

# TRENDS IN MANUFACTURING ORGANISATION, PLANNING AND CONTROL

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The theme of this talk is the Government's policy towards Information Technology, or IT for short, and what the Government is doing to promote the use and application of IT in all sectors of our society. But first, what is IT?

A recent poll on IT showed that 85% of those asked knew nothing about information technology, yet 54% of the same sample said that IT was essential for our future industrial growth, the most important thing in the country.

Traditionally communication came in two distinct forms - the written word and the spoken word through the telephone, radio and television. Today's technology breaks down this distinction and new types of communication are emerging. It is these new developments which have been given the name 'telematique' in France, and the somewhat cumbersome term in America of 'communications'. In Britain we call it Information Technology.

The accepted definition of IT is 'the use of computer, microelectronics and telecommunications to help us produce, store, obtain and show information in the form of pictures, words or numbers.'

The Government's strategy towards Information Technology can be broken down into three areas. Firstly, the dissemination of new technology through the economy is a critical factor in determining its overall competitiveness. Slow diffusion relative to competitor countries means lost markets generally at home and abroad, missed opportunities for new business and employment creation, and failure to make productivity gains. It also means lost markets for the UK supplying industry and slower product development compared with our competitors.

Acceleration of the diffusion rate of the new technology through the economy is thus a critical factor for the economy generally, and for the supplying industry in particular: it is a key objective in the Government's strategy.

Secondly, the Government provides direct support to increase the efficiency and technological performance of UK industry, in order to achieve an internationally competitive supply industry. Ultimately, this is a task which industry must perform by itself. The role of Government in this area is therefore essentially catalytic, acting principally through the channels of direct R & D support and public purchasing policy.

Thirdly, the Government is

responsible for setting the infrastructure and domestic environment in which the IT industries can achieve growth, principally through telecommunications and broadcasting policies, data protection and national standards. To meet these three objectives the Government has established a positive programme of action aimed at increasing the diffusion of the new technology and strengthening the position of the UK industry.

I will deal with each of those three in greater detail.

### Dissemination and Awareness

A principle cause of slow diffusion is lack of awareness of the technologies and opportunities that are available. The Government therefore took the initiative by establishing a series of co-ordinated awareness campaigns which has been brought to a focus during 1982 as a result of this year being designated Information Technology Year. IT Year is a partnership between Government and industry and commerce who, during the year, have each staged open days, seminars, conferences etc., with Information Technology as the main theme. The press have been encouraged to cover IT applications and innovation and there has been a continuous dialogue with companies in order to incorporate the IT '82 theme into their promotional programmes and newsletters.

Six mobile exhibition units have been touring the country demonstrating various aspects of the office of the future. The culmination of the year will be the major international conference, to be opened by the Prime Minister on 8 December at the Barbican Centre in London.

### Financial Support

The Government has made special arrangements within its general Support for Innovation to promote the application of important new technologies which are essential if UK manufacturing industry is to remain competitive. Within the general arrangements for supporting R & D projects there are a number of special programmes aimed at microelectronics, robotics and flexible manufacturing systems.

One of these, the *Microprocessor Applications Project* is aimed at encouraging UK companies to use microelectronics in their products and processes.

It was launched in 1978 with a £55m

budget allocated to the three areas of awareness/training, consultancy and project support. A further allocation of £30m was recently announced. So far expenditure of over £45m out of the budget has either been committed or is under active consideration.

- almost 160,000 people have attended workshops, seminars etc., under the awareness programme.

- over 34,000 extra training places on short term courses have been created.

- 2,700 feasibility studies have been carried out.

- support has been offered for some 700 new microprocessor development projects.

However, a great deal still remains to be done, and three new initiatives are under way. First of all a series of case studies is being published, called "Microelectronics at Work", showing how individual companies have successfully used microelectronics to improve their performance, with assistance from MAP.

