Information policy for a new millennium

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Abstract

Previous revolutions, the Agrarian and Industrial, are examined and their features compared with the Information Revolution. Lessons are drawn from the comparison and a range of global issues identified. The nature of the Internet is considered and its pretensions argued to be inflated. The role of the state in developing an information society is discussed. A national information policy is identified as a feature and its application in and implications for Scotland are considered. Key features of an Internet culture are indicated and discussed, with lessons and conclusions for social development within the information society presented.

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Introduction

Possibly the most famous lecture series in the UK is the BBC-sponsored Reith lectures. The 1999 lectures developed the major theme of globalisation. While neither I, nor I suspect my predecessors, would lay claim to the authority or breadth of analysis of the Reith lecturers, the series as a whole is beginning to offer a distinctive coherence to the analysis of information society studies. Each of the previous three Ameritech, now Epixtech, Lectures has focused on grand themes. In the first lecture Trevor Hayward (1997) described the role and dangers of the technology, fearing that profit motives would take precedence over social enrichment. Chris Batt (1999) then examined the role of the library in delivering the information society, which he saw as a continuum of change and not a transformation and with the aspiration that the library should be the heart and brain of the new society. And last year Frank Webster (1999) looked at democratic dissatisfaction and the role – or absence of a role – for technology in resolving the current lack of involvement with politics. This paper will focus on the role of the state in converting revolutionary movements into acceptable societies and in particular will examine the potential of national information policies as the keystone in converting the Information Revolution into an information society.

Four themes will be developed. The Agrarian and Industrial Revolutions offer precedents and lessons for the management of the Information Revolution and will be examined. Secondly, the nature of and background to the issues will be considered. Typically these are both global and universal in nature. Thirdly, the nature of the Internet and its presently inflated pretensions will be described. Finally the responsibility and the role of the state will be considered, particularly in the context of an information policy. It will be the contention of this paper that history shows that the state must involve itself in transforming society and suggest the issues which have to be considered.

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From revolution to society

It is a common and convenient model to suggest that we are entering the third great era of mankind (Duff, 2000). The first began with the Agrarian Revolution when man moved from a nomadic hunter-gatherer society to a more or less stable and settled society based on the cultivation of food. The second was the Industrial Revolution based on the conversion of natural resources into goods and the development of science and engineering. The third is the Information Revolution based on the manipulation of knowledge and the products of the mind. That third revolution is displaying many of the characteristics of the first two and this may give us some insight into the potential and threats as the Information Revolution is transformed into the Information Society. Curiously, while this three-society model has gained wide acceptance, there has been little apparent attempt to consider what lessons, if any, might be learnt from history. And yet it does seem that there are common strands from which such lessons can be learned. Naturally these divisions between revolutions are never clear or absolute. One can still see horse-drawn ploughs in Poland and Stone Age cultures in New Guinea, but they provide a convenient structure for debate

The Agrarian Revolution

Each of these revolutions has an iconic technology. In the case of the Agrarian Revolution (Diamond, 1997) it was the plough although arguably the wheel was a more important development. But as we shall see with the other two revolutions, it is not the iconic technology that is important but the communications infrastructure. The enabler of the new society was the road – whether the Roman road or the King's highway, the road provided a secure infrastructure for the creation of trade through the movement of surplus food and for the developing of trade specialisms. The revolution is characterised by a freebooting spirit based on force, whether that of tribal chiefs, Roman senators or robber barons such as Simon de Montfort. But the state, too, had a role. Its most important contribution was that of currency, which allowed trade to develop. In addition the state offered what would now be called a regulatory infrastructure of a legal code and a security system for the roads. The state itself was feudal, hereditary and imperial, and slavery became common. On the one hand it was based on strict class or hierarchical systems, but it was also imperial in the sense that it depended on conquest rather than nationality. Empires were defined by names such as Roman, Elizabethan, Hapsburg or Ottoman. The winners, if they can be so called, were landowners and possession of land was what defined status. The losers were nomads and hunter-gatherers who did not possess land.

