*Essay*

# New Media and the Futures of Society*

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*Summary*

There is general optimism and enthusiasm, often hyperbolic, for the emerging Net-the World Wide Web mediated by the Internet - and the way it will change society. But the nature of such change is uncertain. This paper critically addresses two keynote questions mainly from a social perspective: (1) Will people-to-people interactivity be possible with a range of data, text, graphics, animated images, sound and full-colour, full-motion video; and (2) What will be the consequences of the Net for people, organisations and communities?

Two scenarios are possible: the 'information society' with the industrialised commodification of information in a technological *cybermarket*, a global *cyberfantasy* video game; and a 'communicative society' where the Net empowers collaborative community development, and human creativity and well-being. It is still too early to tell which future will emerge. It could be a combination of both.

The introduction of new technologies in the past has shown that the uses and value of the new technology can turn out to be different from what was expected. And new communications technologies, for example printing, have had paradoxical effects, capable of centralising and decentralising at the same time. With IT, the paradox has been that increased investment in new technology has seen productivity, at least until recently, stagnate rather than increase, as expected. It is difficult to fathom the reason for this, since the relationship between technology and society is complex and one of mutual adjustment.

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But, it appears that successful early adoption and social acceptance require, at least, unlearning old habits and relearning new ways what we would now call retraining.

These problems are characterised by the primacy given to the technology (hardware and software) as a tool— the technological infrastructure - over the social ( and cultural ) infrastructure. We too often take the technology out of its context (the social infrastructure ) which is relatively less visible, since it represents organisational and sensemaking processes, and often tacit meaning. Similarly, we prioritise technological invention over social invention - social technologies which again are relatively less visible than hardware.

The emerging Net demands wise, ethical mindsets leading to policy decisions which ensure that it serves future personal, organisational and community well-being. The society which decides to focus on cultural and social infrastructure as opportunities for commercial and collaborative community development will distinguish itself from the many others which are still competitively rushing towards some technology-first utopia.

Soon after IBM's Big Blue supercomputer defeated a human chess grandmaster, Garry Kasparov, earlier this year, another colour-coded non-human computing champion, Option Red, made digital history in the United States. It was the world's first *teraflop* processor, that is, one capable of more than one trillion $(1012)^{10^{12}}$ operations per second. By the time it had gone online, Option Red actually had achieved a rate of 1.8 trillion operations per second, and at least one newspaper[1] had proclaimed it more powerful than Einstein's brain.

The same newspaper, writing of the so-called 'Father of the Web', Robert Cailliau[2], reported him as prophesying why the World Wide Web(Web) 'will have a greater impact than the printing press', how it 'will revolutionise education' and why 'non-Interneters will fall behind in the future'. This paper will critically appraise the social and, to a much lesser extent, the cultural nature of this much-publicised impact in terms of the Web and its mediator, the Internet, which together represent the most significant of the new media — the Net. In fact, the Net, taken to its ultimate extension represents not just the Internet and the Web, but everything else connected to it — the biggest artefact yet contrived by humanity.

The Internet, which made the global reach of the Web possible, was the 'smart' prodigy of a marriage between computing and telecommunications, an infant electronic network now surely poised to change society locally and globally, in what way we still can not be certain. It is therefore fascinating to speculate on what offspring will issue from any future partnership between developing *hypermedia* networks within and beyond the Net and the emerging

supercomputers, now that the latter have become teraflop processors. The first keynote question of the paper is technological, at least it is about hardware ( and related software): Will it be possible on the Net to achieve complex interchange of data, text, graphics, animated images, sound and full-colour, full-motion vide, interactively?

### *Towards and Interactive Digital Television*

Interactivity is the key. While the Web is certainly an impressive information reservoir which can be mined via the Internet and in real time for hyperlinked multimedia information, it is still relatively static. It is little more than a huge office filing cabinet or virtual library with relatively low user-to-user participation, as opposed to one-way use. It is more passive than active. Admittedly, unlike a filing cabinet, the Web contains more than text and illustrations identified with a simple index; the Web has many pages, in many lands, often enhanced with sound and relatively slow-moving images. Unlike a library, these pages can be found in nested layers of cyberspace with can be interrogated by software-driven search engines. In fact, one contemporary use of conventional libraries is for people without easy access to computers at work or home to visit them in order to access the Web via the Internet.

