

AUTOMATION: control of worker and machine

THIS article is an attempt to focus attention on changes occurring in the labour process (the manner in which machines and people combine to produce items) due to the 'third technological revolution'¹, which is characterised by the control of machines and industrial processes by means of electronic apparatuses. The third technological revolution is the change from mechanised production to automated production, and represents the culmination of the metamorphoses of the means of production.² It is also referred to as the electronics revolution.

Three aspects of this revolution in the means of production will be considered:
The effect on labour;
Trends in South Africa;
Examples.

a) The effects on labour:

Automation of production is seen by the originator of cybernetics, Norbert Wiener, as a great liberating force, in that 'it gives the human race a new and most effective collection of mechanical slaves to perform its labours'.³ However, technological advances only have a liberating effect if they free human labour from degrading and

dangerous occupations. If labour is forced to compete with the mechanical slaves created by advancing technology then it is also forced to accept the conditions of slave labour.

The industrial revolution, by introducing mechanisation, devalued the strength of human labour - no human could compete against steam or electric power. Many crafts survived and skilled artisans like carpenters, mechanics, etc, were initially not threatened because their skills were mental skills to a large extent.

With the advance of technology and increasingly through the use of automated machinery, it is not only the strength of living labour that is being devalued but also the mental skills. A skilled fitter and turner can be replaced by a numerically controlled machine (to quote a machine-tool supplier: 'Wherever you go people are wanting to replace older machines with more automated machinery so they can cut down the ever-increasing problem of labour' - see Times in Industry, supplement to the Sunday Times, March 30, 1980). Office routines are computerised and skilled clerks become slaves to a machine. The survivors of each technological revolution become fewer and fewer and the remaining employment opportunities requiring an understanding of the production process is reserved for an ever-decreasing technological and managerial elite.

In 1965, at the First National Conference on Automation and Computation, the Senior Vice-President of TUCSA, Tom Murray, said '... the implications of cybernation are causing little or no concern to the

average South African worker. Indeed, the overwhelming majority of the workers, the unskilled non-White labour force, are quite unaware of the evolution of machines that will, within a matter of decades, eliminate them from the workplace'. This echoes the concern expressed by Wiener.³ He found that at the level of shop steward the trade union officials often did not have the broad training needed to enter into the larger political, technical, sociological and economic questions raised by the progress of automation.

The editorial of South African Labour Bulletin of November, 1978 (4,7) mentions two aspects of changes in the labour process brought about by technological progress: deskilling of occupations, and reduction in the size of the work force. Three studies examining trends in a general engineering firm, a dairy and the furniture industry are published in the same issue. The conclusion drawn is that:

The forces that erode skills are too powerful for organisations on a craft and race basis to provide lasting protection of existing skills and privileges. The real issues at stake for the trade unions is to be strong enough to be able to bargain and exert a degree of control over the whole labour process so as to try and benefit all workers.

To this may be added that future generations of workers should not be forgotten.

While it is important to be aware of the deskilling process brought about by increasing mechanisation and automation, it is not the skilled worker who will lose most. Due to the increasing concentration of production necessitated by more capital

intensive production, the economic base in rural areas and small communities will deteriorate. The people who stand to lose most are the young, the undereducated, the unskilled workers, the laid-off workers with outmoded skills and the unemployed in those areas where economic stagnation has resulted.

Employment requirements for automation in South Africa were predicted in 1969 by GA Harvey. According to him the requirements would be:

3 530 graduates (engineers)
6 730 technicians
3 650 non-matriculants

in the period 1968-73.

The expected shortfall for non-matriculants was 364, 5 410 for technicians and 2 250 for graduate engineers. This shows the expected trend as automation is increased, ie more skilled labour is required, and explains the continual demand for skilled labour by industry. This trend does not change as industrialisation progresses and in the EEC countries the rate of change of employment in the period 1969-73 had decreased to 0,72 while the rate of change in output was 5,39. This means that fewer people are required in production, but that at the same time more is being produced.

Linking this trend to the employment requirements listed above indicates that as automation is introduced the demand will be for skilled labour, but the skills required will be those needed to service and maintain the ever more complex machines. The skilled artisan who was in the frontline of production will be replaced by an automated production process under the control of an unskilled machine operator. Employment opportunities

will also show a relative decline as productivity is increased.

