

Trade unions and the democratisation of technology

JOHANN MAREE* reviews *Tools of Change: New Technology and the Democratisation of Work* by John Mathews (Pluto Press, Sydney, 1989)

Introduction: new opportunities for unions

New computer-based technology is presenting trade unions with opportunities to democratise the workplace and investment decisions as never before. This is the central message of the recent book by John Mathews, *Tools of Change*, which every serious trade unionist in South Africa should take note of.

But there is another reason why this book is of great relevance to South African trade unions. As South Africa enters the era of transformation to a new post-apartheid order, the economy is in a major crisis. With zero economic growth and no new jobs being created, more and more workers are entering the labour market, thereby pushing up high levels of unemployment to socially dangerous levels. Although estimates of

unemployment vary immensely, the President's Council estimated that in 1980 the unemployment rate was 30% (Nattrass and Ardington, pp 164-8). In some depressed areas including Port Elizabeth, it has been found to be in the order of 50% (Wilson and Ramphela, 1989, pp 88-93). There is common agreement amongst many economists, including the COSATU-linked Economic Trends Research Group, that a high rate of economic growth is needed to combat unemployment; furthermore, that this growth can only be sustained through the development of an export-oriented manufacturing sector (See the chapters by Anthony Black and Dave Kaplan in S Gelb, 1991). To achieve this, our production has to be internationally competitive both in terms of the quality and the price of products. To do so requires high

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levels of productivity and top quality production.

This is where Mathews's book comes into the picture again. In *Tools of Change* he presents ways in which trade unions can participate strategically with management in investment decisions as well as the operationalisation of new computer-based technology in the workplace. Such strategic participation, which he calls flexible accommodation, takes place without either co-optation of the union or the compromise of workers' interests.

In order to explain how this situation has come about Mathews traces two processes. Firstly, he examines the dominance and decline of Fordism and secondly, the development of new computer-based technology.

Rise and decline of Fordism

Fordism is a system of mass production of commodities along Taylorist principles accompanied by the regulation of the economy to ensure sufficient demand for the mass consumption of commodities produced under Taylorist conditions.

Taylorism, or scientific management as it is also known, is a method of work organisation developed by Frederick Winslow Taylor around the turn of the century. It is based on three essential principles.

The first principle is called the dissociation of the labour process from the skills of the workers. In the words of Taylor it means that the managers assume the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws, and formulae.

The second principle is the separation of conception from execution which means that all possible brain work should be removed from the shop and centred in the planning or laying-out department.

The third principle is managerial control of each step of the labour process. Perhaps the most prominent single element in modern scientific management is the task idea. This task specifies not only what is to be done, but how it

is to be done and the exact time allowed for doing it (Braverman, 1974, pp 112-8).

The heyday of Fordism in advanced capitalist countries was after World War Two until the late 1960s when, according to Mathews, it ran into its own limitations. Countries in the East, first Japan, then South Korea, Hong Kong, Taiwan and Singapore challenged European and American firms by becoming mass production imitators. Markets for mass consumer goods became saturated and Fordism ran up against its own technical and economic efficiency limits (pp 1,29-30). Efforts were made to try and overcome these limitations by intensifying the application of mass production principles. Firms also pursued a strategy of innovation and specialisation within a Taylorist framework, but all to no avail. A more radical alternative post-Fordist route had to be found.

Computerisation

The second process that Mathews traces is the development of new computer technology based on the astonishing processing powers of micro-electronic circuits ('microchips'). The resulting computerisation, which is the application of machine intelligence to work, has led to radical changes in the labour process. The key to these changes is the building in of processing, memory and programming capacity within tools that previously stood alone (p 41). The programmability of machines provides a flexibility to the production process and it is this flexibility that boosts productivity.

Mathews demonstrates the widespread application of the new computer technologies by examining their use in the manufacturing, services, communications and publishing industries. For the sake of brevity this review summarises almost word for word how Mathews describes the way in which Computer-Aided Manufacture (CAM) is restructuring the industry.

The common features of manufacturing machines in the Fordist era are that they are set to cut, turn or in some other way operate on a piece of material to produce an article that was previously specified in a design. The cutting, turning and other operations can be performed

by a skilled person or, as the logic of Fordist automation progresses, the machine is made to perform a pre-set sequence of operations where the worker is merely required to press a start or stop button, and supervise the operations of the machine.