The Web, mediated via the Internet - the Net - , permits interactivity between a person and information, and in a limited way among multiple media, but the resulting interactivity between and among people is restricted to online, real-time chat shows, in text. On the Net it is not yet possible to extensively use full-colour moving images, let alone have people usefully interact with them. The storage and transmission capacities are still relatively low in terms of both memory and capacity (bandwidth), frustrating the potential for teraflop processors. Neither is it possible for a team of producers — or *prosumers*, as Alvin Toffler called them because they both produce and consume — working in different locations, to interactively and collaboratively create and view, with ease, a full-motion audiovisual presentation. In other words, the notion of Interactive Digital Television — a combined global production studio and viewing room for literature, artwork, music and movies - is not yet a workable medium for widespread public use. It is much more than the new-born Web TV, which again is still not people-to-people interactive.

### *A Cybermarket?*

If and when such a mammoth *cyber-Hollywood* surrounds much of the planet,

and soars beyond two dimensions, then a compelling, even frightening, set of virtual realities will have replaced traditional living with a *cyberfantasy*. For that is the hi-tech nirvana which certain of today's determined technocarts have in their sights. While the Net may be one of the most, if not the most, prominent and innovative of human contrivances, restricted primarily to users in the industrialised world, it could be also the most hyperbolical of new media. We will have to wait for the future.

While we are waiting, for whatever it may be, the information and communications industries, in league with the entertainment and advertising industries, are seduced by the rhetoric and have their eyes open for business opportunities from the Net, especially as a medium for video games and commercial advertising. There is also business enthusiasm for potential digital commerce: trading globally across the Net and arranging transport and finance electronically. In this form, the Net is engendering a global *cybermarket.*

### *Society and Cultural Change*

Fanning this enthusiasm are terabytes of textual, technological optimism reported in specialist sections dedicated to computers and their networking in traditional media, such as newspapers and magazines, not to mention the audio-visual coverage. The heroes include Microsoft, Sun, Intel, Samsung, NEC and other makers of hardware and software. Too often this digital-marketplace *hype* may have diverted public curiosity (perhaps mesmerised it) from the second keynote question, about the social and cultural context in which new medium — the Net — is applied: What will be its consequences for people, communities, organisations, societies and their cultures? Further, will the Net provide creative opportunities for being human and for nurturing human well-being?

Of course, it is still too early to answer either of the two keynote questions of this paper, technological or sociocultural. But, when envisioning the futures of the Net, at least two alternative scenarios can be anticipated from the informed discussion surrounding it. One is based in the notion of the 'information society' where the Web has become what Cailliau calls a top-down structure: 'There's one point that puts the data out, and you're just a consumer'[3]. This can be explained by the idea that information has become an economic commodity for commercial exchange, just like pork bellies and company stock. In the West, at least, we are not yet able to leave behind our industrial mindset to embrace post-industrial ways of thinking. We see information as a commodity that can be manufactured, packaged and sold. This is exactly what we

do with our leading industrial mass medium, television.

But information is very different from the typical industrial commodity. Information, when exchanged or sold, remains with both parties, the seller and the buyer. Its value, therefore, can be extended virtually indefinitely. We have yet to fully understand the economic, social and cultural implications of this. Another difference is that information calls out to be given meaning and , in this sense, is just as fluid a phenomenon as information and even more elusive and complex. Its vaule changes according to the many different ways that many different people give meaning to a given set of information. Similarly, we have yet to fully understand the implications of meaning, particularly in different cultures. For example, information and meaning have different interpretations depending on whether the culture is basically Western, Islamic, Confuscian, or whatever.

This leads us to the second scenario, now gaining some critical support, and based on what has been called the *communicative society*[4] where the Web facilitates empowerment and collaborative community development by allowing the exchange and negotiation of meaning — making sense of one's life and surroundings. Conversation is valued highly.

A third scenario, of course, would be some combination of the two.

Berners-Lee, whom *Time* credits with being the Web's inventor (Cailliau being one of Berners-Lee's earliest 'collaborators')[5] is not averse to its commercial use; he said it is inevitable and he orders CDs on the Web. He was disappointed, however, that the Web had come to be more passive and less active than hoped for. In the same *Time* story, Cailliau said it was not intended that the Web become 'just another publishing medium'[6]. Berners-Lee's biggest disappointment was the Web's growing lack of intimacy. It was meant to be a social place. 'The original goal', *Time* reports him to have said,' was working together with others'. 'The Web was supposed to be a creative tool, an expressive tool'[7]. In theory, according to Berners-Lee, the Web could make things work smoothly at all social levels and between them as well: families, workplace groups, schools, towns, companies, the nation, the planet. The original idea had been, he said, an organic expanse of collaboration[8].

