

# Whose Digital Future? Players and Bystanders

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Tony Stevenson\*

*Social unrest is erupting on a new front, at the digital divide. The main players in the globalisation of the economy confront the bystanders in a battle of rhetoric and statistics. They argue over whether the new digital economy, driven by the Internet, is widening the gap in wealth and knowledge. The relationship between capital and democracy is examined. From a local-global perspective the questions are: how can the bystanders participate in economy and technology; if connection is necessary for sharing knowledge, is it sufficient; and if not, what kind of futures do the bystanders need to create? Alternative futures are suggested and issues raised.*

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\* Tony Stevenson, President, World Futures Studies Federation, c/- The Noosa Institute for the Future, P.O. Box 188, Noosa Heads 4567, Australia. E-mail: [tony.stevenson@WorldFutures.org](mailto:tony.stevenson@WorldFutures.org)

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Yet another steam vent of a grumbling social volcano hissed at police in the streets of Melbourne last September (2000). Protesters had tried to prevent Microsoft's Bill Gates and other doyens of the digital age from conferring and deal making over the short-term futures of global capital.

At the time, the United States' dollar was soaring against most other currencies, flexing the economic muscles of a singular superpower. And the world was recovering from the inglorious crash of a gluttonous stock-market splurge on electronic equities.

Secured inside Melbourne's Crown casino at the World Economic Forum, digital-age dark suits called the protesters hypocrites. The protesters, they said, were using mobile phones and Internet services to organise against the very companies claiming to be "empowering" society and "alleviating world poverty" with their digital products.

At least one U.S. hard-wired executive said the success of the digitally-driven U.S. economy should be the living example that free trade and investment assures economic growth - as if other nations have the same clout. He also asserted that the linking of trade to environmental issues by the protesters is not rational. Trade should be considered within its own, separate field.

But the beanie-clad protesters would have nothing of an exclusionary, economic rationalism that strips trade and investment of its context. Their story portrays global capital as the villain growing fatter at the expense of the poor, a declining bourgeois and the natural ecology. To them the unquestioned benefits of the digital age are not equally available.

The TV images from Melbourne symbolised the re-emergence of the classic struggle between capital and democracy. This time the battlefield was the inequity of global capital, not only the environment.

The "world chamber of commerce" had invited government leaders to Melbourne, some of them democratically elected representatives. They had also invited a token handful of civil society organisations inside to raise the issues. But most of the concerned citizens were undemocratically kept outside this private-public power alliance by platoons of publicly funded state police.

What follows is a brief examination of the newly wired world from a local-global perspective. It anticipates the futures of the digital divide claimed to be widening with the neo-liberalisation of global trade and investment. Some local examples will be downloaded from the contemporary Australian experience.

In questioning the future, this study asks:

- how can the digital bystanders join in the main game of economy and technology;
- if connection is necessary for sharing knowledge in the global future, is it sufficient; and
- if not, what form of futures do the bystanders need to create in order to be viable players?

### *Social Splintering*

After Melbourne, some protesters left immediately for Sydney. They joined other colleagues and indigenous Australians to decry one of the most recent, prominent manifestations of the privatisation of sport, the 2000 Olympics - pumped up by an alliance between brand-name commerce and the advertising media. The massive Olympic infrastructure had been provided by Australian taxpayers at a time of declining investment in research and development.

Ironically many protesters wore footwear allegedly made by exploited labour. But it is hard to avoid products made by the many thousands of enslaved children. Most brands have been made at their cost, and their misery is subsidising the sponsorship of an elite handful of sporting heroes.

The protests in Melbourne and Sydney attracted international shock troops already trained on the streets of Seattle, Davos and Bangkok. Some were hardline leftists, some fascists. Yet others sought to preserve democracy from what they see as predatory capital.