Secondly, a series of sectoral campaigns is being undertaken to reach industry via its trade and research associations. The third effort is to enlist local organisations to develop awareness activities on a regional basis.

In advanced production technology there has been an encouraging response to our schemes of assistance. For robotics we have offered grants totalling almost £4M to support 95 installation projects (involving almost 100 robots), 18 manufacturing projects and 37 consultancy studies. A further 45 applications are under consideration. At the end of 1980 the UK robot population was 371. It is now estimated to be around 1,000.

The £35M Flexible Manufacturing Systems Scheme was only announced in June but has already given rise to over 1040 initial enquiries. Twenty-two applications are currently being considered and discussions are under way with several other companies.

The Government have introduced a number of other direct support schemes for various information technologies.

The Department of Industry is promoting the application of computer aided techniques for design, manufacture and test in the electronics sector (CADMAT) and for design and manufacture (CADCAM) in the mechanical and electrical sectors and those other sectors manufacturing discrete products, through awareness programmes. Initial interest is being stimulated through a series of regional

seminars for managing directors. We are providing facilities for potential users to have some free "hand-on" experience of the techniques and have arranged with a number of firms already using the technology to demonstrate their application to others. Free consultancy and an information service are also offered.

Companies not already using the technology can also be assisted to acquire the necessary computer hardware and software through a grant of 1/3 of the cost up to a maximum grant of £60,000.

The *fibre optics scheme* is a £25M 5-year programme to assist the fibre-optics and opto-electronic industries. The objectives are to build up industrial capacity able to meet the needs of equipment companies and end users for optical fibre systems components; and to build up UK industrial competence in opto-electronic techniques and to produce a wider range of component products, with particular emphasis on critical components for novel systems.

The *Microelectronics Industry Support Programme* (MLSP) is aimed at helping to create a capability for the development, design and manufacture of the custom and industry-specific microchips that will be needed by user industries; encouraging the production of standard integrated circuits in the UK; and supporting companies supplying equipment, materials and services for the manufacture of silicon integrated circuits to the infrastructure industry.

The *objective of the Software Products scheme* is to encourage the development and marketing of innovative software products. Any proposal is welcomed from the UK computing services industry, however those which contain an element of technical innovation will be particularly welcome.

There is no limit on the type of innovative software which can be proposed but the software should be an identifiable product with a defined end market. Major hardware developments are outside the scope of the Scheme although any necessary hardware developments, such as a terminal interface, may be included if they are a small proportion of the work. Usually a full proposal covers development and marketing activities. The scheme can cover marketing costs during the development period and continue for two years after the launch.

While the emphasis in Departmental support for IT has been on hardware and software, services made possible by the use of IT are not neglected. Dialtech helps UK industrial users with suitable terminals to interrogate the European Space Agency computerised

information files at Frascati in Italy. Over 21 million references to technical articles in many subject areas can be searched in a few minutes.

A UK organisation planning to set up a database as an information service can qualify for DOI financial support in the launching phase.

In order to encourage the application of information technology in important sections of the community, such as health and education, the Government has introduced a number of schemes aimed specifically at accelerating the take up of the technology in these sections. It has also introduced similar schemes in particular sectors of business such as the office and for small firms.

The Department is working closely with the Central Computer and Telecommunications Agency and other public sector bodies to carry through a wide ranging strategy for promoting office automation. This strategy includes the mounting of eight to twelve "Office of the future" pilot projects and has progressed well since it was first announced last year. A number of trials have already been announced; further announcements will be made by Ministers in the coming months.

The "Micros for GP's" scheme is a pilot initiative launched jointly by the DoI and the Department of Health and Social Security to explore how microcomputer systems can be used in general practices for the benefit of patients, doctors and the Health Service. About 150 practices will take part in the pilot scheme and the DoI will pay half of the cost of the hardware and software and all the costs of planning, delivery, installations, training and maintenance for three years.