So, it remains to be seen what kind of future society the Web, and more generally the Net, will help create: a bigger, competitive marketplace driven by information and communication technology; or a communicative, mutually-supportive community characterised by more concern for a wider, culturally plural society and its planet than simply information and technology, and those who make and own it? Or will we, can we, expect some combination where information and communications technologies are used in the service of people, organisations and communities, as well as for the benefit of those

who make and own them? Will the world become one big video game, and if so, what kind of game? One in which aliens must be killed off, or yet more consumer goods acquired? Or one that is based on mutual support in the pursuit of human happiness and creativity? How will it affect people in countries where most of them still have to walk far to the nearest telephone?

### *Adopting New Technologies*

Spyros Makridakis[9] has reminded us about the imperfect human capacity to predict the use or practical value of new technologies with the example of the economist, Say, writing in 1828 about the possibilities of substitutes for horses. He had declared: '...no machine will ever be able to perform what even the worst horses can - the service of carrying people and goods trough the bustle and throng of a great city'. Say did underestimate the function of the motorised vehicle, but the question remains whether horses cannot better handle the bustle of a contemporary city made even more of a throng with the advent of the automobile.

The introduction of new communications technologies has brought similar surprises which could not have been anticipated at their time of invention or early adoption. When the telephone was invented, mainly for business purposes, no household purpose could be foreseen, something that would arouse amusement from most parents of young and teenage children. And so it goes for the personal computer which, when hooked to the Internet, can see children of most ages, in the richer countries, quickly hijack the household budget for new processors, software and subscriptions.

Also, the unintended effects of new communications technologies can be paradoxical. The introduction of printing, for example[10], consolidated the authority of the absolutist nation state through the new-found ability to codify, in print, regulations and directives controlling the citizenry. At the same time, in Europe, itinerant printers diffused common knowledge and made possible the printed word for specialised niche markets. Thus, the communication paradox of, simultaneously, further centralisation and increased decentralisation, simultaneously.

### *The IT Productivity Paradox*

Another nagging paradox is evident with the introduction of information technology (IT). Although computing power has increased by more than 200 percent in the United States since 1970, productivity, at least in the service

sector, 'seems to have stagnated'[11] until very recently. This paradoxical relationship between investment in IT and productivity was not as expected by politicians and IT experts enthusiastic for the information revolution. At least one critical review of the economic effects of IT[12] has concluded that the visions of massive benefits stemming from IT as the most important motor for growth and economic restructuring have been contrasted by frustration over productivity effects, by uncertainty about impacts on employment, and by enormous concerns about a general 'information overflow' in a global network society.

There has been no conclusive explanation to the productivity paradox despite significant research. This is not surprising given the complexity of the relationship between technology and society. Theories that society is determined by technological change are countered by theories that technology is constructed by the society in which it is invented. It seems reasonable to conclude that coevolutionary change is at work. The relationship, the interface, is characterised by a bewildering array of actors and variables in mutual adjustment.

When faced with a new technology, the players in the game are threatened with change. It would be interesting to revisit the mid-seventeenth century as a critical scholar researching the advent of the slide rule. It is not unreasonable to speculate that the mathematicians who earned social respect from their special ability for mental arithmetic must have felt intimidated by the slide rule and enormously threatened by the prospects for change resulting from the introduction of this new technology. And what about the discovery of the axe so very much earlier?

### *A Learning Process*

Both new tools — the slide rule and the axe — when combined with the rules (the software) for their use, produced two new technologies. Both, it is safe to assume, demanded an unlearning of old habits and the relearning of new ways of doing similar tasks. The appearance of the slide rule surely must have demanded the discarding of certain reiterative and cumbersome processes of manual and mental calculation and the relearning of new ways for applying mechanical manipulations to logarithmic calculation. In present terms, retraining seems essential to shorten the time taken to adapt to new technologies.

In what aspects, then, do the relationships between these two inventions (the slide rule and the axe) and the societies of their time differ from that of the Net and global society in the 1990s? Certainly the technologies are very

different. But so are their social contexts. It would be fascinating to know whether the proponents of the slide rule and the axe paid more attention to the tools and their related software applications, the technologies, than to the contexts of their use; and the unlearning and relearning. Of course there were no technology sections in the daily press when both the slide rule and the axe were invented. One significant difference in context is the current globalised marketplace which has commoditised information, as well as technology.

