DEPARTMENT OF PRODUCTIVITY

INFORMATION TECHNOLOGY WEEK 1980

PARMELIA HILTON HOTEL, PERTH, 3 AUGUST, 1980

'FACTS AT YOUR FINGERTIPS: YES, BUT WHOSE FINGERTIPS?'

The Hon Mr Justice M D Kirby
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FACTS AT YOUR FINGERTIPS

This lunch in which we gather today to launch Information Technology Week in Western Australia is one of hundreds of events organised in all parts of our country to call attention to the most remarkable technology of our time. Information Technology Week is sponsored by the Commonwealth Department of Productivity, the Information Technology Council and the Australian Computer Soiciety. State Governments, the Trade Union movement, industry and ordinary citizens are joining in it. It is an intellectual festival. It lacks a Mardi Gras atmosphere, perhaps. You will not see dancing in the streets. And it has to be frankly admitted that not a few of our fellow citizens are apprehensive about the new technology and the problems it will bring. They question whether there is cause for celebration or a wake.

The purpose of an enterprise such as this is obviously education:

- to create awareness of the new information technology available;
- to emphasise its benefits to society, industry and the individual;
- to emphasise the need to adapt to it, if Australia is to remain competitive;
- to demonstrate the impact on work, sport, health, education and recreation; and
- to prepare society to cope with the challenges posed by the new technology, for challenges there will be.

The mind of man has tapped resources to pose for our time uniquely troubling social and moral problems. Nuclear fission is presented by some as the answer to the world's energy needs. To others it is seen as specially dangerous and specially destructive. The advances of human biology present the miracles of transplant surgery and artificial insemination. But they also present us with the moral dilemmas of the test tube baby, genetic manipulation and even, now, human cloning. Equally remarkable are, the advances of the new information technology - the development of the computer, the miniaturisation of the 'microchip', the linkage of computers by telecommunications and the revolution in information sciences.It has been said that we are at the brink of a new industrial revolution, even more dynamic than the first. By a most remarkable combination of transistor technology and photo-reduction techniques, the 1970s saw moves towards the steady miniaturisation of computer resources. By processes of photo-reduction 100,000 transistors can be intergrated with circuits, crammed into a single quarter inch of silicone. This silicone 'chip', the 'microchip', seems every day capable of containing more and more data. The data is retrievable at ever increasing speeds and constantly diminishing costs. A recent magazine article put it graphically. If the automobile industry had been able to boast the same diminution in costs as the information industry has over the last decade, the Rolls Royce would today be selling for $70. I cannot imagine that even my good friend Rob Holmes a'Court could promise us a Rolls for $70.

The figures illustrating the incredible advances of information technology that constantly bombard us. They leave us bemused and confused:

- The cost per function of a chip has reduced by more than ten thousand fold in fifteen years.

- To hire a circuit on an earth satellite for a year in 1965 cost $30,000. In 1980 it costs $700.

- To buy a satellite earth terminal in 1965 cost $100,000. By 1979 it cost $12,000. This year they are going at $1,000.

- Bubble memory - in 1975, 256,000 bubbles on a chip; 1979 - 1 million bubbles, 1980 - 27 million bubbles.

- A single optic fibre, one-fifth of the thickness of a human hair, can in 1980 do the work of ten thousand ordinary telephone wires.

- The New Scientist recently estimated that by the mid 1980s the volume of data transmitted daily through telephone lines in Europe alone would, if stretched out in typed sheets, encircle the world nearly twice.

And so it goes on. In practical terms, it means a tremendous growth in the amount and availability of information. Man's mind is suddenly stretched enormously by having, literally at his fingertips, a seemingly limitless deposit of information. What used to be hidden away in books or manual files: difficult to access, time-consuming to find, susceptible to loss and destruction, is now, increasingly, 'on line'. The mind of the computer supplements the mind of man. Our human intelligence is complemented by machine intelligence. The machines can do many things. They promise a release from the dull routine which so often marred the 'dark satanic mills' of the first Industrial Revolution. This week's theme, 'Facts at Your Fingertips', captures the idea: human beings are now extended by information, retrievable in dazzling quantity and variety, from our new companion, the computer.