As if in sympathy during the Melbourne event, truck drivers in Europe had taken to the highways to blockade oil refineries in protest against higher fuel prices. And in the U.S., student sit-ins had earlier protested sweatshop labour, university contracts with global capital and the possible inhumane futures of biotechnology and genetic engineering.

It is no surprise to see the social disquiet. There has been a confluence of globalisation, new technologies, market economics and a mentality of corporatisation and privatisation. At the same time, politicians have lost public credibility and are suspected of being in league with big money.

Democracy is being tested by this heady mix that includes its proclaimed champion, the Internet.

This worldwide change has imposed costs even in industrialised countries. Livelihoods have been destroyed, education and health ser-

vices slashed, local services removed from rural areas and primary producers unable to get reasonable prices for their produce. Within organisations, employees have lost jobs. Other employees have been casualised, task teams dissolved and institutional memories erased. Family and social relations have been reordered. Yet executives were paying themselves obscenely obese salaries.

The consequences of private short-term gain appear to promise longer-term, public and individual loss. The professed leader of democracy, the U.S., demands trade rules that seem set to ensure its hegemony, as if to mock democracy.

The catch cry is a "new" economy. While globalisation and openness can be a worthy cause, it becomes obvious that widespread social learning is needed to deal with the digitisation of the economy. Without learning or government intervention, a continuing struggle seems assured.

No longer are physical products valued as highly as virtuality, image and brand. Public information is fast being commoditised and privately held in the commercialisation of cyberspace.

A battle of symbols, rhetoric and statistics, has already taken to the streets and to many a mind. The main players and the bystanders argue over whether there is a widening of the gap in wealth, information and knowledge.

### *Balancing Act*

Dare we venture further into the future without seriously anticipating our journeys, for fear the world will wobble fitfully on its axis?

Is our spinning sphere sprouting a bias on its crust, swollen from the stockpiled burden of consumption, including digital hardware, by those with wealth, power and fame?

Or will the wobble worsen under the unequal distribution of the earth's people, or both?

As we all hurtle spacewards towards uncertain futures, a post-industrial spider diligently spins a seemingly endless web of digital code around the globe. Some see the Internet as a web of gold. Yet others see it as a silver snare for unsuspecting consumers.

The Internet interconnects an estimated 1.5 billion pages, and counting. Its traffic and its web-site nodes are thickest where consumer materialism is most dense and thinnest where population is most dense -

where the world's per-capita income seems to be unevenly trickling down.

If we could inject a brightly-coloured dye into the veins of the Internet to monitor its myriad signal flows, we would be blinded by its brilliance over the U.S. It would be almost as bright over other developed, industrialised countries. But there would be barely a flicker over the Arab states, and a little more brightness over South Asia and sub-Saharan Africa. It would progressively become brighter over Eastern Europe, South East Asia, South and Central America and East Asia.

Thus digital convergence of telecommunications and computing becomes a digital divide. The issue of information access is also a matter of economics.

The picture behind the newest form of globalism is complex, with many layers of meaning.

### *Disconnected Spectators*

Most of the passengers aboard this planet already stand outside the new economy being force-fed by the engines of corporate global capital. In a double bind, they are locked out of the Internet, the innovation driving a globalised market economy.

And because of globalisation, even people living far from the centres of wealth and power are bearing some of the costs of accumulation. This became clear after the 1998 Asian crisis. Money had to be channelled from health and education in developing countries to cover increased interest payments under a "restructuring" of their victimised economies at the insistence of the wealthy lender countries that bailed them out.

The bystanders are largely those who lack income and education, even where infrastructure is in place.

For example in Australia, a technologically-optimistic, industrialised country, a recent study (Mitchell 2000) for the telecommunications network, Telstra, found that lack of income and higher education inhibits access to the Internet.

It does not seem to matter how many satellites are rocketed into the sky or how much cable is strung up past their homes. In Australia, Internet take-up rates are frighteningly lower in provincial or regional areas — from a half to a third that in metropolitan areas, and even some remote rural areas. Provincial areas have clusters of people with relatively lower incomes and levels of education.