The Industrial Revolution

Here the iconic technology was the steam engine, which led to manufacture and mass production. But it was again the communications infrastructure which turned a revolution into a society. It was the railways and canals that allowed the revolution to flourish into a society. It was invention and entrepreneurship and individual activity which drove the revolution forward in the Age of Improvement. Here in Edinburgh one might mention as an example the prodigious activity of the Stevenson family. Robert Stevenson was engineer to the Northern Lights Board, reflecting the state's interest in managing safety, and grandfather of Robert Louis Stevenson. Although famed for the development of lighthouses, "[Stevenson's] records for the time show a steady flow of reports and estimates for harbours, bridges, piers, canals, drainage schemes, steamboats, roads, memorials, prisons, railways and fog signals" (Bathurst, 1999). The discipline of engineering was virtually invented in a few short decades by such amazing polymaths. Yet here too a new class of industrialist such as Carnegie became known as Robber Barons, mimicking the spirit of a much earlier period. But the state again provided a growing regulatory infrastructure as the revolution became embedded in society. In areas as varied as industrial safety, whether the Plimsoll Line or the removal of child labour, standards such as railway gauges or in the prosecution of free trade or the development of general education and welfare systems, the state created an environment which encouraged expansion. The state in turn became both national and increasingly democratic and slavery ended – at least officially. The nation state as we currently know it is largely a product of the mid-nineteenth century, while the progressive enfranchisement of the population allowed a non-hereditary élite to emerge. The winners were industrialists and manufacturers, while landowners began their decline to genteel poverty. The other great category of losers

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was that of the trades which surrounded the horse-based economy. Farriers, blacksmiths and stable-owners swiftly disappeared as major economic groups.

The Information Revolution

Here the iconic technology is the computer, but again it is the communications infrastructure – the network – which has allowed the revolution to begin the transformation of society. Some of the other lessons are as yet less clear, but using the precedent of the first two revolutions we may discern the outline of what will create the information society. The role of the state is again to be found in providing the regulatory environment. We can see the development of mass higher education through the need for a higher skill set; we can see a regulatory environment such as in the recent sale of telecommunication licences; we can see some legislation and security regulations emerging. Yet we still have the robber barons. Lord Thomson of Fleet famously remarked that having a television franchise was like having a licence to print money, while figures as varied as Bill Gates, Robert Maxwell and Rupert Murdoch are only the first and the most famous of a tribe now caricatured as dot.com millionaires. We might then feel that the nature of the state itself is changing. It is an increasing commonplace that the state is at the mercy of global corporations, which can bypass national conventions. In his 1999 Reith lecture series Anthony Giddens noted:

> The radicals argue that not only is globalisation very real, but that its consequences can be felt everywhere ... Nations have lost most of the sovereignty they once had, and politicians have lost most of their capability to influence events. It isn't surprising that no one respects political leaders any more, or has much interest in what they have to say. The era of the nation state is over. Nations, as the Japanese business writer Keniche Ohmae puts it, have become mere "fictions" [1].

Whether it is a currency speculator such as Soros attacking currencies in ways much more damaging than any military adventure, or global conglomerates such as the Disney Corporation or News International, richer than most nation states, or criminals such as Colombian drug barons, these global groups appear to be wresting power from the nation state. Their form of government appears increasingly oligarchic with the odd dose of heredity. The most obvious winners in this revolution are content providers, although no doubt others will emerge. It is then cheering to note that thanks to the persistent curiosity and invention of individuals, anarchists may also emerge as winners. The ability of the authors of the Love Bug and Melissa viruses to puncture the thick hide of these corporations or the 15-year-old boy in Montreal who can penetrate the Pentagon defences should be welcomed.

Lessons

The template used to describe these three revolutions allows us to begin to adduce some general lessons about the role of the state. The first and most important is the need to create a benign regulatory environment. It is clear that transformation comes through the work and inspiration of individuals, but if they are not to make developments purely at the expense of the community, the state has to provide a set of acceptable rules and police these rules. Next it must mobilise human capital. The progressive expansion of education to all classes, all cultural groups and significantly to all genders has been and continues to be an essential function of the state. Thirdly it has to arrange – note arrange not provide – an equal access to a high quality communications infrastructure, whether roads, telephones or networks. In this respect the Bangemann Report (Bangemann, 1994) for the European Union, which proposed leaving the creation of networks to the market, must be seen as a pernicious and malign influence. Finally, it must mobilise and encourage the private sector to take and be appropriately rewarded for the risks associated with these developments.

The global issues [2]

Poverty is an issue in almost every country, although it means different things in different places. Tabo Mbeke, President of South Africa, recently and famously pointed out at a G7 summit that there are more telephones in Manhattan than in Sub-Saharan Africa and that most people alive today will never make or receive a telephone call. Alabama has a higher illiteracy rate than Cuba while participation in tertiary education in West Belfast runs at 2 per cent against a national average of almost 50 per cent [3].