THE IMPACT ON AUSTRALIA

We in Australia are uniquely placed to take maximum advantage of the new information technology. 'Distance' was described as the 'tyranny' of our country. Suddenly distance has become less important as computers speak to computers and to man via telecommunications. There are other imperatives. Our trading partners and competitors are rapidly moving to the new technology to secure the cost advantages which it promises. The sad fact is that for all its wealth in other respects, Australia does not do well in the education league, the research league or the world pecking order of productivity. In education, we lag seriously behind other like countries in school retention rates. According to recent O.E.C.D. figures, at 17 years Japan has 88.1% of its population still in education. The United States has 84.6%. We in Australia have only 39.9%. Conceding that it must be education for a new world (including the preparation of future generations for greater use of leisure), there is little doubt that we should be doing better.

In research and development, Australia also lags seriously behind. It spends only on average 0.8% of a company's budget on research and development. The average for most Western nations is 3-4%. If, at a time of unprecedented technological advance, we in Australia contribute to it below our share, we will either fall behind or have to buy technical know-how at disproportional cost. It is for this reason that the Department of Productivity has an Industrial Research and Development Incentives Grant Scheme, designed to encourage industry to do more of its own research and development and to make an Australian contribution to the intellectual capital of the world.

We are also low in the order of productivity growth. Whereas Japan can boast an annual growth of 9.7% in gross domestic product per person and the Federal Republic of Germany 7%, our figure in Australia is closer to 1.8%. It was 3% growth in 1950. It was precisely to meet the unhappy coincidence of low productivity growth at a time of

technological explosion that the Federal Government in 1976 created the Commonwealth Department of Productivity. The Prime Minister said that the government's aim was to 'encourage innovation and technology so that Australian industry might benefit in two ways - firstly by reducing cost structures on the domestic scene and secondly by assisting in our competitive position overseas'.

The technological revolution through which we are now living will apply pressures on Australia which will, in large measure, be irresistable. As our competitors and trading partners embrace the new computerised technology, we will be encouraged, even forced to do so. Let us hope that in this race we are not find ourselves at the tail end of the flock.

THE VULNERABILITY OF WIRED SOCIETY

The theme of Information Technology Week 1980 is 'Facts at Your Fingertips'. A legitimate question, asked by many thinking citizens, is 'Yes, but at whose fingertips?'

It is now generally recognised, including by passionate advocates of the new information technology, that it brings in its train a number of problems. They may be summed up in the expression 'vulnerability'. The information society is a more integrated society. It is more vulnerable for that reason.

In the forefront of legitimate concern is the impact of the new information technology on employment. I do not join the prophets of doom and gloom who predict that vast numbers will be thrown into idleness by the technology. Such predictions have accompanied every major technological advance of recent times. After a period of adjustment, they have proved baseless. By the same token, there seems little doubt that the new technology will cause problems. Many thrown out of work will be in particular pockets of employment which suddenly become less competitive when measured against automated processes. Many of the people dislocated in this way will be unsuitable for post-computerised employment. We must be sensitive to their predicament. We must be alert to our duty to them, as fellow citizens, struggling with the inevitable loss of self-respect, which unwanted unemployment brings to most Australians. The Calvinist ethic dies hard. I suspect that there is a fair incidence of workaholism in this very room.

