

# MANAGEMENT GUIDE TO IT

**Information technology is a catch-all term used to describe products and services created by rapid changes in computer and communications technologies and their fusing together (or converging). Just as hydrogen mixed in suitable quantities with oxygen creates water so computers mixed with communications become information technology.**

The chemical analogy is simplistic. Under the general banners of computers and communications are gathered arrays of disparate sciences — semiconductors, optics, magnetics, mechanics, electro optics plus logic and soon artificial intelligence. Mixed together and applied in different ways they are the standard bearers for the new industrial revolution. Water provided power for the first industrial revolution, information technology is the powerhouse for the revolution we are now experiencing.

Revolutions bring great change. For business they can accelerate growth or decline. They can change the way you do business. They can change the business you are in. They can create entirely new businesses and they can bury long established businesses.

The first step in this guide to information technology is the recognition that the subject is about change and that the management of that change is the greatest task that confronts us.

During the last thirty years the growing use of ever more advanced computers has become accepted. Most businesses today cannot function economically without

computer power. But to-date, except in some specialised areas, computers have been used for tactical reasons — to control overheads, to produce accounting information, to maintain personnel functions and the like. In recent years, particularly with the minicomputers of the 1970s, we have seen computers spreading into many new areas and starting to do things that previously were impossible to do by any means known to man — such as computer-aided design of micro-miniaturised devices. This led to computer-aided manufacturing — making products that man could

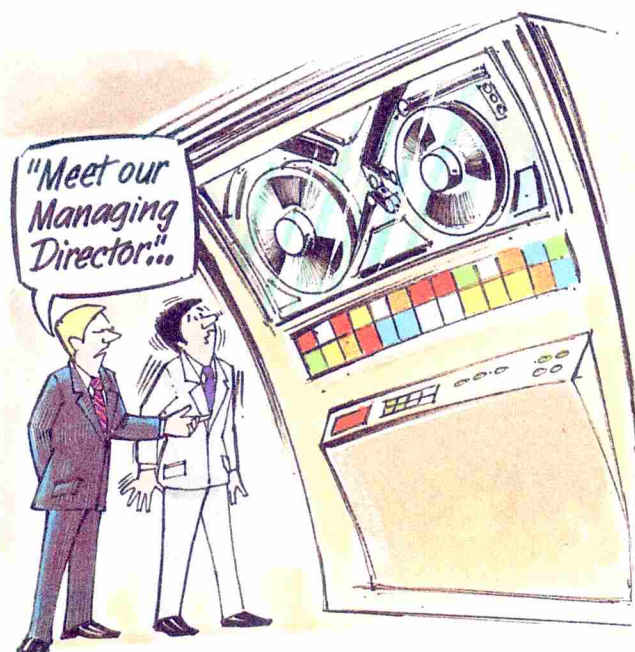
not make alone.

With these developments the strategic business implications of this electronics revolution that we call information technology came to the attention of top management. This new technology could be applied to the principal strategic stages in which a business adds value — production, design and development, distribution and marketing for example. Technology could be used as a 'competitive weapon'. In companies in the fields of optics, integrated circuits, software development, chemicals and oil, technology has long been a competitive weapon.

With information technology, companies previously neutral to technology in finance, insurance, distribution and marketing can and will use or experience this technology as a competitive weapon.

Companies can awaken to this weapon, with no prior requirement for knowledge, when their competitors use it. The knowledge thereafter hurriedly gained could prove expensive. The demise of the analogue watch industry is a good example of the sword of Damocles approach to technology.

On the other hand, companies could seek to use the weapon themselves. If the experience in other high technology industries is relevant there are three rules for success. Firstly, top management must be fluent and comfortable in technological topics which means they must have had technical education. Secondly, management must be capable of choosing technologically based projects that serve to enhance strategic position in chosen fields. The leverage possibilities of using information technology to differentiate products and change market positioning are often substantial. Delivering old movies by





video cassette for example created new markets for old products. The third rule is that the systems and structures of the company should be tightly coupled to provide connection between business and technological decision-making and that the technological decision-making should be consistent with the company's other systems.

