Technology And The Future Of Work Essay, Research Paper

Technology and the Future of Work

Every society creates an idealised image of the future – a vision that serves as

a beacon to direct the imagination and energy of its people. The Ancient Jewish

nation prayed for deliverance to a promised land of milk and honey. Later,

Christian clerics held out the promise of eternal salvation in the heavenly

kingdom. In the modern age, the idea of a future technological utopia has served

as the guiding light of industrial society. For more than a century utopian

dreamers and men and women of science and letters have looked for a future world

where machines would replace human labour, creating a near workerless society of

abundance and leisure. (J Rifkin 1995 p.42)

This paper will consider developments in technology, robotics, electronic

miniaturisation, digitisation and information technology with its social

implications for human values and the future of work. It will argue that we have

entered post modernity or post Fordism, a new age technological revolution,

which profoundly effects social structure and values. Some issues that will be

addressed are: elimination of work in the traditional sense, longevity, early

retirement, the elimination of cash, the restructuring of education, industry

and a movement to global politics, economics and world government.

In particular this paper will suggest that the Christian Judao work ethic with

society’s goals of full employment in the traditional sense is no longer

appropriate, necessary or even possible in the near future, and that the

definition of work needs to be far more liberal. It argues that as a post market

era approaches, that both government and society will need to recognise the

effects of new technology on social structure and re-distribute resources, there

will need to be rapid development of policies to assist appropriate social

adjustments if extreme social unrest, inequity, trauma and possible civil

disruption is to be avoided.

Yonedji Masuda (1983) suggests we are moving from an industrial society to an

information society and maintains that a social revolution is taking place. He

suggests that we have two choices ?Computopia’ or an ?Automated State’, a

controlled society. He believes that if we choose the former, the door to a

society filled with boundless possibilities will open; but if the latter, our

future society will become a forbidding and a horrible age. He optimistically

predicts our new future society will be ?computopia’ which he describes as

exhibiting information values where individuals will develop their cognitive

creative abilities and citizens and communities will participate voluntarily in

shared goals and ideas.

Barry Jones (1990) says we are passing through a post-service revolution into a

post- service society – which could be a golden age of leisure and personal

development based on the cooperative use of resources.

Jeremy Rifkin (1995) uses the term ?The Third Industrial Revolution’ which he

believes is now beginning to have a significant impact on the way society

organises its economic activity. He describes it as the third and final stage

of a great shift in economic paradigm, and a transition to a near workless

information society, marked by the transition from renewable to non-renewable

sources of energy and from biological to mechanical sources of power.

In contrast to Masuda, Jones and Rifkin, Rosenbrock et al. (1981) delved into

the history of the British Industrial Revolution, and they concluded firmly that

we are not witnessing a social revolution of equivalent magnitude, because the

new information technology is not bringing about new ways of living. They

predicted that we are not entering an era when work becomes largely unnecessary,

there will be no break with the past, but will be seeing the effect of new

technology in the next 20 years as an intensification of existing tendencies,

and their extension to new areas.

I suggest that Rosenbrock may come to a different conclusion with the benefit

of hindsight of changing lifestyles, 15 years later, such as the persistent rise

in unemployment and an aging society.

Population is aging especially in developed countries and will add significantly

to a possible future lifestyle of leisure. Most nations will experience a

further rapid increase in the proportion of their population 65 years and older

by 2025. This is due to a combination of the post war baby boom and the advances

in medicine, health and hygiene technology with the availability and spread of

this information. Governments are encouraging delayed retirement whereas

businesses are seeking to reduce the size of their older workforce. The

participation rates of older men has declined rapidly over the past forty years

with the development of national retirement programmes. In many developed

countries the number of men 65 and older who remain in the workforce has fallen

below ten percent. Due in part to technological advances there are more older

people and they are leaving the workforce earlier. Thus this body of people will

contribute to the growing numbers of people with more leisure time. (Clerk 1993)

Professor Nickolas Negroponte (1996) of the MIT Media Lab, points out that in

percentage per capita it is those people under seventeen years of age and over

fifty five who are the greatest users of the Internet, and that the Internet

and other information technologies encourage democracy and global egalitarianism.