The second aspect of vulnerability is one of particular concern to me. It is the impact of the new technology upon individual liberties and privacy. There was a certain protection in the inefficiences of old manual systems. Past error tended to become forgotten with the passage of years, simply because the information could not be so readily, quickly and inexpensively retrieved. The new information technology puts old

facts at the fingertips of many. The capacity to integrate information, to build up 'data profiles', to make decisions on the computer dossier and to 'see' citizens through their computer image, presents society with special new problems. These problems have been addressed by the Australian Law Reform Commission in two discussion papers which are now being distributed nationally. They propose the establishment of a Privacy Commissioner, aided by a Privacy Council and (in limited circumstances) by access to the courts to defend individual information privacy. I am pleased to say that the Law Reform Commission of Western Australia has been given terms of reference on privacy protection by the State Attorney-General, Mr Medcalf QC. Its terms parallel those of the Federal Commission. We are working most closely with our colleagues in the Western Australian Commission. The spectacle of inconsistent and sometimes ineffective European laws on privacy protection is a warning to us all in Australia. At a time when the technology is so pervasive and so universal, it is vital that we should devise harmonious and complementary Commonwealth and State laws. With the assistance of colleagues, in most of the jurisdictions of Australia, we are working towards this gaol.

THE NEW VULNERABILITY

One aspect of vulnerability has not yet been systematically addressed in Australia. It is one which that I believe we will need to examine with care before too long. It is analysed in a recent Swedish Government report titled 'The Vulnerability of Computerised Society'. In this report, a Swedish Committee examined 'vulnerability factors' under two heads: external and internal threats. The first was concerned with acts of war and terrorist actions. The second comprised 'such factors as are more or less built into the actual use of computers e.g. concentration of computer operations, the dependence on competent staff and on information from abroad'.

The Swedish report addresses problems which will have to be faced in all Western countries, including Australia, as the new information technology becomes more pervasive. Among the 'vulnerability factors' listed are :

- Criminal acts such as sabotage, espionage, and susceptibility to terrorism. Already terrorist attacks have been made against data processing centres in Italy and France. Special criminal legislation has been enacted in Italy.

- Misuse for political or economic purposes. Threats of economic sanctions may in the future, according to the Swedish report, be 'an increasingly common means of pressure to attain political aims'. The specific concern of the report was Sweden's high dependence on imports of computer equipment, services and data and the fear that this sector might become 'an attractive object for attack'. 'Even a limited blockade

against the import of spare parts' would, according to the report, 'very quickly have serious effects'. The dependence on the political situation in other countries processing data abroad, provides the opportunity, in an interdependent world, to exert pressure 'by the threat of cutting off circuits or other obstructions'. These problems simply do not exist in the self sufficient world of localised information. They are by products of a world of interlinked computers.

. Acts of war. The concentration of computer capacity in metropolitan areas make occupation of limited parts of a country much more important nowadays than they were, even in the recent past. Capture the computer centres, says the Swedish report, and you capture the dependant society.

. Catastrophies and accidents. Quite apart from man-made disasters, natural or perfectly accidental catastrophies can immobilise the information society, if it is not prepared for them. Not only may installations themselves be damaged or destroyed. Operations far away may be disturbed by failure of power telecommunications or other supplies. The location of important computer installations in areas where there was a risk of landslide or near large airfields should be specifically avoided.

. Personal and confidential registers. In times of war or crisis, access to large-scale registers containing personal data could enable identification of 'key persons' especially if the registers are linked together:

> 'For example different groups of special interest could be picked out and placed geographically on different kinds of maps. As the co-ordinates relate to property, the location can be determined fairly precisely. ... If the data are also accessible from terminals in mobile units, the control of the population's movements could be very effective'.

The confidentiality of company information is also stressed.

. Functionally sensitive systems. Banking, stockbroking , insurance and internal corporate systems may be or become absolutely vital to the smooth running of the country and especially its economy.

> 'Disturbances in systems of these kinds may quickly have effects in the form of delayed payment or non-payment; difficulty in getting out orders to production units, with consequent disruption of production; lack of control over stocks and distribution with consequent shortage of goods and disruption of production; traffic disturbances etc.'

The Swedish report recommends positive initiatives to prevent excessive geographical and functional concentration of sensitive and vulnerable data bases.

