# THE ADVANCED INFORMATION SOCIETY: A SUITABLE UTOPIA FOR AUSTRALIA?

**Alan V. Watt**

*This paper considers the nature of the information society and its perception as utopia or anti-utopia. Australia is already an information society, and in technological terms, is moving towards an advanced information society. However, recent evidence on the decreased rate of growth of the information sector in the United States, the growth in importance of such areas as biotechnology, and the rapidity with which distinctly different and important problems can appear, may cause the advanced information society to be relegated to just another rejected image of perceived future societies. Thus Australian policy-makers should be cautious about selecting it as a goal.*

Keywords: information society, Australia, policy, future studies.

## INTRODUCTION

The topic of the information society has particular prominence at this time. Thus we have an important book by Masuda,[1] an EEC Conference[2] and popular symposia.[3] Referring to the first of ten major transformations taking place in society at this time, Naisbitt states

> None is more subtle, yet more explosive, I think, than this first, the megashift from an industrial to an information society.[4]

The information society provides us with an image of the present and the future which distinguishes them from the past. This is important, for as stated by Polak

> Social change will be viewed as a push-pull process in which a society is at once pulled forward by its own magnetic images of an idealized future and pushed from behind by its realised past.[5]

Thus the portrayal of the advanced information society as a utopia can provide a motivating force to members of a society. Consequently it is sensible to consider whether it is a suitable goal for Australian policy-makers.

Masuda provides a detailed portrayal of the information society in terms of innovational technology, socio-economic structure and values.[6] He derives this from its analogy with the industrial society by applying two 'bold' historical hypotheses, namely, that "the production of information values and not material values will be the driving force behind development of society", and "the past developmental pattern of human society can be used as a historical analogical model for future society".[7]

Drawing on this, and the work of other writers, the information society may be portrayed as one characterised by the convergence of certain information technologies, most importantly computers and telecommunications, interacting synergistically with such factors as the knowledge explosion, greater rate of flow of information, and social factors. Features of this society include the significance in the economy of information industries and in employment of information workers; access to knowledge is significantly from databanks; work and study may be at home using personal computers; and industrial design and manufacturing rely heavily on the computer and the robot. It is a society with an important international component, information flow tending to ignore national boundaries. The goal, following Masuda, is " . . . the realisation of a society that brings about a general flourishing state of human intellectual creativity, instead of affluent material consumption."[8]

The technological characteristics of the advanced information society may be explained by the following consideration. In the past, telecommunications messages have been transmitted in analogue form, while computers operate digitally. Thus to achieve full integration between computers and telecommunications, messages must also be transmitted in digital form. Households would have digital telephones, video terminals and other similar equipment. They would be connected by communications pathways capable of broader bandwidth than the pair of copper wires used for the transmission of analogue telephone signals. These would typically be optic fibre cables, which, with digital exchanges, would form an information network system.

In addition to this technical distinction, there are other points of difference. This is the society which has achieved the goal of the information society, and has the feature of "high mass knowledge creation".[9] Other distinctions are here taken to be ones of degree, the advanced information society being a society in which features of the information society have become extensively pervasive, and the technology used is more advanced.

Here, when considering the motivating effect, the terms may be used interchangeably. However, as argument is later accepted that Australia has already reached the stage of the information society, logically, the question considered by this paper becomes whether the advanced information society should be selected by Australian policy-makers as the utopia to achieve.

With the release of the Australian government's information industries strategy,[10] and steady movement towards the digitalisation of communications,[11] this paper considers the nature of the information society, its perception as utopia or anti-utopia, and certain broad factors affecting the question of its suitability as a utopia to be sought and presented to the Australian public by policy-makers. It finds that the information society is apparently dominant at this time over other similar images of the future. Developed nations, including Australia, already have reason to be called information societies. However, bearing in mind

that achievement of a utopia would be aided by constancy of idealised image of the future, certain factors which may act against this must be taken into account. These are that this image shares the stage with other images of the future, that it has had currency for only a limited period, and that it may be supplanted by another in a reasonably short time. Such other factors are the development of biotechnology, a possible synergism between biotechnology and information technology, and the rapidity of emergence of completely new problems. These could cause society to see the future and past in other than information-society and pre-information society terms. This suggests that policy-makers should select less specific images as goals.

## CHANGES IN NAME FOR THE NEW SOCIETY

Relevant to the selection of an information society or an advanced information society as a goal for policy-makers is the permanence and uniqueness of the information society as the image of the future. For unless the idealised future of a society is consistent for a significant time, that future is not likely to be realised.