What chance, then, for someone living in Uganda?

*Counting the Difference*

On the global scale, while the United Nations Development Program (UNDP) agrees that economic globalisation offers great opportunities for human advance, it claims these will be realised only with stronger governance. It calls for a human face to globalisation. The relentless pressures of global competition are squeezing out care, the invisible heart of human development. When the profit motives of market players get out of hand, UNDP asserts, they challenge people's ethics and sacrifice respect for justice and human rights (Human Development Report 1999).

UNDP demands that the opportunities and benefits of economic globalisation be shared more widely, including access to the Internet. The change being driven by the new information and communications technologies may be polarising the world into the connected and isolated, because income buys access to the Internet.

Not everyone accepts UNDP's statistical analysis that unveils an unequal share of newly aggregated wealth from globalised free trade and investment. Its critics have led to the formation of a United Nations commission to investigate the agency's analysis. The controversy revolves on claims that the gap between rich and poor is widening. It seems to depend on whether averages of aggregated economic growth fairly depict the distribution patterns of any new wealth to individuals worldwide.

But economists concern themselves with prices and leave matters of distribution to others.

UNDP accepts that competitive markets may best guarantee efficiency. But it questions whether equity is necessarily assured, as evidenced most starkly in losers such as Madagascar, Niger, the Russian Federation, Tajikistan and Venezuela.

But efficiency could be a code word for unequal distribution. And efficiency for whom — the shareholders? In the mind of United States economist, Lester (1996: 242), capitalism sees efficiency as inequality in purchasing power and "survival of the fittest".

Until the statisticians resolve whether inequity is trending up or down, the present discrepancies are clearly disturbing. They certainly justify heeding the calls for new forms of regulation and governance or for other checks and balances to ensure the benefits of globalisation in its widest sense while ameliorating the social risks.

Meanwhile, the present inequity at the extremes is well illustrated in a UNDP example. An average Bangladeshi needs more than eight year's income to buy a computer, whereas the average American would need

just one month's wage. Education is a ticket to the networked high society, the agency says. Men and young people dominate its use. Almost 80 percent of web sites are predominantly in English, a language spoken by fewer than ten percent of the world's people.

More than 90 percent of all Internet users live in the richest 20 percent of the world. Much less than one percent of users can be found among the poorest 20 percent.

### *Reorienting North and South*

Once, we could simply slice the world into rich and poor according to whether people lived north or south of the equator, in an inexact but symbolic way. Now numerous zig-zag slices intersect countries, in a complex mosaic. There are desperate poor in the U.S., just as there are egregiously rich, standing to gain most from economic globalisation, in what have been called second- and third-world countries.

Sliced in this way, the world has a new division into what Australian journalist, Max Walsh (2000), calls the "internationalists and the rest". He does not agree that the rich are getting richer while the poor are getting poorer. Instead, he argues those at the top end of the income scale are increasing their wealth both in relative and absolute terms somewhat faster than people further down.

It is difficult to ignore the wealth gap. Regular airline "customers" can hardly fail to notice that economy class service is getting leaner and the seats smaller. Business class gets plusher. The wider seats now adjust in five directions. Yet more people can now afford to fly, but on "no-frills" airlines.

If UNDP's analysis is correct, the gap over the last four decades widened by about 250 percent, to a ratio of 74:1 in 1997 (up from 60:1 in 1990 and 30:1 in 1960).

Walsh's point is that we face a bifurcation by way of the Internet where those with the technology and financial wherewithal will increasingly live in an open international environment. He writes in the context of arguing that government media regulation should "not override the technological forces shaping the 21st century". Australia must not miss out on such "evolution".

His selective perception ignores the tremendous recent increase in corporate mergers around the world. He fails to anticipate whether predatory global capitalism will eventually deny local participation for a ma-

jority of countries in any such internationalist evolution.