Furthermore he envisions a new generation of computers so human and intelligent

that they are thought of more as companions and colleagues rather than

mechanical aids.

Jones (1990) points out a number of elements relating to the adoption of new

technology that have no precedent in economic history and suggests that there is

a compelling case for the rapid development of policies to assist appropriate

social adjustments. He points out that manufacturing has declined as the

dominant employer and that there has been a transition to a ?service’ or post

industrial economy in which far more workers are employed in producing tangible

and intangible services than in manufacturing goods. The cost of technology has

fallen dramatically relative to the cost of human labour. Miniaturisation has

destroyed the historic relationship between the cost of labour and the cost of

technology, allowing exponential growth with insignificant labour input, which

is leading to the reduction of labour in all high volume process work. Sargent

(1994) points out that in Australia during the last decade, the rich have

become richer and the poor poorer: the top 20 per cent of households received 44

per cent of national incomes in 1982, and by 1990 this had risen to 47 per cent.

But the top 1 per cent received 11 per cent of incomes in 1982, and this rose to

21 per cent in 1990. Meanwhile unemployment continued to increase.

Jones (1990) further points out that the new technology has far greater

reliability, capacity and range than any which proceeded it. Microprocessors can

be directed to do almost anything from planning a school syllabus and conducting

psychotherapy to stamping out metal and cutting cloth. It is cheaper to replace

electronic modules than to repair them and the new technology is performing many

functions at once and generating little heat or waste and will work twenty four

hours a day. The making and servicing of much precision equipment which required

a large skilled labour force has been replaced by electronic systems that

require fewer workers.

The relationship between telecommunications and computers multiplies the power

of both, the power for instant, universal communications is unprecedented,

consequently the influence of any individual economy to control its own destiny

is reduced. All advanced capitalist nations and many third world and communist

blocks are now largely interdependent, this has led to an international division

of labour and the growth of the multinational corporations. The global economy

is rapidly taking over from individual nations.

The adoption of each new generation of technology is increasing and is rapidly

becoming cheaper than its predecessor. Technologies developed in the 1960s have

seen rapid rates of development, adoption and dissemination. Less developed

countries can now acquire the new technologies due to the rapid decrease in cost,

and the combination of their low wages and the latest technology make them

formidable competitors in the global market. Almost every area of information

based employment, tangible services and manufacturing is being profoundly

influenced by new technology.

Jones (1990) notes that few economists have addressed the many social

implications that stem from the development of science and technology. Most

economists’ thinking is shaped by the Industrial Revolution and they are unable

to consider the possibility of a radical change from the past, they give no hint

that Australia has passed a massive transition from a goods based economy to a

service base. Attempts to apply old remedies to new situations are simply futile.

Jenkins (1985) disagrees with Jones and argues on behalf of the traditional

economic model suggesting that it will continue to work well in the new era and

the facts do not support any causal relationship between automation, higher

productivity, and unemployment. He claims that it cannot be emphasised too

strongly that unemployment does not stem from the installation of new technology.

He says it is the failure to automate that risks jobs and the introduction of

new technology will increase the total number of jobs. Further, he suggests

that the primary reason for introducing new technology such as computer

controlled robots is to reduce costs and to improve product quality and that

lower costs mean lower prices. This results in increased demands for goods and

services, which in turn generates higher output and employment and profits. He

suggests that higher profits induce higher investment and research and

development expenditure whilst the domestic producers of robotics and

microelectronic based equipment increase output and employment. He sees the

greatest problem simply in the need for occupational restructure of employment,

as the need for software experts, computer programmers, technicians and

engineers are likely to sharply rise.

Rifkin (1995) like Jones believes that the old economic models are

inappropriate in the ?Third Industrial Revolution’ and describes views similar

to Jenkin’s as “? century old conventional economic wisdom” and ” ? a logic

leading to unprecedented levels of technical unemployment, a precipitous decline

in purchasing power, and the spectre of a worldwide depression.”