The Department's Industry/Education Unit is currently operating the "Micros in Schools" Scheme, which gives 50% of the cost of a microcomputer package to all Secondary Schools. The scheme will end in December; it has proved highly successful since it was launched by the Prime Minister last year, and about 85% of Secondary schools have taken advantage of the Scheme. We believe that almost every secondary school now has at least one microcomputer, and most schools have a number of them. The Scheme has now been extended to include all primary schools, again offering pound-for-pound support for a microcomputer pack. The equipment and the colour monitor have been selected on grounds of educational and technical merit and value for money, and all are British. The two schemes together will cost an estimated £12M. They have opened the educational market for computing equipment, including peripherals, and for software.

A national network of IT centres is being established in towns and cities

around the UK as a joint initiative between the Department of Industry and the Manpower Services Commission. The centres will give unemployed young people training and work experience in micro-electronics and computing skills and will be closely linked with high technology companies.

The locations of the first thirty centres were announced in December 1981: as a result of the excellent response received to date from potential sponsors, it is intended to increase this number to about 100 by the end of 1982.

The simplest form of IT that you can see in every high street is Teletext/Viewdata. Government has served as a focal point for industry to initiate increased marketing activity for *teletext and viewdata*, as well as helping to develop a teletext promotional campaign, aimed at the consumer. A National Teletext Month took place in October 1982, with industry taking the lead and with Government playing a co-ordinating role. Government has also helped by providing 5 million consumer leaflets explaining in simple terms the teletext and viewdata services; by producing and distributing a bi-monthly newsletter to industry to assist in communication between and within the various sectors of the industry and the retail and rental trades, and by sponsoring programmes of training and education for the rental and retail trades.

Following the highly successful second Teletext and Viewdata Commitment Conference held in February 1982, the various sectors of the industry committed to turn their attention to promoting mass market viewdata. A major initiative has therefore been launched beginning in October 1982 with the building up of a test market covering 2,500 viewdata sets being placed in the West Midlands. It is intended that the viewdata service would cover not only information but also elements of telebanking, teleshopping etc. Full cooperation is assured by the rental and retail trades, the set manufacturers, British Telecom, the information providers and a good cross section of services and goods provided, with the entire test market package being run by Viewtel 202, the leading information provider on Prestel.

In the 5-year period up to and including 1980, 100,000 homes in the UK had acquired teletext. In 1982, as a result of the National Teletext Campaign, a further 200,000 homes acquired sets to receive this service, and we expect at least a further 500,000 to acquire sets this year. About 90% of teletext sets have been made in the UK, with 100% of the components UK-made. In other words nearly 1 million households should have a teletext set,

not to mention all these with home computers – and of course games.

The *Federation of Microsystems Centres* was announced in November 1981 after the successful trial of a pilot centre at the National Computing Centre's London Office. The Federation is co-ordinated and monitored by NCC on behalf of DoI. The purpose of the Centres is to give impartial advice on the selection of microcomputer systems to the small businessman and to help him understand use the systems when installed. Most of the Centres will be based at Polytechnics where there is considerable experience amongst the staff. Apart from NCC Microsystems Centre, there are ten others currently operating, including one in Sheffield and another here in Leeds. Four more are due to open shortly.

There are 3 areas of the strategy (1) Awareness (2) Support now (3) the infrastructure.

The Government aims to promote consumer choice in telecommunications and to ensure that industrial and commercial decisions affecting telecommunications are determined by the market and not by state monopolies. The Government believes that a combination of consumer choice and the disciplines of the market will lead to more stable prices, improved efficiency and higher quality of service.

The British Telecommunications Act 1981 has paved the way for a choice of telecommunications networks (Mercury has been licensed and will start to provide services in competition with BT early in 1983), a choice of telecommunication services (all network except simple re-sale and international services under a general licence) and a choice of apparatus (by July 1983 the private sector will be able to compete with BT to supply all kinds of subscriber's apparatus except the first telephone on each exchange line and certain types of call routing apparatus – some equipment is already open to competitive supply). The Government has already sold half of Cable and Wireless to the private sector and has announced plans to sell half of BT itself, which will ensure that investment decisions in telecommunications will depend on market disciplines and not Government policies.