- The importance of key persons. System engineers and programmers can build up complicated systems which none other than they themselves can readily master. If documentation is lacking or defective, the user is very much in the hands of the system builder, at least for a time. Already examples can be cited where dissatisfied, dishonourable or undependable staff members can cause damage, for example, by destroying critical information.

For lack of time and on economic grounds, duplication of vital tapes or recording of successive changes in ADP systems are not always maintained. The Swedish report also points out that:

> 'If data processing is done on a computer in another country or on another continent, and if input and output data are to pass through several countries, the misappropriation risks of various kinds increase. Protection against events abroad is naturally more difficult than to build up a domestic system of protection.'

WHAT CAN WE DO?

In a week when we should be rejoicing in our new technology, I am not here to spread doom and gloom. Doctor Samuel Johnson once said:

> 'Depend upon it. If a man talks of his misfortunes there is something in them that is not disagreeable to him.'

I believe, however, that it is a healthy function of Information Technology Week that we should address ourselves not only to the great advantages of the technology (which largely speak for themselves and argue their merits in dollars and cents in the market place). We should also heed the problems that attend its introduction. Privacy laws for data protection and data security will undoubtedly come. In due course of time our lawmakers will also have to face other implications of computerised society, including those of vulnerability some of which I have identified. If I am correct in this, attention will need be given to such issues as:

- the licensing of some computerised systems at least, where society is specially dependent on them;
- the new vulnerability that attends spreading computer capacity to a small scale;
- the degree of safe dependence on some foreign sources, at least in specially vital or sensitive areas;

- the standardisation of technology to provide better backup facilities when things go wrong;
- self sufficiency within some areas of computer operations so that problems do not haemorrhage throughout the whole chain of the linked, computerised society;
- dispersal of computer operations and duplication of vital stored data so that disasters (natural and man-made) are not terminally crippling to society dependent on computers.

My caution today is against underestimating or shrugging off these issues. Some of you may think that these are the esoteric and faraway concerns of the over anxious. Let me tell you they are not. They were most seriously explored in Sweden - a country which led the world in legislation on computer privacy. Already in countries not dissimilar to ours, computer terrorists have struck. Already in our own country, computer fraud is a growing concern of the criminal justice system. Within the last fortnight in Britain the business magazine, The Director, pointed out that computers will be used to exert industrial pressure in a way far more effective and instantly crippling than most present industrial disruptions. In the United States in recent weeks a 40 cent silicone chip caused a major nuclear alert twice in the space of a week when the system went wrong. The London Times of 15 July tells the humble tale of Anthony Brumwell, aged 38. Mr Brumwell was freed at the Bradford Crown Court when the judge was told that a computer error at Scotland Yard had quadrupled his number of previous convictions. The magistrate who had imposed his original prison sentence, was shown a list of eight previous convictions which included two prison sentences. In fact he had only two convictions and had never been sent to prison. The prison sentence was reduced to a fine. The 'facts at the fingertips' were just plain wrong.

Let there be no doubt: the new information technology will spread its influence through our community at the end of the Century as electricity did at its beginning. It is the way of the future. But when we celebrate 'facts at your fingertips' it is important that we ensure that the facts are fair, accurate up to date, and fairly recorded. It is vital that we ensure they are not at the fingertips of those who have no legitimate business to see them. Above all it is critical that we ensure the fingertips to which they do respond are those of a thinking humanity alert to uphold in this country the precious values of liberty and individualism which this generation has inherited and must pass to the next as faithfully as it may do in a world that is at once more exciting and more vulnerable.

Sweden, Minister of Defence, Report by a Swedish Government Committee (SARK), 'The Vulnerability of the Computerized Society'. (Considerations and Proposals) December 1979. (Official English Translation by John Hogg) Stockholm, Sweden.

Sarbarhetskommitten (SARK), 'ADB och samhallets sarbarhet