It is questioned whether Jenkins’ solution of re-training will be able to

replace all displaced workers. Educator Jonathon Kazol (1985) points out that

education for all but a few domestic jobs starts at the ninth grade level. And

for those, the hope of being retrained or schooled for a new job in the elite

knowledge sector is without doubt out of reach. Even if re-training and re-

education on a mass scale were undertaken, the vast numbers of dislocated

workers could not be absorbed as there will not be enough high-tech jobs

available in the automated economy of the twenty-first century.

A British Government backed study by Brady and Liff (1983) clearly supported

this view. They concluded that jobs may be created through new technology, but

it will be a very long time before the gains could offset the losses from

traditional industries.

Even the neo-classical economists continue to subscribe to traditional economic

solutions, yet they have been met with stiff opposition over the years. In Das

Kapital, Marx (McLelland 1977) predicted in 1867 that increasing the automation

of production would eliminate the worker altogether, and believed the

capitalists were digging their own graves as there would be fewer and fewer

consumers with the purchasing power to buy the products.

Many orthodox economists agreed with Marx’s view in many respects, but unlike

Marx, supported the notion of ?trickle down economics’ and said that by ?

releasing’ workers, the capitalists were providing a cheap labour pool that

could be taken up by new industries that in turn would use the surplus labour to

increase their profits that would in turn be invested in new labour saving

technology which would once again displace labour, creating an upward cycle of

prosperity and economic growth.

Such a viewpoint may have some validity in the short-term but one must consider

the longer term effects of such a cycle, it is questionable whether it could be

sustained.

Another important question is whether consumerism will continue unabated,

whether it is a normal human condition to see happiness and salvation in the

acquisition of goods and services. The word “consumption” until the present

century was steeped in violence. In its original form the term, which has both

French and English roots, meant to subdue, to destroy, to pillage. Compared

with the mid 1940s the average American is consuming twice as much now. The mass

consumption phenomena was not the inevitable result of an insatiable human

nature or a phenomenon that occurred spontaneously, quite the contrary. Business

leaders realised quite early that they needed to create the ?dissatisfied

customer’, and to make people ?want’ things that they had not previously desired

(Rifkin 1996). Nations throughout the world are starting to understand the ill

effects that production has on the ?natural’ environment, and the acquisition of

goods and services on the psyche. With more people with less money, and a trend

towards a lifestyle that emphasises quality rather than quantity, it is

questionable whether consumerism will, or is desirable, to continue.

Science and technology’s profile grew to such an extent in the early part of

this century in the United States that the supporters and proponents of

technocracy were prepared to abandon democracy, and favoured ?rule by science’

rather than ?rule by humans’ and advocated the establishment of a national body,

a technate, that would be given the power to assemble the nation’s resources and

make decisions governing production and distribution of goods and services.

The image of technology as the complete and invincible answer, has somewhat

tarnished in recent years with the number of technological accidents such as

those which occurred in nuclear power stations at Chernobl and Three Mile

Island, and threats of nuclear war and environmental degradation increasing and

coming to the fore. Yet the dream that science and technology will free humanity

from a life of drudgery continues to remains alive and vibrant, especially among

the younger generation.

During the 1930s, government officials, trade unionists, economists and

business leaders were concerned that the result of labour saving devices, rising

productivity and efficiency, was worsening the economic plight of every

industrial nation. Organised labour wished to share the gains by business, such

as increased profits and fewer workers required. They joined together, to combat

unemployment by fighting to reducing the working week and improve wages, thus

sharing the work and profits amongst the workers and providing more leisure

time. By employing more people at fewer hours, labour leaders hoped to reduce

unemployment brought on by labor-saving technology, stimulate purchasing power

and revive the economy. Clearly unions saw the problems resulting from

technological change to lie partly, in increased leisure time (Rifkin 1996).

Unemployment is steadily rising, global unemployment has now reached its highest

level since the great depression of the 1930s. More than 800 million people are

now underemployed or are unemployed in the world, while the rich are becoming

richer and the poor getting poorer. Unemployment rates among school leavers in

South Australia is as high as twenty five per cent and nine per cent for the

rest of the community, which leads one to question whether the traditional

economic model is working.