With the application of microprocessors to the task of machine control, the picture changes dramatically.

Now computing power is based in the machine; programming and reprogramming can now be performed through a key board located on or near the machine. This is referred to as a Computer-Numerically Controlled (CNC) machining centre.

The essential feature that separates such machining centres off from previous forms of automation is their programmability. Whereas previous automatic tools needed to be changed when a new job was ordered, the CNC machining centre is simply reprogrammed. This is the secret of the CNC machine's flexibility which, in turn, accounts for its productivity.

An accompanying change is that CNC machines require skilled operators to ensure the high quality of the product.

The next step up from a CNC machining centre is the Flexible Manufacturing Cell (FMC) in which much of the handling of workpieces is automated. Instead of an operator having to set each piece up prior to its being machined, the FMC will allow workpieces to be fed into the machine, re-set, extracted and stored. A Flexible Manufacturing Cell thus consists of one or more CNC machines, with automated handling equipment attached.

The following step in horizontal integration is to link Flexible Manufacturing Cells by automatic transport and feeding mechanisms. Thus a chain of machining operations can be



"I want to open up better lines of communication with my employees. Plant these listening devices in all the washrooms."

linked together, all under computer control, and all subject to the programming flexibility of a single core tool. Hence this stage is called a Flexible Manufacturing System.

As a case study Mathews cites the Volvo Engine plant at Skovde in Sweden which he visited in 1988. It consists of a series of advanced Flexible

Manufacturing Systems.

Each FMS or 'line' as Volvo called it, produced an engine component, such as cylinder blocks, valves or camshafts. Machining was carried out by CNC centres linked by Automatic Guided Vehicles and Volvo-designed overhead parts handling ('gantry robots') equipment.

Each FMS is operated by a team of three or four highly skilled workers (a majority of whom were women on the day he visited the site). The multi-skilled team members are in total control: they can interrupt a programmed sequence (at any time), or reschedule operations, by typing commands into their consoles. They need never lay hands on an engine component.

The full plant is being developed by a joint management-union project group. All aspects of the work organisation and technology employed are being tested by this group before becoming embodied in plans (pp 44-50).

Mathews points out that it is not only microprocessors that are transforming the production of goods and services, but also new organisational principles that in their own way represent potential departures from Fordism. Two of the production methods he discusses are Just in Time and Total Quality Control.

Just in Time (JIT), also known as the Kanban system, is based on a strategy of inventory control. Inventories are kept to a minimum and parts are delivered 'just in time' for their

assembly. The system has its roots in employee involvement and motivation schemes as formulated in Japan. For example, on assembly line production with JIT, each Kanban worker has the right to stop the assembly line when he or she is falling behind or discovers a defective part or assembly.

Total Quality Control (TQC) which was also developed in Japan, is based on the statistical control of quality at all stages of production, from planning through to marketing. It reverses the usual notion of 'quality control' exercised by checkers and supervisors at the end of an assembly line, and instead places the emphasis on fault-free working.

These new management strategies have a post-Fordist potential which, in the view of Mathews, trade unions should build on rather than dismiss. It is, however, the flexibility brought about by programmable computer technology that gives full scope to post-Fordism and opens up great opportunities for unions.

New opportunities for unions:

1 Work Organisation

The two processes traced by Mathews - namely the organisational and efficiency limits reached by Fordism and the computerisation of work through the development of new computer-based technology - are combining to bring to an end the Fordist era and herald a new post-Fordist era of production. Mathews also argues that it provides trade unions with a unique opportunity to participate in decision-making about the investment and use of this new technology.

Workers and their unions now face the challenge of developing a new strategy of intervention, oriented towards a broad conception of a future economy and social system. Meeting the challenge will require members of unions to revise radically, their attitudes to questions of technology, work organisation, skills formation and industrial relations (p 2).

The three broad areas of work organisation, skills formation and industrial relations are closely interrelated as changes in

work organisation have immediate implications in the other two areas. In the area of work organisation efforts were already made as early as the 1920s and 1930s to offset the dehumanising effects of Taylorism. The Human Relations School emerged around that time in the USA, but its effects on work organisation were mainly cosmetic. A different response to Taylorism was the Sociotechnical School that emerged in Britain in the 1950s. It developed and popularised the notion of semi-autonomous work groups and showed that such work reorganisation even enhanced productivity.