Often the skills required will be new skills making skills acquired previously obsolete.

b) Trends in South Africa:
In order to compete on international markets and to attract investment capital, South African industries must manufacture according to international standards and at costs competitive with those of the advanced capitalist countries. To meet these requirements the local manufacturing techniques must be in line with those of the advanced countries.

Modern manufacturing techniques are increasingly being automated, the reasons for this being:

- i. To increase the control of management over the production process, and, therefore, over labour;
- ii. To eliminate the human element in manufacturing.

Increased control means better planning and the elimination of time-wasting and unproductive procedures.

By eliminating the human element in production higher and more consistent standards can be maintained. In short production runs the costly retaining of labour is eliminated.

Clearly modern industry is capital intensive and not labour intensive. For South African industry the drive to modernise appears to be a contradiction due to the large scale unemployment and availability of a cheap labour supply. The South African industrialist would hesitate before

modernising, as a labour-saving machine is only used if its cost is offset by the saving in labour costs and the increased productivity due to its use.

The South African state regards international trade links as strategically important and would encourage an increasing integration into international trade - this requires modernisation of South African industries. The Wiehahn and Riekert Commissions represent some responses by the state. In particular the creation of the National Manpower Commission (NMC) can be seen in this light. Its principal functions will be:⁶

- i. to analyse the overall manpower situation by research into the design, planning and modernisation of manpower programmes;
- ii. to keep a close watch on developments on the international labour front;
- iii. continually to evaluate the application and effectiveness of labour legislation and practice.

In general the recommendations of the Commissions will have the following effects:

- i. create a stable urban labour force which will be in a privileged position relative to migrant labour;
- ii. encourage the training of labour to meet the demands of modernisation. For this to be viable a stable labour force is necessary. This would mean higher pay for those included in the overall plan, but productivity would be higher;
- iii. removal of the unemployed and under-employed from urban areas.

The state's response is to co-opt a section of the black labour force by sharing

the prosperity generated by increased productivity with them.

c) Examples:

Three main areas of automation can be identified:⁴

i. Electronic Data Processing (EDP)

In this area electronic computers are used for processing of information in the insurance, banking and other mainly clerical branches of occupation. Many clerical and secretarial functions, even in smaller businesses, are being taken over by mini-computers or electronically controlled machines.

The main benefit to management does not derive from automation of routine clerical duties but from the information processing capabilities of electronic computers. EDP provides management with a source of information enabling them to exercise greater control over their organisations, increasing efficiency and productivity.

ii. Process Control

This is used in direct control of the production process in industries like - petro-chemical (the most advanced application); pulp and paper industry - these have been increasingly automated and the expected expenditure on automation over the five years 1969-73 was R16,15-m; ore retrieval in mining, steel rolling mills and the metallurgical industries.

iii. Advanced mechanisation or small scale automation

In this field automation is being introduced into sectors which traditionally have been labour intensive.

Such industries are ones in which batch production has dominated over flow line production. Productivity has been low because of poor machine utilization. Two examples are the metalworking industry and the garment industry.

In metalworking numerically controlled machines are replacing skills held by skilled machine operators. The latest generation of these machines are extremely flexible and use micro-computers to control operations. These machines are less expensive today than their predecessors of ten years ago and are suited to batch production because of the greater flexibility inherent in computer control.

The clothing industry is characterised by low capital costs and high labour intensity. Changing fashions and the complexity of production have precluded the design of purpose built machines. The micro electronics revolution is changing this and self programming robot arms are being produced for use in cutting. Layout of patterns on the cloth to minimise wastage has been computerised (eg at the Edger's factory at Tonoset). In fact a visit to a multinational owned factory (eg Hang Ten) will show that in the garment industry the competitive edge is no longer labour costs but technology employed.

The introduction of automated production and control processes is based on the electronics revolution. Labour is not only affected in industries which are being automated but also in industries producing equipment for automation. A striking example is the manufacture of electronic

telephone exchanges. In the UK in changing over from electro-mechanical to electronic exchanges over 90% of the work force employed on the production of electro-mechanical exchanges was made redundant.