Trade unions have pursued their response to unemployment throughout the years

with wages and salaries growing and the working week reduced, for example in

the UK the working week has reduced from eighty four hours in 1820 down to

thirty eight hours in 1996 (Jones 1990).

Typical government response to unemployment has been to instigate public works

programmes and to manipulate purchasing power by tax policies that stimulate

the economy and lower tax on consumption. It can been seen in Australia that

governments no longer see this as the answer, in fact there is an opposite

approach with a strong movement for a goods and services tax, to redistribute

wealth, as proposed by the defeated Liberal Party of Andrew Peacock in 1992, and

now being re-introduced. Many job creation schemes and retraining programmes are

being abandoned by the new Australian Liberal Government of John Howard.

However the power of the workers and unions in 1996 is severely restricted. The

unions have lost the support of workers as reflected in their falling membership,

and no longer can use the threat of direct action with jobs disappearing fast.

The Liberal Government passed legislation to limit collective bargaining, with

unions power of direct action becoming even more eroded and ineffective because

of global competition and division of labour, and automation gave companies

many alternatives. Unions have been left with no option but to support re-

training, whether they believe it is the answer to unemployment or not.

Today, it seems far less likely that the public sector, the unions or the

marketplace will once again be able to rescue the economy from increasing

technological unemployment. The technological optimists continue to suggest that

new services and products resulting from the technological revolution will

generate additional employment. While this is true, the new products and

services require less workers to produce and operate, and certainly will not

counteract those made redundant through obsolete trades and professions. Direct

global marketing by way of the ?Superhighway’ the ?Internet’ and other forms of

instant telecommunications is making thousands of middle marketing employees

obsolete. For example the SA bank introduced phone banking some while ago, they

now are the first bank in South Australia to trade on the Internet

(http://www.banksa.com.au), and many rural banks are closing. Also, it has just

been announced by the electoral commission that voting by telephone will be

trialed next year, with enormous potential job loss.

The widely publicised information superhighway brings a range of products,

information and services direct to the consumer, bypassing traditional channels

of distribution and transportation. The numbers of new technical jobs created

will not compare with the millions whose jobs will become irrelevant and

redundant in the retail sectors.

Jones (1990) notes that there is a coy reticence from those who believe that

social structure and economics will continue as in the past, to identify the

mysterious new labour absorbing industry that will arise in the future to

prevent massive unemployment. Jones believes that industry ?X’ if it does

appear, will not be based on conventional economic wisdom but is likely to be in

areas where technology will have little application, he suggests it may be in

service based areas such as education, home based industry, leisure and tourism.

Despite Barry Jones predictions, most service industries are very much affected

by new technology. Education is fast becoming resource based with students in

primary, secondary, technical and tertiary levels expected to do their own

research and projects independent of class teachers with schools being networked

and teaching through video conferencing. The conventional teacher is fast

becoming obsolete, with the number of permanent teachers reducing,

There are numerous examples of workers in service industries being displaced by

technology. Shop fronts such as banking, real estate, travel and many more, are

disappearing. Small retail food outlets continue to collapse, with the growth

of supermarkets and food chains organised around computer technology, and on-

line shopping from home. Designers of all types are being superseded by CAD

computer design software. Even completely automated home computerised services

such as a hardware and software package called “Jeeves” is now available.

Business management and company directors are finding voice activated lap top

computer secretaries far more reliable and efficient than the human form.

The New Zealand Minister for Information and Technology, Hon. Maurice

Williamson MP, wrote the foreword for the paper ?How Information Technology

will change New Zealand’:

On the threshold of the twenty first century we are entering a period of change

as far reaching as any we have ever seen.

Since the industrial revolution people have had to locate themselves in large

centres where they could work with others, but now new technologies are

rendering distance unimportant. The skills that are needed in tomorrow’s society

will be those associated with information and knowledge rather than the

industrial skills of the nineteenth and twentieth centuries. Changing technology

will affect almost every aspect of our lives: how we do our jobs; how we educate

our children; how we communicate with each other and how we are entertained.