When currency exchange rates are favourable to globally powerful capital, it targets less powerful Australian firms for global "industry consolidation". This sucks out local ownership, skills and knowledge to the top of the social superstructure, leaving behind a bigger local vacuum.

Similarly on a national scale, powerful capital within Australia has effectively preyed on key industries such as banking and retailing, in a "rationalisation" of industries tending towards oligopoly, if not monopoly. Why should we expect open internationalisation not to violate local ownership of successful enterprises, draining target countries and provincial localities of resources for forging their futures? Unless, of course, one lives in one of the very rich countries!

Such selective perception is in fact not always global or internationalist. It too often stops at the home border. It is either not aware or fails to recognise that half the world has never used a telephone, let alone a computer connected by a modem and running on expensive software.

The World Bank has found it necessary to do something, and its president, James Wolfensohn has spoken out about the need to redress inequities. Wolfensohn (Hiscock 2000) recently appealed to Australia to use distance learning to help poor countries build up their governments and social institutions, to help the 4.8 billion poor. With the Bill and Melody Gates Foundation, the World Bank sponsors time on CNN television to tell good news stories about projects helping the developing world catch up.

Vandana Shiva (2000), speaking in Melbourne, is not sure that such projects are necessarily helpful. If an Indian rural village does scratch together enough to buy a computer, or is given one, to help access market prices, local farmers still cannot improve the prices that are controlled by powerful vested interests.

With the ruling economy bent on privatisation the very world has become a commodity. Local resources are bought out. Water is being privatised in the same way mining has privatised mineral resources.

And without adequate education, can local farmers in far-flung locations usefully navigate and interpret the growing knowledge bank, especially as it becomes privatised? How can they afford helpful information to improve production, heal their ills, educate their children and change their livelihood?

Even if a village computer would help, the scale of the task for connecting the developing world is frighteningly huge. Is enough being done?



Is there the will? Can it turn back the tide that leaves behind a desert of dispossession? Are the scattered Internet projects merely anecdotal - token attempts, further examples of high enthusiasm to assuage some guilt or to paste over the true scale of an intractable problem?

### *Knowledge as Commodity*

People denied full, positive participation in the global economy and access to the Internet, face the future as mere distant spectators of the emergent new knowledge economy, as knowledge becomes the fashionable, new commodity. The path to knowledge, education, is being privatised despite the Internet's potential for open learning.

The race to lay claim to knowledge, evident with biotechnology, is part of the march of economic globalisation. Commercial sponsorship of research is threatening disinterested inquiry, the paramount value of higher education (Press & Washburn 2000) where much, new knowledge is generated. Universities in the United States and elsewhere are becoming increasingly subservient to vested corporate interests that provide research funding in return for ownership of new intellectual capital.

In Australia, the Group of Eight (Go8) has formed around the country's more traditional, research-intensive universities. In competing for the corporate research dollar, the elite Go8 seeks to promote "efficiency" in the new knowledge economy, while forcing most students at newer or less well endowed universities to become bystanders at the generation of knowledge ("The necessity..." 2000).

The Internet certainly can help build a bridge to new knowledge, but so long as the intellectual property is held as commercial-in-confidence, the Internet's potential for empowerment, the Microsoft mission, is seriously compromised. Even if remote farmers in developing Africa can pool resources for a mobile phone connection to the Internet, where do they find enough to buy private knowledge? The digital divide could become the knowledge canyon.

### *High Hype*

Despite the digital wedge, the hyperbolic enthusiasm surrounding the Internet continues with a ferocious intensity. This *hype* is most obvious in the consumer West. But a quick glance of the daily advertising media in newly industrialising countries shows how far it has spread. It

would make an interesting historical analysis to see whether any other new technology has ever been flattered so much by fashion and capital.

There is little doubt that the Internet and the World Wide Web reasonably join the telephone, fax and mobile phone as among the most successful and helpful 20th-century technologies. They are certainly worthy of some enthusiasm, if not for their claims of universal utility.

