All of them thought to be valuable should be pursued. Furthermore, the list is far from comprehensive; hopefully it suggests some directions for consideration.

In particular, strategies and demands are needed which challenge the link between jobs (at least as presently constituted) and social worth. *Those working toward self-managed socially useful production need to propose alternative mechanisms for distributing the social product, and to develop means for transferring legitimacy to these mechanisms.*

For social activists in the jobs and technology area, there are a number of issues which can be addressed: the need for traditional jobs, the need for technologies manageable by workers and community, and the need for satisfying and socially relevant work. All of these need to be emphasised. There is a need to emphasise jobs because jobs are an important reality. But there is also a need to emphasise issues of worker and community control and of alternative means and content of production, because otherwise current job structures will be used to justify continuation of the current political and economic system.

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