As Williamson points out, with the explosion of technologies , it is easy to

lose sight of the larger patterns that underlie them. If we look at the

fundamental ways people live, learn and work, we may gain insights about

everyday life. These insights are the basis for new technologies and new

products that are making an enormous difference in people’s lives.

Stepping back from the day-to-day research for new electronic devices, life can

be seen as being fundamentally transformed. There is development of a networked

society; a pattern of digital connections that is global, unprecedented, vital,

and exciting in the way that it propels the opportunities for entirely new

markets and leisure. As people make digital technology an integral part of the

way they live, learn, work and play, they are joining a global electronic

network that has the potential for reshaping many of our lives in the coming

decade.

In the future, technologies will play an even greater role in changing the way

people live, learn, work and play, creating a global society where we live more

comfortably; with cellular phones and other appliances that obey voice commands;

energy-efficient, economical and safe home environments monitored by digital

sensors. There will be “Smart” appliances and vehicles that anticipate our needs

and deliver service instantly. We are seeing portable communications devices

that work without wires; software intelligent agents that sort and synthesise

information in a personally tailored format; new technologies that provide

increased safety and protect our freedom, ranging from infra-red devices that

illuminate the night to microwave devices that improve radar and communications.

People are also learning more efficiently, with interactive video classrooms

that enable one-on-one attention and learning systems that remember each

student’s strengths and tailor lesson plans accordingly. There are lap-top

computers and desktop video clips that bring in-depth background on current

events with instant access to worldwide libraries and reference books with full

motion pictures.

People are working more productively, with “virtual offices” made possible by

portable communications technologies and software that allows enterprise-wide

business solutions at a fraction of the usual cost and in a shorter length of

time with massive memory available at the desktop and lap-top levels. There are

“Intelligent” photocopiers that duplicate a document and route it to a file and

simultaneous desktop video-conferencing from multiple locations, sending voice

and data simultaneously over the same communications channel.

With the explosion of leisure activities available, people play more expansively.

There are hundreds of movies available on demand at home, virtual-reality games,

a growth in the number of channels delivered by direct satellite television,

videophones that link faces with voices, interactive television for audience

participation, instant access to worldwide entertainment and travel information

and interactive telegaming with international partners (Texas Instruments 1996).

This paper has considered developments in electronic miniaturisation, robotics,

digitisation and information technology with its social implications for human

values and the future of work. It has argued that we have entering a post-modern

period and are entering a post-market era in which life will no longer be

structured around work in the traditional sense, there will be greater freedom

and independent living, paid employment will be de-emphasised and our lifestyle

will be leisure orientated.

I have argued that the social goal of full employment in the traditional sense

is no longer appropriate, necessary or even possible, that both government and

society will need to recognise the effects of technology on social structure and

re-organise resources to be distributed more equally if extreme social unrest,

inequity, trauma and possible civil disruption is to be avoided.

I foresee a scenario of a sustainable integrated global community in which

there will be some form of barter but cash will be largely eliminated, money

will be ?virtual’. A minimal amount of people will be involved and enjoy some

forms of high tech activity, while the vast majority will have a vocation that

is essentially creative and enjoyable perhaps involving the arts and music with

a spirituality that involves deep respect and care for the natural world with

new forms of individual and group interaction. There will be minimal forms of

world central democratic government. Vast forms of infrastructure will no longer

be required as citizens will largely be technologically independent. Most

communication and interaction will be instant and conducted from home, office or

public terminal. There will be new forms and ways of living, new family

structures that may consist of larger and smaller groups. A comfortable,

pleasurable and leisure based lifestyle in which all the essentials and wants

will be automatically provided through the processes of the largely self-

sustaining and self evolving technology.

Rifkin (1995) has a similar view, and concludes that he believes the road to a

near-workerless economy is within sight and that road could head for a safe

haven or a terrible abyss, it all depends on how well civilisation prepares

for the post-market era. He too is optimistic and suggests that the end of work

could signal the beginning of a great social transformation, a rebirth in the

human spirit.

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