Kumar notes the diversity of names for the new society. He states

> Thus Amitai Etzioni speaks of 'the post-modern era', George Lichtheim of 'the post-bourgeois society', Herman Kahn of 'post-economic society', Murray Bookchin of 'the post-scarcity society', Kenneth Boulding of 'post-civilized society', Daniel Bell simply of the 'post-industrial society'.[12]

And, considering the transient nature of the term, "information society", Marien, writing in 1983, points out,

> The term "information society" has only been used for about a decade, superseding the less specific label "service society", and the even more ambiguous "post-industrial society". Information Society was apparently first used in Japan in the late 1960s (Kohyama, 1968), and was the focus of the *Plan for Information Society* (Masuda 1981). Forerunners to "information society" include the terms "age of cybernation" (used widely in various forms during the 1960s), "electronic age" and "age of information" (both proposed by Marshall McLuhan in 1964); "knowledge society", described by Peter Drucker in 1969, and the ungainly "technetronic society" suggested by Zbigniew Brzezinski in 1970.[13]

Thus the information society, while probably forming the most prominent image of the future at this time, is only one of a number of such images to achieve prominence in recent years. What is more, other images of the future are used concurrently to explain our place in history.

The information society can be seen by some to be compatible with that of an industrial society. The phrase, 'second industrial revolution', was used by Wiener in 1950 to describe the effect of computers.[14] It

was still being used by Halton in 1985 to describe communications and computers.[15]

Jones speaks of three rather than two industrial revolutions, steam, electric and atomic revolutions, each marked by clusters of inventions and discoveries.[16] Of the third, he states

> The third industrial revolution permitted the achievement of huge ends by tiny means. Its base was not the production of goods and tangible services, or the elimination of muscle power by machines: it was the collection and dissemination of information, which became the central factor in the organisation of society and national economies, and promoted the global economy.[17]

As has been stated elsewhere, again emphasising the transient nature of such images of the present and future, the atomic age became the information technology age. Further, the 'third industrial revolution' mentioned by Jones can thus be seen to be similar to the 'second industrial revolution' of Wiener and Halton, again showing changing perceptions with time.

In his important work on the post-industrial society, Bell states,

> The thesis advanced in this book is that in the next thirty to fifty years we will see the emergence of what I have called the 'post-industrial society'.[18]

However, a rationale for breaking away from, or at least refining this term long before this time-period is provided by Masuda.

> Unlike the vague term, 'post-industrial society', the term 'information society' as used here will describe in concrete terms the characteristics and the structure of this future society.[19]

This statement is reinforced by Miles:

> The theory of information society is, in effect, a revision of post-industrial theory, a revision in which IT (information technology) is identified as an element without with the image of the future could not have been realised.[20]

The different names for this society mentioned above each indicate a change in emphasis in the mind of the originator, and with it, a development of thought. Thus 'post-industrial society' indicates some rejection of the image of the industrial society as a description of the present and the future, not present in those of a second or a third industrial revolution. Similarly, 'information society' indicates some rejection of the image of post-industrial society. In the case of each rejection, the implication is that the change is so significant that the earlier term must be rejected. Thus, in its turn, the advanced information society may be rejected in favour of another image. This fact could argue against its use by policy-makers as the utopia towards which to direct policies, due to the time limitation of its predominance.

## DEVELOPMENTS AWAY FROM INFORMATION SOCIETIES

There are other developments which could cause the image of the future to be seen in other than information society terms. Thus Marien points out

> It should also be acknowledged that there are other technological revolutions that could have an even greater impact on society than the new information technologies.[21]

He then lists the biological revolution which could retard the aging process, solar cell technology revolutionising energy production, and cataclysmic detonation of nuclear weapons as examples.

Again, Rifkin has a different perspective, in speaking of biotechnology, the fusion of biology, computerisation and automation.

> The age of pyrotechnology began in earnest around 3000 B.C. in the Mediterranean and Near East when people shifted from the exclusive use of muscle power to shape inanimate nature, to the use of fire.
>
> We are moving from the age of pyrotechnology to the age of biotechnology.[22]

This line of thought is developed by Rifkin in a manner which distinguishes it from the characteristics of the information society.