### *The Nature of Technology*

Why do we place such prime importance on information and the technologies of microprocessors and telecommunications networks, and the software that drives them. Is it because our industrial mindset tends to commoditise them?

The components of IT are information and technology, and using this as an example, it may be useful to revisit the meaning of the term 'technology'. In using the term 'IT', we refer to both the information which is processed (and stored and retrieved ) and the application of this information, the technology. The Concise Oxford Dictionary (1985) defines technology as the: '(science of ) practical or industrial art(s); ethnological study of development of such arts; application of science'. The word comes from the Greek, *tekhnologia*, meaning systematic treatment. Yet, how often is the word 'technology' used to refer to the hardware (and software) alone? Technology is the systematic treatment of applying, in this case information, to something. But what is the something? And what are the consequences?

In answering this, let us take the analogy of a tripod. IT represents two legs of a tripod: the information and the systematic technological application (or treatment) of it using a tool, the electronic processor. The third leg usually missing, represents the context in which it is treated or applied. This context comprises people, organisations and communities. Maybe we should consider replacing the term IT with 'ITS', something like information technology in (or and ) society. A tripod without three legs is pretty useless and IT without fully taking into account its social context can be just as useless.

### *Social Infrastructure*

Generally, IT is seen to provide new technological infrastructure in which information can be applied for the advancement of social, cultural and economic purposes, most usually economic. When we take the technological in-

frastructure out of its context we ignore the social and cultural infrastructure in which it is embedded, or the sociocultural system on which it impacts, for good and bad. And the social (and cultural) context itself has a wider biophysical context of planet earth which is encapsulated in yet other layers of space-time, and more. Our new technologies are not environment-free, in any sense, nor bounded by material and economic considerations alone.

Apart from our habit of industrial thinking, why does the current predominant technocratic mindset of our species too often ignore the social infrastructure? Is this because social infrastructure is mainly invisible and tacit, including as it does certain notions such as institutional entities, activities of organising, training, learning, other intangible acts, and human communication in the form of exchanging , comparing and negotiating meaning? (The cultural aspects are sometimes easier to see than the social, and thus susceptible to commodification, as the arts industry demonstrates.) What is the use of new technological infrastructure if it does not fully account for the way we organise and make sense of ourselves and our circumstances by way of visible signs, symbols and icons, as well as tacit understanding? What of the unlearning and relearning needed before a new technology is socially useful and acceptable? And what of the effects of new technologies on the planet's biosphere?

When it comes to the Net, which integrates IT with networking communications, it belongs to a wider class of hardware and applications usually referred to as ICT, information and communication/s technology. In the term ICT, communication/s is usually used in the engineering sense, adding to IT the notion of linking in order to exchange information via such hardware and applications as cameras and screens, and telecommunications systems, rather than by the related human and social activities of organising, learning and sensemaking. Maybe ICT would be more usefully referred to as ICTS, to make allowance for the sociocultural context.

### *Social Inventions*

The preoccupation with tangible, technological infrastructure over social infrastructure has a parallel when thinking about research and invention. Here is a suggested experiment. Ask a randomly chosen person to list some important inventions. The response is fairly sure to be things such the electric light bulb, the earth-orbit satellite and maybe the wheel. It is less likely to be equally pervasive inventions such as taxation, employment or the stock exchange, which apart from being in a building with some video screens, is largely a social

invention.

Australian scientist, Doug Cocks, has argued that the challenge for science and technology is to match scientific innovation or *the biophysical technologies*, with social innovation *or the social technologies*, specifically to develop research and development (R&D) facilities which primarily and deliberately search for new inventions and combinations of ideas for solving social problems[13]. For example, research could usefully study how the Net would increase employee satisfaction, improve quality of commercial products and services, create new forms of socially useful work (new jobs), and alleviate social alienation.

Do we invest in social technologies to the same extent as we do technologies primarily dependent on tangible new tools? It is difficult, if not impossible, to get the statistical evidence to answer such a question. It is not unreasonable, however, to assert that industrialised countries, and those newly industrialising, spend significantly more research and development dollars on inventing new hardware and software for the Net, than on searching for ways to use the Net to enhance social organisation, and human communication and cultural products. It is not that new tools are not important. They are. But so is attention to the solution of our major social ills and the development of new human potentials.

Do we put technology ahead of civilisation and our future generations? Does the nation state collect taxes from people to invest in technology or people; in technological infrastructure or social and cultural infrastructure? Or both? And what comes first?