Equity is a second key global issue. Equity between countries, between racial groups, genders and individuals has been the goal of all democratic states and while we may have moved a long way from the Marxist notion of

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"from each according to his abilities, to each according to his needs", the goal of equal opportunity to benefit from social and technical progress remains a powerful driver if not yet a universal ambition. At the state level inequity is a key factor in attempted military solutions to social and national divisions, which we can see in countries from Afghanistan to Zimbabwe.

Social inclusion is another key factor in the development of well balanced and happy communities. For every Margaret Thatcher declaring that society does not exist (Thatcher, 1987), there is a John F. Kennedy declaring that if a free society cannot help the many who are poor it cannot save the few who are rich (Kennedy, 1961). Worry is regularly expressed by governments about the development of an excluded social underclass which has the potential to damage the development of any society and history is littered with revolutions by slaves, peasants, disenfranchised ethnic groups and oppressed minorities of every sort. Social exclusion leads to social disorder and a whole variety of non-governmental agencies as well as governments place high priority on preventing this.

Government/private sector balance is another global concern. The state can rarely afford the luxury of developing or owning all that it wishes to provide for society. A key role of governments is then balancing what it should provide, what it should leave to the individual to provide and what it should encourage or regulate the private sector to provide.

Education for all or at least educational opportunity for all is an ancient Scottish fetish. The concept of the "lad o pairts" is one long familiar to us. Michael Young neatly summed this up and captured the essence of the three great eras in his coining of the term "meritocracy": "not an aristocracy of birth, not a plutocracy of wealth, but a true meritocracy of talent" (Young, 1958). This can again be illustrated in all societies and at all levels whether in the British Government's wish to push participation in tertiary education up to the 50 per cent level or in the decision of the newly elected Government of Malawi to offer free primary education to all girls.

Information rich and information poor is the final global issue to be mentioned. There can be little quarrel with the phrase since almost everything in life from food to Rolls Royce cars displays the existence of haves and have-nots. But in terms of information it is a much more complicated phenomenon than is often supposed. Hayward saw it as a function of wealth. As disparities of wealth have grown in all countries in recent years, he envisages an élite and wealthy class with access to technology, oppressing the vast majority of the population without such access (Hayward, 1997). But it can be argued that this is an over-simplistic approach to the phenomenon. Language is a factor. The inexorable growth of English as the language of the Internet disenfranchises important socio-economic groups. The existence of plutocratic dinosaurs unable or unwilling to use a terminal and leaving such menial chores to secretaries will no doubt diminish but is real – our own beloved Prime Minister being a classic example of this. Lack of access to communications is a determinant, but this applies to everyone in small communities remote from major centres rather than the economically poor. Conversely technologies as varied as television, inventions such as the clockwork radio and the apparent ubiquity of the mobile telephone suggest that access to technology is not alone the determinant of information poverty. Internet cafés are as available in Sri Lanka or Thessaloniki as in San Francisco.

Finally let me suggest that these global issues offer three lessons to governments, lessons which were just as valid in the earlier revolutions. First, technology is not patriotic. It is a terrifying thought that it is claimed that 90 per cent of the world's computers use Microsoft Office. Technology is sold where it makes a profit and may usefully if unfairly be compared with the amorality of the arms industry. Second, investment capital is not patriotic. A totally market-driven *laissez-faire* approach to development is an abdication of responsibility and can lead to the sort of despoliation of the state last seen in the rush to acquire the mineral resources of Africa last century. Third, and more positively, although the race is to the strong it is also to the swift. Small and nimble societies are more likely to be successful than bloated large states. A fundamental technology shift sets all societies back to the same starting point and removes many of the benefits of the incremental growth of the superseded technologies.

The inflation of the Internet

There is a tendency to genuflect towards the Internet as some finished and stable product

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whose only limiter is our imagination. Yet, as I have argued elsewhere [4], the Internet is inappropriate for scholarly communication: it is unstable, insecure and with the World Wide Web a mere six years old, it remains a giant experimental environment. The size of the Internet is taken to be huge and numbers quoted in hundreds of millions of pages inevitably create an impression of huge size. While the growth rate of Web pages is undoubtedly huge, the numbers have been recalculated by Lesk (1999) to show that there are the equivalent of about two million books available – in other words the Web is about the size of a decent university library, but with none of the rubbish filtered out. The present state of the Internet was usefully described by A.J. Wright[5], in a comparison with a traditional library:

> . . .the shelves have been removed . . . the materials lie in huge piles all over the building. The locks on the door have been changed, and there are vendors everywhere selling keys . . . you find the call numbers have been changed into a language system you do not understand. The OPAC terminals are gone, but there are voices everywhere – you cannot see anyone – talking about this or that guide. You pick up the first book you see and find that its contents have been transformed into language for which you will need a special translator. "Welcome to the virtual library" says the display[5].