> Within the coming decade, the computer industry and the life sciences are expected to join together in a new field-molecular electronics.
>
> Scientists even envision the day when computers made of living material will automatically reproduce themselves, finally blurring the last remaining distinction between living and mechanical processes.[23]

Masuda in fact alludes to this in a 1985 paper, stating,

> . . . a biocomputer will some day be developed as the sixth generation computer equipped with structure and functions similar to the human brain.[24]

Further, the fact that perceptions of the future can change at an extraordinary rate is illustrated by the rapidity of changes in attitude towards the development of the AIDS disease. This disease, which was only identified 7 years ago was stated by the Director-General of the World Health Organisation in 1986 to be "a very serious pandemic as mortal as any pandemic there has ever been".[25] Further, it is stated to be "the leading cause of death in New York City for both men and women in their 30s",[26] a World Health Organisation projection indicates that 100 million people will be infected world-wide in 1991, if no vaccine has been developed before then, causing 50 million deaths in the 1990s,[27] and that as early as 1991, AIDS could cost central African countries more than the total worth of foreign aid flowing into the region for any purpose.[28]

This example, with its implications for economies, priorities in allocations of resources, and capacity to occupy the minds of those concerned with images of the future, surely has the potential to displace

the information society as the leading image of the future by some different image associated with world health.

It can thus be seen that the information society image is currently competing with other images of the future. Some of these show a natural progression, but others, such as the age of biotechnology, vary to such an extent that the information society has difficulty in accommodating it. Further, the example of the rapidity of development of the future image of an AIDS pandemic, with its extensive implications, indicates just how quickly perceptions of the future may change. Thus any decision by policy-makers that the advanced information society is the utopia to be sought, must contend with the likelihood of changing perceptions of the future which conflict with this.

## THE INFORMATION SOCIETY, PRESENT AND FUTURE

The technological development critical to the present image of the information society has been stated to be the use of telecommunications with computers. This development, variously called telematics from the French *télématique*, compunications, the information network system and telecommunications and the computer (TC), provides the most significant basis for the technological and other aspects of the society. As stated by Goldsworthy, "Computers and communications technologies are the *sine qua non* of the information society".[29]

A high rate of development of these areas is occurring. Thus the technological developments which were anticipated to influence patterns of transactions and work in the decade of the 80s were stated by Bell to be data processing networks, information banks and retrieval systems, teletext systems, facsimile systems and interactive on-line computer networks.[30]

Four major developments in the five years to 1985 are listed by Forester. These are firstly that computer software has gained in importance relative to hardware, secondly that the personal computer "has become the basic building block of the information technology revolution", thirdly, that there is now a race existing (mainly between Japan and the United States) to build the fifth-generation computer, a supercomputer which will exhibit artificial intelligence and finally, the "explosion of innovation in the whole area of telecommunications."[31]

Probably the most developed limited example of the advanced information society is presently provided by a Tokyo suburb, where special digital telephones, video terminals and other equipment are connected via digital exchanges and high-capacity optical fibre cables. This is currently being used in a telecommuting or working from home experiment. The Japanese intend that theirs will be the first country to run optic fibre cables into very home.[32]

In many developed countries, including Australia, digitalisation is taking place rapidly. Optic fibre cables, appropriate to wide-band digital

transmission, have already been installed between Sydney and Melbourne, and in part of the central business district of Melbourne. Similar upgrading of Sydney's central business district is due for completion in 1988.[33] The first fibre optic undersea cable from Australia is due for completion in 1991.[34]

From the speed of technological developments indicated above, it must be deduced that the image of the information society is itself in a process of change. When the image itself changes sufficiently, there is a greater likelihood of its becoming identified as a distinctly new image of the future, and a new name for it found. At this time, change in name from 'information society' to 'advanced information society' appears to cover recent changes to the perceived society of the future. However, there is a possibility of technological developments occurring which would change the emphasis from information to some other factor, in determining the characteristics of society.

## ECONOMIC CONSIDERATIONS

The importance of the technical features of the information society to the economy of nations is indicated by Minc.

> The evidence clearly shows that in forthcoming years data processing or teleprocessing, taken in the broad sense, will lie at the root of all productivity gains.[35]

Considering the information sector as a sector of the present economies of countries, Mandeville and Macdonald point out,

> Economies have traditionally been analysed in terms of three broad sector groupings: primary (agriculture and mining), secondary (manufacturing), and a huge and amorphous residual — the tertiary sector (service activities). More recently, with growing awareness of the emerging post-industrial, information-oriented, knowledge-based economy, itself associated with the increasing pervasiveness of intelligent electronics, analysts have recognised the efficacy of defining separately a fourth sector, the information sector.[36]

A method of defining the information sector is through the proportion of workers in information occupations. Thus

> . . . the criterion by which we delineate an "information occupation" is not so much its information content as its primary purpose.[37]

Are developed countries in fact moving towards advanced information societies, in terms of sectors of their economies? The evidence is not as consistent and conclusive as might be thought. The following is recounted by Rubin.[38] Using the related term, knowledge industries, Machlup estimated that in 1958, these were responsible for almost 29 per cent of the GNP of USA, and that this group of industries was growing at a rate which was dramatically faster than the economy as a whole.[39] Rapid growth was confirmed by the seminal work by Porat

and Rubin (1977).[40] A subsequent work by Rubin and Huber (1986),[41] completing revisions to a later work of Machlup[42] after his death, showed that the proportion of GNP due to knowledge production in the USA had remained stable at roughly 34 per cent for a decade, employment in the 'knowledge-producing industries' having levelled off at 41 per cent of the workforce.