It is also clear that moving a company, for strategic reasons, from a low technology profile to a higher technology profile is not an overnight activity. Before using information technology strategically the goals, capabilities, positioning and constraints on the enterprise must be established.

Nowhere are these issues better seen than in the information industry itself where major corporate reorientation is under way to address the opportunities of change. To the strategic issue can be added technology, market and productivity issues. Product and process differentiation through innovation and investment provide competitive advantage. Market tactics identify the niches and pour concentrated resources at the weakest position of the competitor. Productivity management focusses on chosen added value sectors such as low-cost producer, distributor or operator<sup>2</sup>.

Reorientation is not limited to applying information technology. Study of successful Japanese companies has led to a growing awareness of management techniques and philosophies that appear well-suited to change. Most Western management education of the last twenty years included a mandatory study of McGregor's Theory X and Theory Y management styles<sup>3</sup>. Theory X — people are irresponsible and need negative incentives to work — and Theory Y — workers seek satisfaction and achievement — have

been part of our management culture. Inevitably there has been a switch from Theory X to Theory Y management probably as much because of cultural and social changes as business needs. But now we have Theory Z — a statement of Japanese management principles applied to Western business practice<sup>4</sup>. Theory Z "has the objective of developing the ability of an organisation to coordinate people, not technology, to achieve productivity. In part this involves developing people's skills but in part it also involves the creation of new structures, new incentives and a new philosophy of management".

The Japanese concepts

implications but other implications and examples are worthy of note.

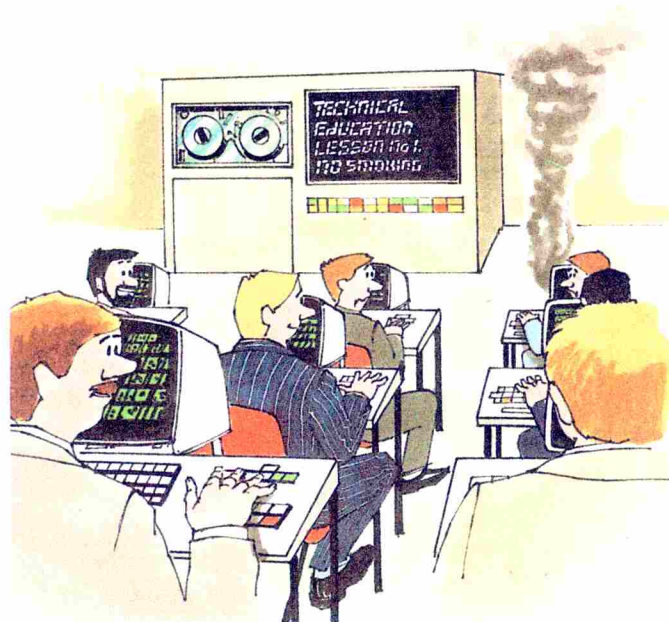
Information technology has created an information industry where not all of the participants yet recognise that they are in the same industry. Who previously could say that telephone/telegraph operators, gaming machine manufacturers, consumer electronics manufacturers, news services, advertising, libraries, contract programming, broadcasting, cable TV, publishing, postal services, computer manufacturers, office equipment manufacturers, applications software, time-sharing and telecommunications manufacturers are all in

flagged for maximum attention if you are a knowledge worker with a high disposable personal income or a large corporate budget. Depending on industry, there are specific applications from which strategic benefit can be obtained. In manufacturing, computer-aided design and manufacturing; in publishing, computer assisted makeup and imaging; in retailing, electronic point of sale; in banking, automated cash dispenser and teller services; in shares or commodity trading, automated trading systems; and in education, computer-based training.

The various market categories are not exclusive. Some products cross all market sectors. The telephone in its modern full-featured form is a universal product. The television with teletext, videotex and video cassette is moving from a domestic product towards being a universal product. Electronic mail and personal computing have a similar universal appeal. Personal computing is fragmenting into domestic and business sub-markets but the knowledge worker with a full-featured personal computer system at home again provides a linking market.