In the 1960s and 1970s the Quality of Work Life (QWL) initiatives emerged. Its initiatives included such measures as job rotation (the planned rotation of a worker through a number of tasks, all of comparable challenge and requiring comparable skills), job enlargement (an increase in the number of tasks performed by the worker) and job enrichment (the grouping of tasks of different quality into a single job). Additional initiatives were the relaxation of work rules as well as the introduction of group and team work. Important as these initiatives were in the 1970s, they remained for the large part bound within a framework of ameliorating the excesses of Taylorist work organisation. They were not motivated by the need to reorganise production in order to take advantage of the potential unleashed by computerisation (Mathews, p 105).

It was only in the 1980s that post-Fordist work organisation, designed to optimise the flexibility achievable with programmable computerised systems, came to the fore. Such alternatives have become realities in West Germany, Scandinavia and Japan. The characteristics of the new production methods are firstly that they are 'human centred' in that they perceive labour not as a cost that is to be minimised, but as a resource whose potential is to be maximised. They are also based on flexible specialisation which is a strategy of permanent innovation based on flexible, multi-use, equipment and skilled workers. The outcome of such functional flexibility is the production of many different

products of high quality based on innovation. These characteristics of post-Fordist production methods require the following principles of post-Fordist work organisation:

- horizontal and vertical integration of tasks;
- broad levels of responsibility and multi-skilling;
- group work or team work;
- decentralisation of decision-making through worker-involvement; and
- shared supervision.

The principles are fundamentally in opposition to Fordist work organisation principles. An example by Mathews of the Volvo Engine plant at Skovde, Sweden best illustrates this.

In the final engine assembly area teams of nine to ten workers will follow an engine through from initial assembly of components, to final testing of the completed engine. Tasks will be performed at different work stations, while the engines-in-transit will carry all the components needed for assembly in 'supermarket' baskets attached to Automatic Guided Vehicles. A member of the team will test the engine in an area insulated from the assembly room, and will be able to make adjustments on the spot at a specially designated rectification work station. This is a long way, conceptually and organisationally, from Henry Ford's assembly line.

Note how this innovative system of job and work design meets all the criteria we have identified as defining post-Fordist work organisation:

- The assembly process is completely integrated, with team members being responsible for an assembly job from start to final approval.
- The team members have broad levels of responsibility, and exercise considerable discretion in the fulfilment of their duties, for which they are highly trained.
- All work is team-based, with the team being responsible for allocating tasks amongst its own members.
- Co-ordination of tasks is exercised internally, within the team, rather than by an overall plant manager. No intermediary management levels get in the way" (pp 114-5).

2 Skills Formation

Post-Fordist work organisation has major implications for both management and trade unions in the areas of skills formation and industrial relations. With regard to skills formation Mathews argues that trade unions, especially craft unions locked in a Fordist paradigm, will have to change their static approach to skill acquisition by workers. Traditional craft unions have assumed that a skill is exclusively and completely attained through apprenticeship. Skill is thus regarded as a 'once-off' acquisition. The unions then organise such skilled workers and do not allow non-apprenticed workers into the skilled job categories.

The essential feature of post-Fordist skills formation is continuous skill enhancement. This makes it compatible with the flexibility required of programmable computer systems. It implies a system of skills formation suitable to broad-based job categories rather than jobs defined in narrow terms of machines to be minded. It also allows for career progression by having a skill formation ladder. This is a job category structure that allows workers to move from one skill band to another, as they complete further training and acquire experience. It is this aspect of skill formation that represents the most radical break with Fordism and its Taylorist work organisation. Another move away from Taylorism is skill broadbanding which is the process of reintegrating fragmented jobs into more broadly based job descriptions.

A more flexible system is one that has multi-level entry which means a system of training (skills acquisition) that can accept people at different ages and with different backgrounds. Multi-level exit means a training system that can allow people to leave at different points with qualifications in ascending order of importance. Yet higher levels of skill formation are multiskilling and group skilling. Multiskilling refers to a worker being able to perform more than one skilled task while group skilling extends the notion of multiskilling to the level of a group of workers, so that the group encompasses a range of skills within itself.