One reason we cannot easily answer the question of what is invested in social technologies is that national collectors of statistics unquestionably concentrate on collecting data for indicators of economic growth ahead of personal, organisational and community well-being. The tangible products that can be exchanged in the marketplace now increasingly take precedence in national decision making over human and social intangibles. The Gross Domestic Product (GDP), used internationally as an indicator of national wealth, measures only exchange of goods, and to a lesser extent services, in the marketplace. Personal and social well-being is not a significant commodity, yet, and yields no data apparently thought worthy of collection by national statisticians. But, as we have noted, information is fast being commoditised, perhaps since it is relatively more tangible than human well-being. This makes it much more susceptible to trade. Thus IT, in terms of both its components, attracts much more official attention than its social and cultural context, the social (sociocultural) infrastructure.

### *Nation State under Threat*

But, we face interesting times. The Net ignores the nation state and the people who collect economic statistics about their states, and then use such statistics to make national policy. The Net has helped global commerce bypass the payment of taxation on income to nation states and has weakened the state's ability to collect import duty in certain cases. At the same time, it is a new medium which freely, at least in terms of the signal, crosses national boundaries, as does direct broadcast satellite television. Its potential for interactivity means that it stands far less chance than other mass media of being controlled by the state which can rely only on making direct broadcast satellite transmission and reception illegal without being able to verify illegal use. The Net potentially puts into the hands of people who , under the traditional media are merely receivers, the ability also to be producers.

The characteristic of blurring the distinction between producers and consumers of information makes the Net a very different medium from traditional mass media, such as television. Without the heavy investment needed to produce news for television, for example, individual citizens have been able to receive the news of oppressive events in another country and relay them by email widely to individual citizens in that country where the news has been suppressed by national authorities.

The Net poses real difficulties for national policy makers who must now contend with a challenge to their own authority on many fronts. But , the Net has the same potential to connect people for education and medical care, and legitimate commerce, just as it can connect young children to purveyors of sex and violence, and link international gangs of organised criminals. The transactions exist in virtual reality, in cyberspace, and are relatively invisible compared with transactions that take place on land across national boundaries, or across office desks or public service counters.

### *An Ethical Mindset*

In making wise policy, clear and ethical thinking is called for, unfettered by the dominant mindset of industrialism and the imperative of greed which sees the Net as a bonanza for making money in the global marketplace. While commercial exchange of money is necessary and desirable, the Net poses new questions about the nature of such exchange, hidden form public scrutiny .

The previous powerful new medium, television, changed our personal and social live in terms of how we learn about the world, and particularly about how we eat, what we wear and generally the way we consume; how we shop.

The Net holds, it seems, relatively more power than television to change the way we think; to change our culture. In fact the Net is its own culture, potentially a new global digital culture that can easily envelop us in cyberfantasy.

There are technocratic elites, far from the majority of society, who seek to impose a global culture which would entrance the many as consumers in the cause of short term profit and immediate power for the few. Then there are others, in line with the communication paradox, who see that the Net can simultaneously offer the potential for long term empowerment of the many since it has the potential to dissolve hierarchy while still being susceptible to centralised control.

Can we afford to place, uncritically, the pervasive potential of the Net in the hands of officials and merchants who seek primarily power and profit? Surely the major beneficiaries of this new medium need to be people, and their political and business leaders, who are concerned for the well-being of our future societies and our planet.

We need to question our policy mindset, for we can easily and innocently be led into a new Net culture or we can deliberately create society's wider well-being. The market model of the future seeks primarily a trade in technology, to profit from building technological infrastructure in the cause of productivity and economic profit through the commodification of information and knowledge. The wisdom model seeks primarily to create improved personal, organisational and community well-being; to 'profit' humanely from a new social and cultural infrastructure through new social technologies — social and cultural inventions — inspired by the Net and yielding not just material productivity for a consumer-first society, but cultural richness, personal, organistational and social learning and sound community development; in other words, new designs for working, living and learning in a communicative age.

This paper has virtually ignored the cultural consequences of the Net which are, importantly, the subject of more common analysis and critique (for example in media studies) than are social institutions and processes. The society that decides to focus on its cultural and social infrastructure as opportunities for both commercial and community development will distinguish itself from the many others which are still rushing competitively towards some technological utopia and digital marketplace. Surely the futures of a healthy society lie in its social and cultural enrichment, rather than in some myth of a technology-first market place.

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