The Government has maintained a concentration on the communications sector and has enabled British companies to establish a leading position in the space field within Europe. British Aerospace has been the prime contractor for all ESA's communications satellites, including most recently the L-SAT large multi-payload communications satellite programme which was announced in

November 1981 at the start of IT Year. The industry currently has on hand orders for 9 satellites, with firm prospects for gaining more before the end of this year; it also has a substantial share of the contract to build 5 satellites for the international telecommunications organisation INTELSAT.

The use of satellites for wideband telecommunications is well established and the commercial market is developing rapidly, both for satellites and the services they can provide. The Department of Industry is also funding R & D in the new space application of remote sensing, that is obtaining information about the earth's geology, weather, land use etc., from observation satellites. Major advances in both hardware and software have been required to obtain, collate and interpret information gained from these techniques.

The Government's policies of liberating communications have also benefitted the space industry by stimulating the market for satellite services. Mercury has announced its intention to utilise satellite links and many of British Telecom's charges for international calls have been reduced. In March this year, the Home Secretary announced approval for two channels of direct TV broadcasting by satellite and a consortium of companies is now finalising the details of £150 million private venture investment proposal to provide a satellite broadcasting capability.

#### Cable Systems

The report on Cable Systems published last March urged that the Government should encourage an early expansion of cable systems. While the Government does not endorse everything in the report, it is concerned to ensure that the UK derives the maximum potential economic benefit from the new technology and the Government is in principle sympathetic to the proposal for an expansion. The subsequent Enquiry under Lord Hunt into the broadcasting policy aspects of an expansion reported on 30 September. The Government are now considering some of the somewhat controversial issues that an expansion would raise and the Government expects to announce its overall intentions towards cable before the end of this year. The Department of Industry sees the potential expansion of cable systems as a major stimulus to IT particularly in view of the scope it offers for the widespread development of interactive services such as home based banking, shopping and business communications.

#### Standards

One of the priority areas for information

technology infrastructure must be standards. These are an inescapable requirement for the development of information technology.

The Department of Industry therefore established in April 1981 the FOCUS Committee on Information Technology Standards. FOCUS' membership covers representatives from the supply industry, the private and public sector users, and from Government and other bodies associated with IT standards. FOCUS seeks:

- to identify areas within which IT standards could produce the most benefit;
- to promote the acceptance of existing IT standards in those areas, and
- to encourage the production of new IT standards, and to devise ways of promoting adoption and use of those standards.

This is a broad remit. FOCUS has therefore identified several key areas where early action should be the aim.

- (1) – open systems interconnection or OSI (this is the concept that any data processing system should be able to communicate readily with any other);
- (2) – local area networks or LANs (a LAN provides a means to connect a wide range of equipment within the boundary of a limited area.
- (3) – teletext, viewdata and
- (4) – information (and text) processing.

#### Conclusion

My aim in this paper was to give you a broad idea of the type of initiatives that Government has taken to promote the use and application of information technology. World trade in IT products in 1980 was around £54bn and is expected to grow to £105 bn by 1985. This represents a 14% a year average growth, compared to a growth in, for instance, the car manufacturing industry which is forecast to grow at no more than 3% a year. However, the UK portion of this market is only 5% and is too small to sustain a viable IT industry in the UK. It is vital therefore that the UK establishes an internationally competitive position, particularly in the USA and Europe.

The IT market is big and getting bigger. It offers huge opportunities for growth, business and employment. It is vital that the UK maintains and increases its share of this growing business. I hope that I have shown that the Government takes very seriously indeed its role in promoting information technology. It is determined to ensure that British industry draws the maximum benefit from the IT revolution. It is the technology of the future: future generations of Britons will depend for their livelihoods on the success achieved now.