But enthusiasm for new technology can be unjustified as seen with the failed satellite phone. Its marketing company, Iridium, was forced into bankruptcy after pumping the hot air of consumer desire into a very specialised application at too high a price.

It remains to be seen how sound is the current hype engulfing the emerging wireless applications protocol (WAP) for joining small, handheld devices to the global digital network. It is touted as a great benefit to remote locales in developing countries. WAP proponents have recently backed off a little, given a slow uptake in richer countries, perhaps because of the awkwardness of fingering a relatively small keyboard. Its high initial price may have been a factor, too.

Still the Internet hype persists, driven by unprecedented consumer marketing, even though empirically it has yet to live up to all the hopes. For example, it has not slashed costs and boosted revenue in the media industry where the experiment has been an expensive disappointment, according to *The Economist*. The magazine quotes Cynthia Brumfield (2000), publisher of *Broadband Intelligence*, who suggests a "chicken-and-egg problem". Because the content is not there, people are not rushing to get the connection; but without the connection, there is no market for the content.

A *Doonesbury* cartoon recently caricatured the falsely optimist demand for "tiny, jerky videos that never play" (Trudeau 2000). While broadband transmission could soon enhance visual fidelity for those with the money, it could take many years to reach the wider world.

The hype for e-commerce over the Internet could still turn out to be as exuberant as that which made *dot.com* stock prices soar, only to see them crash in the face of financial reality. E-tailing is still unconvincingly profitable.

While booksellers have invented an imaginative service on the Internet, their financial performance is dismal to date. Is this because e-tailing is nothing more than a conventional warehousing operation demanding physical delivery? After all, the network is little more than a substitute for the telephone or personal appearance as media of consumer communication.

Pornography, gambling and financial services have won some initial, economic success. But even electronic banking is unconvincing financially. A survey by Cyber Dialogue shows that 3.2 million people in the U.S. signed up for online banking in the 12 months to July 1999 but 3.1 million closed their accounts. Whereas 16 percent of American equity trades are now made online, still only three percent of US families bank online ("Only a few..." 2000).

Is the current Internet age still really the information-technology (IT) age? Is it little more than a boom for the manufacture and marketing of computer hardware and Internet software?

It seems to be the case. In 1998, 20.6 personal computer CPUs became obsolete in the United States alone, according to the U.S. National recycling Coalition (Cuthbertson 2000). This number is expected to rise to 300 million by 2004 and may top 500 million by 2007, posing a serious waste problem.

It took IT two decades in the United States to overcome the productivity paradox. The massive investment in IT has only just begun to see a reasonable return in productivity. It took some time before an IT application, the Internet, could be seen as a tool for cutting bureaucracy and for improving logistics and information flows in manufacturing and service delivery.

New technology has a lead-time before its uses, not always seen at the time of invention, become apparent and its full range of applications is appropriately developed.

It may be still too early to see how policy and social processes will develop to fully enlist a mature Internet — connecting the Web — in the cause of society and to ensure equitable access to knowledge for medical, security, educational and other humane applications.

Meanwhile, the hype over the Internet seems to be closely connected to the dominant orthodoxy. This asserts that globalisation of the economy is both widely beneficial and inevitable, and that the global mediator, the Internet, will help bring its proclaimed social benefits.

### *Localisation*

Those who challenge the orthodoxy believe global capital has forced a consumer lifestyle that is ecologically unsustainable and humanly degrading. One alternative is a community that produces locally what it consumes.

British antiglobalist, Helena Norbert-Hodge (2000), points to an apparent inefficiency with the example of Dutch butter being sold in Nairobi at half the price of Kenyan butter. This might deliver lower prices, but the practice has significant costs. It is not environmentally sustainable because of the unnecessary energy spent in long-distance transport. Further, it disadvantages local Kenyan farmers. At her home in Devonshire, Norbert-Hodge says, local butter costs five times more than the New Zealand import from the other side of the world.