Wherever electronic circuits are used in equipment they are designed for ease of maintenance and repair. So-called skilled electronics 'engineers' or 'technicians' are often people with no more than a month or two's training. Their skills consist of using diagnostic aids to trace a possible fault to a particular sub-module (unit) which is replaced. The faulty module is either repaired by a small workshop staff, or else thrown away as scrap. A typical example of this is the television receiver repair business. This does mean that a country can use high technology techniques without ever building up the basic skills, and this leads to greater dependency on sources of these skills like multinational companies and expatriates.

Another example of skills being devalued through the use of electronic circuitry is in the watchmaking industry, or in South Africa, the watch repair industry. Digital electronic watches should last a lifetime with only periodic battery replacements required. Repairs are not worth the cost due to the ever decreasing prices. Watch *repairers could therefore be of ever less relevance.*

Further examples of automated production are briefly listed:

- computerised electronic weighing at SA Titan Products. 'This will not be an operatorless plant... It cuts down on the amount

of operator skill required to ensure smooth and efficient operation' (Pulse, August 1974).

- supervising control system at East Driefontein gold mine reduction plant. Computers accomplish the tasks of plant state sensing, status display, switching motors and providing the operator with access to the plant (Pulse magazine, December, 1974).
- control of a hot strip mill at ISCOR (Pulse, December, 1974).
- quarrying. Morigrove quarry in Port Elizabeth where computer controlled weigh-bridge is used to control invoicing and stores records as well as keeping a record of the truck fleets.

Conclusion:

The main aim of this article is to create an awareness of the implications of the electronics revolution.

Trade unions in South Africa should familiarise themselves with production trends in industries in the advanced countries as well as the response of trade unions in those countries to such changes.

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References:

- 1) E Mandel: Late Capital (Verso, 1978) page 120.
- 2) K Marx: Grundrisse (Penguin, 1973) page 692.
- 3) N Wiener: Cybernetics (MIT Press, 1961).
- 4) GA Harvey: 'Skilled Manpower Survey for Automation in South Africa' (Third National Conference SACAC, 1969).
- 5) S Jacobson: 'Microelectronics and the Third World' (Wireless World, March 1980).
- 6) South African Labour Bulletin, volume 5, numbers 2 & 4.

THE NATURE OF POLITICAL TRIALS

DO 'political trials' take place in the courts of South Africa? State prosecutors deny it vehemently, claiming that trials involving people charged under 'security legislation' are criminal matters; government ministers have objected to the category 'political prisoners' being applied to people convicted in such trials, and at least one Supreme Court judge threatened to report an advocate to his Bar Council for referring to a trial as 'political'.

Yet a strong case can be made that, at very least, trials held under 'security' legislation (especially the Terrorism Act, Internal Security Act and 'Sabotage' Act) do have features which distinguish them from more conventional 'criminal' trials, eg. murder, theft, fraud and so on. A number of these features spring to mind fairly readily:

1. In the vast majority of 'security' trials, accused persons are held in police detention for lengthy periods of time prior to being charged and appearing in court. Provision for such detention is made in, inter alia, the General Laws Amendment Act of 1966 (14 days), the 180 detention clause, and section 6 of the Terrorism Act, which allows for indefinite

detention under virtually limitless police control of detention conditions.

Accordingly, accused persons in 'security trials' have usually been in police custody for a long time - often the whole duration of the investigation against them - before appearing in court. In criminal matters, evidence is usually gathered against a person prior to his or her arrest; on arrest, the accused is usually charged within 48 hours and even if not granted bail has access to friends, family and legal advisors.

In a situation of lengthy detention and interrogation, an accused person is under strong compulsion to assist the police in gathering evidence against him or her, as well as against others who may eventually be charged in court, or used as witnesses.

2. The next major feature distinguishing 'security' from 'criminal' trials is the question of evidence led in court against an accused. In almost all security cases, alleged accomplices of the accused are detained for lengthy periods, and placed in a position of helping the police to build up a case against the accused (a person may be detained until he or she has answered all questions to the satisfaction of the police). Once the accused has been charged, and it has been decided to use accomplices as witnesses, those accomplices may be, and usually are, held in custody on order of the attorney general. When such a witness is brought to court to give evidence against the accused, he or she arrives in court