Rubin states,

> The overall growth of the so-called "information sector" in the United States economy has slowed dramatically in recent years, to the point where it is now growing no faster than other parts of the economy.[43]
>
> The dramatic slowing in the growth of knowledge industries and occupations reported in *The Knowledge Industry in the United States: 1960-1980* is an extremely surprising finding. The surprise is particularly acute given the profusion of studies appearing in recent years estimating that growth in these industries and occupations was extremely rapid, certainly much faster than in the economy as a whole. Many of these studies, however, had simply extrapolated the findings contained in earlier studies, and were not based upon new empirical research.[44]

On the basis of this report, a *Futures* editorial referred to the 'Knowledge Society', and asked the rhetorical question, "on what rocks did the information age founder?"[45]

On the other hand, Soupizet makes a considerable claim for the presence and growth of the information society at this time, and for its future augmentation.

> Over half the working population of the industrialized world is employed in the information industry and its related fields; information accounts for almost 60 per cent of the GNP of the USA and over 55 per cent of the total GNP of the EEC.
>
> The turnover of the information industry in the world in 1986 was expected to be not far from $200 000M; in 1987 it will have become the largest industry in the world. In the year 2000, it will account for about 40 per cent of the world's industrial production.[46]

Engelbrecht considered the primary information sector (PRIS) and the secondary information sector (SIS) of the Australian economy. He states,

> The data presented show the importance of the information sector in Australia, which accounted for about 41.5 per cent of the labour force (PRIS plus SIS) and about 31 per cent of value added in 1981.[47]

That Australia is an information society is unequivocally stated by Jones:

> Australia is an information society in which more people are employed in collecting, retrieving, amending, and disseminating data than are producing food, fibres and minerals, and manufacturing products.[48]

There is apparent conflict between the statements by Rubin and Soupizet above, insofar as the information sector of the USA is concerned. If Rubin is correct, the movement from information society

to advanced information society in the case of the United States in other than technological terms, with possible implications for other countries, is open to question. Nevertheless, the present great importance of the information sector to the economy, both in terms of GDP and employment, in advanced nations, including Australia, appears to be undisputed.

## THE INFORMATION SOCIETY AS UTOPIA AND AS ANTI-UTOPIA

The place of utopias and anti-utopias in history has been well documented, analysed and compared by Kumar, [49] and been the subject of a recent symposium.[50] However, these stop short of consideration of the information society as a utopia, although Kumar mentions Ernest Callenbach's 'Ecotopia', where a concern for ecology, is mixed with the new technologies. He describes it as involving

> a society fully wired up by cable, factories where small teams of workers apply their creative skills to components made by advanced automated machines.[51]

It is therefore sensible to briefly explore certain utopian and anti-utopian views of an information society, both fictional and analytical.

A utopian view is put forward by Macrae in a work of fiction, which purports to be a history of the years 1974 to 2024.[52] This is imbued with an air of optimism, assuming the further development of the combination of telecommunications with the computer terminal. Its capacity to tap the ideas of a good proportion of the human race, gradually solves such international problems as the north-south economic disparity. Automatically updated databases become the chief instrument of education and research. National governments become less important, their restrictions having tended to inhibit solutions to international problems in the past.

Masuda sees the possibility of solution to present problems of the world by this type of society, seeing the spirit of the times to be globalism (symbiosis of man and nature).[53] Such features as greater citizen participation and the creation of voluntary communities are enhanced by the telematics feature.

Stonier displays optimism and a concern for human welfare, in speaking of moving towards a global economic ethos.

> . . . we need to develop an economic ethos centred on increasing global productivity as a whole, to everyone's benefit . . .[54]

The utopian view of the information society thus has many supporters. Its characteristics of globalism, the decline in power of nations as opposed to individuals, informalisation and capacity to solve present major problems are features which make it potentially attractive.

However, one might speculate on whether these features are essential to the information society, or simply attached because such problems occupy the minds of thinking people at this time.