She argues that economic globalisation is reversible and she readily offers worldwide examples of shifts from global to local enterprise.

Globalisation is not new. It crested another wave about a century ago and was overturned by a depression.

Meanwhile the chord of a communitarian vision of the future, recently strummed by the late futurist, Robert Theobald, has resonated fairly widely in Australia. Predictably, it harmonises with wishful *new-age* thinking, but it also appeals to people whose personal vision for living is at odds with the received vision of the corporatised sphere in which they work.

In Australia there are people who have opted to change their way of living and economic circumstances. A current, local television serial, *Seachange*, has become popular for its portrayal of an alternative lifestyle for mainstream people who have fled the city rat race. The word *seachange* has come to mean a change to a quieter, personally freer, non-urban community life.

There is growing interest in my local community near Noosa Heads, Australia, to become more locally self-sufficient, to buy local, organic food even if it costs a little more. And there is demand for alternative energy and transport. Admittedly this is all very well for an industrialised country. Australia has a gross domestic product that makes eco-goods and services affordable for many.

### *Local-global Awareness*

While local communities seek to reverse economic globalisation, not all are necessarily turning a blind eye to other aspects of globalism. They accept that distant local communities, even in vastly different cultures, have much to learn from each other, and are keen to make local-global connections.

Ingrid Burkett (1996), an Australian researcher, teacher and activist

in community development, believes the Internet brings an opportunity for mediating local-global cooperation among local authorities, non-government organisations and local community groups. This helps explore community development issues by making use of long-distance connections.

Her ideas are based on a belief that local communities are inherently connected to global processes. Any efforts to make a difference in various world crises need action both locally and globally. Such partnering across oceans differs from the "sister city" programs that usually favour trade and business, often neglecting a broader social agenda.

By exchanging people, ideas and experiences, as well as technology, industrialised countries can help alleviate poverty and enhance human livelihood elsewhere. And developing countries have novel ways of helping address unemployment in industrialised countries, as well as youth suicide, suburban isolation and protection of public and private spaces. Here the Internet can be invaluable.

My local community is now investigating a local-global, co-development project connecting communities on Negros Island, in the Philippines, with the Noosa hinterland in Australia.

A personal visit to Filipino communities on Negros can challenge Westerners to move head and heart beyond the comforts and assumptions of middle-class, industrialised security. In a local fishing community on Negros the Internet is an abstraction, and so too is globalisation in its many forms.

Here the implications of economic globalisation indeed become concrete when the livelihood of Filipino fisherfolk disappears before their eyes, in much less than a lifetime. The big commercial boats, with orders for tourist restaurants in Manila and other well-set tables abroad, can net in just one night what a local family caught on a line and hook in a whole year, just a decade ago.

The boat owners have invested in technology, capital and weapons way beyond the reach of such local communities. Capital has ignored the fisherfolk, leaving their plight to the limited resources of civil society, if they are lucky.

To this day, still other peasants in South East Asia find they can barely afford cooking oil or fuel for a tricycle. Such is the legacy of self-centred speculation by foreign currency gamblers that brought the so-called Asian crisis a couple of years ago. Even the middle class still hurts.

While open global trade and investment may boost certain national economic aggregates, although not in all countries, new wealth certainly

fails to trickle down to most of the already impoverished people bearing the costs of the reigning, commercial orthodoxy. The aggregate indicators do bring the benefits of new infrastructure, but they do not always adequately reflect the distribution of new wealth nor improve social justice.

### *Freedom or Control?*

The idea that human development lies in some kind of commodity indicator, such as GDP, is seen by economist, Amartya Sen (1999), as a vulgarisation of the original vision that developed economics. He seeks to reclaim that vision within a wider context which values human life and liberty. Where there is no democratic freedom, poverty has been most entrenched.

Does this mean the Internet will empower and deliver personal freedom to reduce poverty in countries with no democratic governments? Or will people living in poverty in non-democratic countries miss out on both economic improvement and access to the Internet?