Choice of product or service to achieve a desired goal will grow. For example a TV programme may be distributed by broadcasting (either terrestrially or via satellite) and by cable, both of which will be services or by video cassette or video disks both of which could be purchased products. This type of product or service choice will pose new decisions for the consumer and will create new marketing strategies.

The business implications revolve as ever around threats and opportunities. The change implicit and sometimes explicit triggered by



of trust and group participation — evidenced for example by Quality Circles — provides a basis for exposing issues so that change can begin to happen. It will be interesting to see how far these kinds of philosophies, styles and techniques are adopted by Western organisations and how far they will impact business results.

If the first step in our guide was the management of change, the second step must be the business implications of change. Because issues inter-relate we have already touched on some

the same industry?

On this basis when today's child asks, "Daddy, what industry are you in?" one may need to pause and think.

Mapping the information business is not easy but a strategic framework is necessary and definition of position is fundamental<sup>5</sup>. If you are part of it, you need to know where you fit. If you are not part of it, then inevitably you will be a consumer of its products and services. To escape from it entirely seems, at present, to be impossible.

As a consumer, you will be categorised into business or domestic and



information technology will injure the ill-prepared and reward the knowledgeable. Knowledge is the transforming resource in creating the business of the future.

The third step is to highlight some working examples of the new technology. There is no better example of technology being used as a competitive weapon than in videotex. Videotex was originally conceived as a mass-market domestic information service and was invented and pioneered in the UK.

The domestic market has proved to be elusive, but in the last two years a private business videotex market has risen Phoenix-like.

With private videotex systems — soon to be re-named Corporate Videotex — enterprises have begun to create new electronic communication links with customers, agents, distributors and clients. By putting the customer on-line to the corporate database, enterprises have cut long-winded communication chains, speeded-up vital communications, become more reactive and supportive of customer needs and saved money by externalising their own labour costs. When the customer switches to Do-it-Yourself processing, the enterprise does not need to duplicate it.

An enterprise that gets the customer 'on the system' effectively locks out its competitors. Customer services have entered the information technology era. It cannot

be coincidental that whole industries are moving in this direction. The travel trade will soon be saturated with DIY systems. Virtually all motor dealers will be on-line over the next 12 months. Other industries are working hard behind closed doors to get to market. Being in an industry that is moving in this direction and being without a plan for DIY is tantamount to pursuing a withdrawal strategy.

In other fields, information technology is carrying on its traditional role of containing overheads. Office automation is still focussing on text processing but the advent of the personal computer for non-clerical functions is developing awareness of the possibilities of improving productivity of technical, professional and managerial staff.

Long before the local area networks arrive in any volume, the multi-function personal computer terminal which looks into different databases and telecommunication networks will have created the market for management workstations. Business will find professional-standard personal computers and use them extensively.

The classical computer system will continue to develop. Micros, minis, superminis and mainframes will continue to deliver improved price/performance. Standardisation is an unstoppable force. The 'de facto' 16 bit standard operating system will be Unix and in 18

months time products that can't use Unix and handle X.25 will be dwindling at every level below large mainframes. The day of the portable operating system has arrived.

Smart telephone systems are a reality. Most people can use them and save money using them. From feature 'phones to private exchanges to new services, our use of telephone technology will undergo a quantum change. Recognition of the convergence between computers and communications will lead to the rise of Corporate Systems and Communications Groups replacing DP departments and management services.

The next 12 months will see the office system contenders in the market with working systems. The Local Area Network debate about the role of Baseband, Broadband and Ring will be largely over and the future will be much clearer.

In the consumer market, personal computers will boom. For those that don't use them now it is hard to appreciate that in a few years they may well own several computers and at least one of them will be indispensable. The calculator experience is about to be repeated.

Machine tools, domestic appliances, motor cars and toys will be full of microprocessors. The

pace of product introduction will be breathtaking.

The challenges for management will, however, remain unchanged; identifying strategic threat or constraint provided by the technology; changing in order to be able to use change; leading workforce, stockholders and customers towards new opportunities.

The time has come when every enterprise needs an IT strategy and management's job is to make sure it has one.

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