Considering the opposing image of the future, Kumar states,

> As nightmare to its dream, like a malevolent and grimacing *doppelgänger,* anti-utopia has stalked utopia from the very beginning.[55]

Thus anti-utopian views are expressed by many. The possibility for misuse of state power and information technology, such as closed-circuit television and propaganda broadcasts, to control the individual is shown in the well-known anti-utopian fiction, 'Nineteen-eighty-four'.[56] Vacca sees the possibility of such a society as the information society never being realised, a dark age replacing it.

> One of my contentions is that the proliferation of large systems until they reach critical, unstable, and uneconomic dimensions will be followed by a breakdown at least as rapid as the previous expansion and will be accompanied by many catastrophic events.[57]

However, the power to utilise the technology to create either utopian or anti-utopian outcomes are seen by many commentators. Thus Rosenbrock *et al* state:

> The new technologies of microelectronics and computers and communications can be used to reinforce and extend the historical process of subordinating men and women to machines, and of eliminating their initiative and control in their work. They can also be used to reverse this process, to develop a technology that is subordinate to human skill and cooperates with it.[58]

Similarly, referring to serious new challenges that France faces, Nora and Minc state:

> The increasing computerisation of society is a key issue in this crisis and could either worsen it or help solve it. Depending on the policy into which it is incorporated, computerisation will bring about changes for the better or for the worse; there is nothing automatic or preordained about its effects, which will depend on how relations between the government and French society develop in the coming years.[59]

More specifically, they state of a suitable policy,

> The policy must enhance the positive effects of telematics on productivity and compensate for its negative effects on employment; it must derive maximum benefit from newly created possibilities for reorganising administration, support small and medium-size businesses, restructure big business, and regulate working conditions.[60]

While the information society can be seen as a global utopia, anti-utopian views of it have also been effectively propounded. The possibility of the information society being seen as a utopia, then later as an anti-utopia, due to developments, or a change in perception, must also be taken into account. Of particular interest to those determining the goals of policies, is the comment that much depends on the relationship

between governments and societies, and that governments should aim for policies which enhance positive effects and compensate for negative effects of the information society.

## DISCUSSION

Is the advanced information society a suitable utopia for Australia, and is Australia moving in that direction? Is it a goal which policy-makers should use as an aim of policy, and present to Australians as one worth pursuing?

Evidence has been presented that in terms of its economy, Australia is already an information society. Further, with its recently released information industry strategy, and evidence of movement towards digitalisation of communications, Australia can reasonably be presumed to be moving towards the advanced information society, in technological terms at least. As it is maintained that "Every major country is taking steps to boost its domestic hi-tech sector with a wide variety of support schemes,"[61] it can reasonably be supposed that any competitive economic advantage given to Australia by an information industries strategy, will be hard won. Also, noting the surprising finding by Rubin that the information sector of the economy of the United States has slowed to that of the economy in general, the question must be raised as to whether, after initial high growth, the information sector of the Australian economy will also slow. Considering this, the achievement of the advanced information society in economic and social terms, as opposed to technological terms, in certain countries, including Australia, could be questioned. Further, the goal of the information society, as depicted by Masuda, of bringing about "a general flourishing state of human intellectual creativity, instead of affluent material consumption", appears to be far from being achieved.[62]

Bearing in mind the recentness of the introduction of the term 'the information society' to describe the present and future of society, and that this image of the future shares the stage with others, some not compatible with it, the question must arise as to the length of time for which the advanced information society will be perceived as a suitable utopia to achieve. Whether or not this is significant, noting the recent rate of development of technology, the nature of the information society can be expected to be continually changing. The advanced information society will cease to be a sensible goal if some major event or some development of thought causes history to be seen in other then pre-information society and information society terms. At the present time, two reasonable contenders for such a change in perspective would appear to be firstly the development of biotechnology, and secondly, a synergism between biotechnology and information technology. Further this major event or development of thought could quickly materialise in some completely different area, for which an example has been given.

Anti-utopian as well as utopian futures associated with information societies have been propounded, and it must be taken to be possible that some of these could be realised. The realisation of a utopian advanced information society for Australia would be made more likely by suitable government policies and strategies, and by the acceptance of these by Australian society. However, the possibility of this society being perceived as anti-utopian will always be an inhibiting factor.

Utopias associated with the information society have considerable power to direct policies and motivate populations. However, bearing in mind the arguments presented above, it could be wiser for policymakers to be guided by more general principles, such as suitably applied science and technology. This could be the factor which could lead to a less specific goal associated with the determination of policies. However, aspects of the information society should continued to exist in the future we perceive unless quite extraordinary events or developments of thought occur.

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