The view of current users was recently and eloquently described by David Bouchier, an avowed technophobe. He noted that:

> From time to time I venture into the howling wastes of the Internet. The technocrats promise us that this information overload will increase a thousand times, ten thousand times until every suburban home will have access to every piece of useless information in the universe (Bouchier, 1994).

I have commented elsewhere and at length on the inappropriateness of the Internet for scholarship and on the fact that it is essentially an immature medium that lacks almost all the features required for academic discourse. This can perhaps best be shown by a brief review of the inadequacy of search engines. It has come as a shock to many to discover how partial search engines are. The search engines have recently come under proper scrutiny. Rather to everyone's surprise it has become apparent that they address only a fraction of the estimated 720 million Web pages. Coverage varied from a best of 34 per cent for Hotbot to a worst of 3 per cent for Lycos (Lawrence and Giles, 1998) Within that, up to 5 per cent of links were "broken" although "pages that timed out were not included in these statistics" (Lawrence and Giles, 1998). This can be illuminated by an anecdote. On a recent visit to Aberdeen as an external examiner, I wished to book a hotel and being an Internet veteran chose to do a Web search using the two words "Aberdeen" and "hotel". The search produced 374,412 hits, the first of which was for a hotel in Aberdeen, Maryland. The number of hits exceeds the population of Aberdeen! Now of course the search could have been refined, but how much easier to ask a reference librarian the same question and be presented with the appropriate pages of *Where to Stay in Scotland*. The system is also capable of manipulation. Companies have emerged in the USA whose sole activity is to guarantee its customers a place in the top ten of any Web search, that is to say a place on the first page of search results.

In sum, then, the Internet does not represent a finished monolithic product, which we must accept or reject. It represents an unfinished and giant project to which we can contribute and whose development we can influence.

The role of the state

The role of the state in developing society can now be considered in more detail in the light of the historical and global background. The state has first of all the responsibility to deal with issues of poverty and equity. This might be caricatured as ensuring education and communications infrastructure available to all. As an example of this, it is interesting that perhaps the first attempt at a national information policy was the championing of Al Gore for the creation of the information superhighway. At the same time the collapse of the command-driven economies of Eastern Europe reminds us that the private sector is the engine of the economy and the role of the state is to harness its drive and initiative to the public good. But the state also neglects at its peril the responsibility to ensure the inclusion of all its members whether as stakeholder groups such as libraries or as individual citizens. The function of the state is to improve lives and here for the first time libraries might be mentioned. The Library and Information Commission as almost its last act released a statement on social inclusion. Publicly funded libraries are both major stakeholders in developing and implementing national information policy and are one of the tools which the state can use to improve lives and develop social inclusion.

> Combating social exclusion requires an integrated approach to tackle personal and social

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> as well as structural issues. Libraries epitomise inclusion in their values and activities; and by their presence in local communities. Through the facilities and services they provide, libraries help to build the capacity and resourcefulness of people and places; and by doing so they make a major contribution to personal development, lifelong learning, social cohesion, employability and enterprise, a sense of neighbourhood, and the health and well being of communities. Libraries are the essence of inclusion [6].

The state also has to have a vision of why we are wiring up society. We're not wiring the world to get to the Disney Channel or to provide a society of consumers. Government's role is to ensure a society at ease with the Information Society, one that equips its citizens to develop and grow and be economically satisfied. That vision of how an information society can be created is then perhaps best expressed through a national information policy.

National information policy

The concept of a national information policy first began to emerge in the early 1990s. In some countries it emerged as an absence of policy. Representatives of the Office of Arts and Libraries, the predecessor of the Department of Culture, Media and Sports, used loftily to declare that our national information policy was not to have a national information policy. More recently, Tony Blair has provided a more helpful definition of what such a policy should be: "A co-ordinated strategy, which will focus on transforming education, widening access, promoting competition and competitiveness, fostering quality and modernising government" [7].