In fact, it has the potential to do both. The demonstrators in Melbourne and Seattle reached for the very digital technologies centralising the control of capital in order to decentralise social power.

Like other communications technologies, the Internet has the potential to both centralise and decentralise power. The question is: How can policy be formulated to mediate justice between public and private, between community and capital?

The wired generation, at play-station controls in their living rooms, can and do apply their digital nous to zapping the very economic and technological institutions — the preferred targets of today's anarchist hackers. The hackers test their skills on the big institutions claiming to deliver and protect their freedom — such as the Pentagon, the World Bank and the transnational corporations.

However, while many people feel empowered by the Internet, are they being lured under the control of the consumer-oriented global market?

Ellen Ullman (2000) believes the near-complete commercialisation of the Web in the past few years has sought to convince the individual that the Internet brings change in the purest form of self, the equivalent of freedom. She argues there has been a single-minded attempt to isolate the individual within a sea of economic activity; the mythology of

the Internet is set to ultimately privatise society.

Ullman says “disintermediation” has removed the expert intermediaries, agents, brokers and middlemen. The Internet is no longer a zone of personal freedoms, a pleasant diversion of what we used to call “real” life. It is a marketplace that is changing the nature of real life itself.

### *Artificial Reality*

But what is real any more, given the virtuality of cyberspace and the advance towards artificial intelligence?

Researchers in Switzerland (Krieger, Billeter & Keller 2000) have taught robots community spirit, training them to behave like ants. The robots are programmed with some simple rules used by ants to cooperate in searching for food. In future such robots could work in teams to explore space way beyond the human realm.

News of cooperative robots came as French scientists (Lipson & Pollack 2000) recently announced they had made the first robot to evolve and replicate without human intervention.

Will such robots eventually turn to an adversarial form of politics like their human creators?

It is interesting that futurists at the University of Hawaii identified the politicisation of robots two decades ago when they came up with “rights for robots” as an emerging issue.

Robots could well become competitive with humans. Bill Joy (2000) of Sun Microsystems’ recently popularised the disarming possibility that the future may soon not need humans. Robots with artificial intelligence could make us redundant.

We could well ask: What about responsibilities for robots?

Joy said the eventual extension of digital technologies into convergence with others - robotics, genetic engineering and nanotechnology - could make humans an endangered species.

There are estimates that artificial intelligence could see machines match human brainpower by 2030 (Broderick 2000). If and when that happens, does it mean that the current inequities in economy and technology throughout our beautiful blue planet would be no longer a human issue? Or could the threat of a competitive new species force much greater human collaboration than is now the case?

*Ethics of the Artificial*

Joy said that as a builder of software he could imagine the day when he could be morally obliged to stop work. To him the choice is between the pursuit of unrestricted and undirected growth through science and technology and the clear accompanying dangers.

Meanwhile, co-founder of the Web, Robert Cailliau (2000) calls for regulation of cyberspace through a user's licence and a worldwide legal framework.

Thurow (1996: 254-261) thinks conservatives have no interest in the future. It is left to the market. Utopian visions belong to the left and are often unachievable or unworkable. But without a compelling vision of the future, he believes social and economic paralysis sets in.

If inequality continues to rise and a large majority experiences falling, real income, Thurow (1996: 268) says it is difficult to anticipate what will happen. If capitalism does not deliver real wage rises as the economic pie expands it will not long hold the political allegiance of the majority of the people. Democratic politics needs to remedy the malaise or it too will be discredited.

To do this, government may have to review its alliance with capital. Perhaps it needs to give visionary leadership.

What futures, therefore?

*Alternative Future Worlds*

The Internet suggests visions of our futures from many perspectives - the anarchic, the capitalist, the socialist and the communitarian among them.

A prominent vision is a truly *wired world*. The global economy would have marched further into the digital age. Exuberance for technology would have transcended the initial surge and the dive on the dot.com market.