Post-Fordist skills formation also requires training as part of the job. In the leading industrial nations of Japan, West Germany and Scandinavia, according to Mathews, firms provide training to employees and seek to retain them by offering a career path, with appropriate wage structures, within the firm.

As a case study of a comprehensive skills restructuring agreement Mathews, cites the agreement covering the metal and engineering industry in Australia. The union there, the Amalgamated Metal Workers Union, negotiated a new agreement based on the principles of multiskilling, skill broadbanding, and creation of a career path. A set of broadbanded job categories, only seven in all, was proposed to replace the 300 categories in the previous agreement. Dynamic progression from one category to another was also provided for. The agreement removed the long-standing barrier between 'skilled' and 'unskilled' workers. This major initiative, according to Mathews, will revolutionise the capacity of the metals manufacturing industry to restructure and face the future.

The approach of post-Fordism to skills formation has major implications for South Africa. Firstly, it can help black and women workers who have been disadvantaged, either through racial or gender discrimination at work or through receiving an inferior or even no education. Under post-Fordism they can advance by receiving on the job training that allows them to advance to jobs requiring higher skill levels. It can thus help to put an end to traditional racial and gender job barriers in South Africa.

Secondly, it can assist unions that are striving to restructure South African industries. The flexibility that accompanies post-Fordism grants employers and unions space to negotiate over a range of issues relevant to restructuring. There is, for instance, a great deal of overlap between the proposals put forward by Mathews in his book and the issues discussed at the NUMSA reconstruction workshop late last year (See Karl von Holdt, 'Toward Transforming SA Industry: a reconstruction accord between

unions and the ANC?', *Labour Bulletin*, Vol 15, No 6, March 1991, pp 17-25).

Mathews sees the task of developing a post-Fordist pattern of skills formation as a political challenge in that it will require substantial breakthroughs in the area of industrial relations.

3 Industrial Relations

The Fordist approach to industrial relations is essentially an antagonistic one based on the mutual recognition by employers and unions of each other's different spheres of interests. Unions thus recognise spheres of managerial prerogative whereas employers recognise certain areas where the union can limit managerial prerogative. The limitation could for instance be in the implementation of procedures such as grievance procedures, or could deal with the negotiation of wages and working conditions.

According to Mathews the first substantial departure from Fordist industrial relations came in the 1970s and 1980s when the unions concentrated on specific issues such as the protection of workers' health and safety. This had the effect of challenging and rolling back the claims of 'managerial prerogative' issue by issue.

Mathews, however, makes it clear that to achieve post-Fordist democratisation of the workplace, a substantially different approach to industrial relations is needed.

A post-Fordist model of industrial relations needs to be based on the mutual advantages that both labour and capital derive from a productive and efficient enterprise that is grounded in respect for human skill and ingenuity. It abandons a model of adversarial relations in favour of co-operation, within an agreed framework (p 146).

This approach is termed flexible accommodation by Mathews. He maintains that the advantage to unions is that it leads to a strengthening of unions rather than a weakening and that there is considerable evidence from many countries that this is the case. The advantage to employers is that this approach improves the enterprises' cost effectiveness and productivity. Flexible

accommodation thus holds mutual gains for both parties.

Mathews is aware that many trade unions are wedded to the idea that worker militancy must always be expressed in the form of disagreements with the bosses. As a result the idea that collective strength can be exercised through an agreed structure of co-operation is difficult to grasp. What may make it easier for unions is to realise that Mathews is talking about participation leading to co-determination. This means that Mathews has in mind a system that gives the unions equal power to management so that unions co-determine the outcome of decisions.

There is one important aspect of co-operation that Mathews does not cover adequately. That is the question of financial disclosure and financial participation. When workers are faced with new technological systems that are designed to boost productivity, they are legitimately concerned that the gains made from the increased productivity will not only go into greater company profits and greater benefits for employers. To ensure that the workers gain their fair share from the increased productivity as a result of investment in new technology, the enterprise has to provide the union with full disclosure of all the relevant financial information. The union can then ensure through bargaining that workers receive their fair share for their co-operation in achieving an increased productivity.

Principles of post-Fordist industrial relations put forward by Mathews include the following:

- support for technological change - on the basis of job security, full disclosure of plans and information, and full consultation over the process of change;
- support for new forms of work organisation - on the basis of a broadened agenda for negotiation and co-determination structures;
- support for multiskilling and group skilling - on the basis of an agreed career path structure and the provision of lifelong training;
- a wage system linked with skill and group

remuneration.