However, Moore (2000) has described a much more positive set of developments, typically in smaller countries. In Europe he perceives a sharp distinction between the small countries such as Finland, Denmark, Portugal or the Netherlands, where the state has made a concentrated effort to develop new information societies and economies. This development is mirrored in other smaller states such as Malaysia or Singapore, with its enviable concept of "the intelligent island". He contrasts this with the flabby middle European countries ranging from Austria to England, where substantial technological change and investment is taking place but where issues of scale and co-ordination are preventing coherent plans from emerging. If one then looks at Scotland one can then argue that there is a clear opportunity to escape from the soggy middle band into the nimble band of countries that can most easily transform themselves into true information societies and economies.

National information policy and Scotland

Let me quote again and at some length from Anthony Giddens's first Reith Lecture, since it expresses my views much more eloquently than I can:

> Globalisation not only pulls upwards, it pushes downwards, creating new pressures for local autonomy. The American sociologist Daniel Bell expresses this very well when he says that the nation becomes too small to solve the big problems, but also too large to solve the small ones.
>
> Globalisation is the reason for the revival of local cultural identities in different parts of the world. If one asks, for example, why the Scots want more independence in the UK, or why there is a strong separatist movement in Quebec, the answer is not to be found only in their cultural history. Local nationalisms spring up as a response to globalising tendencies, as the hold of older nation-states weakens.
>
> Globalisation also squeezes sideways. It creates new economic and cultural zones within and across nations. Examples are the Hong Kong region, northern Italy, or Silicon Valley in California. The area around Barcelona in northern Spain extends over into France. Catalonia, where Barcelona is located, is closely integrated into the European Union. It is part of Spain, yet also looks outwards [1].

It is then particularly welcome to see one of the priorities of the new Scottish Parliament being the development of Digital Scotland. A whole series of task groups has been set up to look at infrastructure, education, the economy and lifelong learning. The Parliament itself has committed itself to digital democracy even if it seems to have little idea as yet of how to convert the soundbite into action.

Scotland already possesses many of the building blocks which make an implementable plan appear a real possibility. When Tony Blair declared that the three priorities of his government would be "Education, education, education", this had a great resonance in a country which has long prized (but often neglected) its educational system. Then there is a long tradition in Scotland of public service and public good and a strong strand of co-operation. Projects such as SCRAN, CAIRNS and SCONE and groups such as SCURL or HEIDS demonstrate in their names a strong cultural identity and in their

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practice embody co-operation. Wise investment by bodies such as SHEFC have ensured a significant national network infrastructure embodied in the Metropolitan Area Networks. There is some understanding of this in the ambition to win the great prize of a common national network for the education sector which brings together the plethora of UK initiatives in this sector. Robert Craig, the director of SLIC, has imaginatively used the metaphor of creating six tramways between Edinburgh and Glasgow or a single high-speed railway. The benefit of that great prize can be looked at in terms of the capacity to download a large file such as the movie *Titanic*.

Downloading the Titanic

- 28.8Kb modem = 42hrs 30m.
- ISDN Line = 9hrs 14m.
- T1 line (1Mb) = 49m 20sec.
- JANET minimum set (10Mb) = 7m 23sec.
- Strathclyde backbone (1Gb) = 10sec. (Taken from *USA Today*, 12 October 1999)

The creation of a national backbone network will provide a useful litmus test of whether the settled will of the Parliament is indeed to create an information society here.

Building an Internet culture

Philip Agre has defined a set of rules [8] for building an Internet culture and these bear examination since they emphasise that in the creation of a new culture and society it is not the technology but the social structures which are critical. We should resist the technology sales pitch. The world is full of snake oil salesmen and the computing world has a particularly dense concentration. Remember that classic definition of a computer as a very fast idiot. Computers speed up processes but it might almost be a variant of Murphy's Law that doing something stupid very fast doesn't make it any less stupid.

We should not put technology on existing dysfunctional institutions. Organisations don't work because the wrong people are doing the wrong things, not because of technological weakness. The proper course of action is to make the organisation functional. Technology may then help the right people do the right things better or quicker.

We should develop people not machinery. The world is littered with unused or underused technology. Computers which could run a small country are used for e-mail and word-processing largely through a failure properly to skill the workforce. One Scottish local authority currently has as its development plan the creation of a thousand blue-collar apprenticeships. Creating new jobs is of course eminently laudable, but one wonders what society will find for a thousand new carpenters and plumbers to do.