Transnational corporations would rely on the extended Internet to further avoid national scrutiny. And as radio transmission replaces fixed lines, it could become the *wireless world*.

As the wealth and knowledge gap widens we could have first-class and economy-class wireless networks. An easily accessible, high fidelity connection for the elite, and a crowded and congested network for the bystanders - traffic jams on the superhighway!

And will the massive electromagnetic irradiation of the biosphere



eventually wrap a cover of toxic static around the planet?

In either a wired or wireless world we would need to heed the present warning of neuroscientist, Susan Greenfield (2000). She fears the standardisation of visual images in digital networks could destroy the plasticity of the human brain.

Thus, a decline in human imagination becomes a serious emerging issue.

But capital is rarely interested in the longer-term consequences of its endeavours. Nor is it keen to help create the future.

As Thurow (1996: 295) implores, in an era of man-made brainpower industries, the purpose of government is clear. It should represent the interest of the future to the present. It should be making the investments that capitalism cannot or will not make because it has too short term a horizon. But government is doing exactly the opposite, he argues. It is borrowing from the funds that could be used for investments that improve the future to raise today's consumption for today's citizens.

In a knowledge economy, as opposed to a knowledge society, communities with no universities and research centres would be seriously marginalised. If they could afford access to private knowledge banks they would become merely obedient or disgruntled consumers. If not, they would become impoverished bystanders, relegated to providing recreation and other services to the privileged.

Eventually globalised commercialisation could deny the majority of its customers their purchasing power. Unless, of course, the confluence of digital communications with nanotechnology and robotics renders humans redundant first.

It is not only artificial intelligence that threatens humanity. A new botany described by Amory B. Lovins and L. Hunter Lovins (2000) aligns the development of plants with their economy, not evolution. The fittest not the fittest survive. Unintended consequences appear only later when they cannot be fixed.

The time would have come when our tools and our artificially contrived environment are our masters rather than the converse.

And on the way to artificiality, could we see a virtual extension into a *weird world* analogous to the interactive television programs, such as the British Big Brother? In an orgy of voyeurism and surveillance, the show's viewers aged 16 to 35 are invited to predict which of ten people living in one house during the series will next be forced to leave the house. Instead of the learned cooperation of the ant-thinking robots, we could see a mediated rise in competitive thinking.

This is another example of a generational gap already surfacing in schools where the cyberkids inhabit a different head space from their older, uncool teachers.

And if the cool cyberkids get smarter with new digital toys, a plague of anarchy could see a *wild world* emerge, taking out tradition and institutions alike.

Just maybe the backlash to all this could grow beyond today's street protests and cyberhacking. Aided by the Internet a stronger stand could be built against commercialisation on a global scale. If so, this could see a clean-green world of the Luddite and the vegan, longing for a return to personal contact.

Or could knowledge be used with wisdom to see a *wise world*? One where network connections would enable a more compassionate mix of local and global activity — where technology is used appropriately in the service of all humanity.

We may need to understand more about the people factors: how we interact, what helps us learn and create. The big revolutions of history have come when we have changed our ways of thinking rather than our technology.

As Theodore Zeldin (1998: 79) has said, where technology can bring about a fundamental shift in our view of the future is by training us to cope with failure and to get beyond an over-simple expectation of success. So far we have thought of technology in terms of gadgets which work. But it has become obvious that all technology can have bad as well as good results, bring unexpected disasters as well as benefits. The time-saving car and the noisy, polluted, traffic-jammed city are obvious examples.

It might be too much to expect a utopian result. More likely, we would see some combination of all these worlds. Then the question is, which one predominates?

If the new knowledge economy turns into a knowledge society, or even a wise, human community, we would have learned how to contend with the opportunities and threats of globalisation and unfettered technology. The blood would be flowing through the veins of the digital, global web more evenly. The world would avoid a wild wobble on its axis.

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