Two fundamental prerequisites must be satisfied before a union can be expected to co-operate in the introduction of new technology. These are that jobs overall be protected with new skills taking over from old skills via retraining; and that any change should be subject to extensive and lengthy consultation.

The post-Fordist wage system, says Mathews, should aim to minimise the potential for demarcation disputes as well as link productivity, training and skill formation. It should thus remunerate the acquisition skill, but also allow for group-based rather than individual remuneration. While all members of teams need not receive the same wage, there does need to be a common element that reflects the team's group effort.

By consultation Mathews in fact means a process in which the union first arrives at an independent position about the new technology. It does so by obtaining full disclosure from employers of their intended plans as well as conducting its own research on the topic. To do so, the union may have to call on the services of experts outside the union, but it is essential that these experts remain fully accountable to the union and consult all the appropriate union structures. Only once the union has arrived at its own position does it enter into consultation with employers. As Mathews stresses:

"A genuine co-operative relationship between parties is one built on equality of resources; otherwise it becomes a dominating relationship. The only basis on which unions will be able to hold employers to a co-operative strategy, is by making an independent and technically sound contribution of their own" (p 166).

Dangers and opportunities: the way forward

The above outline of Mathews's arguments have stressed only the positive potential that he sees in post-Fordism. But he also sees danger signs which he warns unions to guard against.

The first danger that he warns against is that flexible specialisation brought about by

programmable computers could be based on a small core of skilled workers with job security combined with a large periphery of unskilled workers without job security. The unskilled workers can easily be dismissed during a downturn in trade or slump in the economy and hence it is very important for the unions to negotiate as much job security and social benefits as possible for the 'peripheral' workers.

The second danger that Mathews warns against is the anti-union strategy coming from the New Right. In essence their strategy is to by-pass the unions by creating an elite core of skilled workers and excluding the unions from meaningful negotiations. The more antagonistic the union is, the easier it will be for the New Right to adopt its preferred strategy. Although there is evidence that progressive post-Fordist strategies are being implemented, Mathews warns that they are still 'straws in the wind' that could be 'blown away by adamant obstruction on the part of backward-looking trade unions' (p 37).

Instead of 'adamant obstruction' Mathews recommends that the unions block the tactics of the New Right by offering employers a constructive alternative. The alternative, a human-centred work organisation in industry, is to be based on the newly found link between flexibility, productivity and democratisation which is the material basis for a new compact between capital and labour.

However, Mathews also sees the programme of transition from a Fordist to a post-Fordist workplace as a political program. This, he argues, is because issues at the workplace are integrated with broader issues at the levels of the firm, industry, economy and even the state. Because of this integration, employers and unions on their own cannot achieve the transition, but need to broaden the compact to include other significant parties as well.

Unions and employers on their own, even in the best of all possible partnerships, cannot change the industrial system. The role of governments and social movements, professional groupings and other

'associations' will also be critical. A framework of goals is needed to tie these disparate interests into a coherent force and orient them towards a common goal (p 184).

Mathews does not explain well enough in *Tools of Change* why social movements and the state are necessary to effect a transition to a highly productive post-Fordist economy. In another book by him, *Age of Democracy*, he goes more deeply into the matter. He maintains that the trade union movement should set itself social goals and negotiate 'social contracts' with social democratic political parties to achieve the goals. The state should support and co-ordinate the process of change rather than 'deliver' the social transformation (See Eddie Webster's review of *Age of Democracy* in *Labour Bulletin*, Vol 15, No 7, April 1991, pp 79-83).

In South Africa, facing a major economic crisis outlined at the start of this review, a social contract is urgently needed between all the major economic actors - be they trade unions, employers' associations, social movements, political parties, the government or the state - based on the common goals of achieving a high economic growth rate, combating unemployment and uprooting poverty. Because of the interrelatedness of economic, political and social issues in South Africa, it is necessary that all economic actors with sufficient power either to disrupt or to deliver the social contract should participate in drawing up the contract. Although the transition to a highly productive post-Fordist production system will only be one component of such a social contract, it will nonetheless be vital in reconstructing the South African economy. ☆

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