We need to build an Internet civil society. In last year's Ameritech Lecture, Webster (1999) recorded the growing dissatisfaction with politics. Some charities have more members than our major political parties and voting rates continue to decline, partly because of the apparently increasing irrelevance certainly of local politics. Societies do of course just happen if left unattended but the sort of society we all might wish to see develop will benefit from some building and encouragement.

There is a tendency to treat the Internet and the World Wide Web as synonyms. They are not. E-mail is perhaps more important than the Web since it implies communication between people rather than a relatively passive individual activity. The art of letter writing seems largely to have died out in the middle of the last century. Curiously it has seen a recent if somewhat mongrel revival through e-mail leading to an increase of communication if not understanding between such groups as parents and student children.

Perhaps obviously, one should analyse both the technical and cultural environment. Building an Internet culture will depend on identifying the problems or issues first, then identifying appropriate solutions. Good outcomes rarely come from identifying technological solutions then seeking problems to which they can be applied.

The best use of technology is to amplify existing sharing. Where institutions are working together and well, the technology can be used to enhance this process. There is and will be a vast range of technological options. Although it has been argued here that the information revolution is transformational rather than representing a continuum of change, that transformation will be most readily absorbed through the reform of existing beneficial structures. It is a mistake to distribute technology randomly. The history of UK schools is, for example, littered with well meant but ill-considered attempts to distribute technology with no consideration of the issues surrounding such distribution.

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Initiatives typically fail due to a failure to address issues of support and sustainability.

Education should be directed to social organisation not technology. Teaching people to use a particular bit of hardware or a particular piece of software is rarely a good investment. The pace of technological change is such that the knowledge is often outdated before the training is completed. An understanding of concepts and social organisation is much more relevant. Universities are full of those trained to use mainframes attempting to use them to provide Internet solutions.

Machinery does not fix social problems and institutions. A shared vision of the way ahead is much more important than the particular technology currently in use. It is the social and human issues which will determine whether we build an information society rather than the ability to make a particular technology work.

Three challenges

The argument of this lecture can perhaps best be summed up by posing three challenges to those who wish to see the development of an information policy.

First, the management of things. The Internet is full of a vast array of information in a huge variety of media. The term coined for this is "stuff". We need to make this "stuff" coherent. Librarians have a major role to play in this. They need to take control of the management, organisation, filtering and preservation of this great amorphous mass. To paraphrase Ranganathan we need to build structures which will deliver the right information to the right user at the right time.

Second, the management of relationships. Despite the claim for a tradition of working together, this has tended to be sectorally based. We can already see barriers and firewalls being erected between different communities and it is important that these are broken down and a climate of trust created. For the first time in recent memory, at least in the UK, the availability of money is not the first and over-riding concern. Much more important is the need to build trust so that local government can work with higher education, the health service with industry, even Glasgow with Edinburgh. In the last year or two Scotland has had a real sense both of community and purpose and there can rarely have been a better time to foster and improve community relationships.

Third, the management of perceptions. It is critically important that the creation of an information society is seen as relevant to all sectors of the country. It is not a luxury; it is not an add-on; it is not an élitist minority need. In a counsel of despair, Woody Allan once wrote that "More than any other time in history mankind faces a crossroads. One path leads to despair and utter hopelessness. The other to total extinction. Let us pray we have the wisdom to choose correctly" (Allen, 1980). This nihilist approach has little to commend it but humour. If we are to create a brave new world its relevance has to be seen and understood by all. A clearly articulated national information policy is the keystone to demonstrating that relevance.

Conclusion

Scotland has a long and distinguished tradition of invention in all sorts of fields. If James Watt is irredeemably linked with the Industrial Revolution, names as varied as Alexander Graham Bell and John Logie Baird and Robert Watson-Watt have already contributed to the information revolution, but "These days are past now, and in the past they must remain" [2]. It is my contention that it is time for us to move from the information revolution to the information society. In order to do that the state, in the form of our new Parliament, must recognise its responsibilities, learn the lessons of the past and move to create the sort of environment which a national information policy must address.

There are half a dozen messages that I would wish our elected representatives to remember when they come to consider framing a national information policy. First tools are just tools. It is not enough to fill our educational system with computers or to build a network. We need a vision of what kind of society we are trying to create. Second geography is not destiny. It is quite clear that at least for the moment it is small and swift acting societies which are adapting best; Singapore, Finland, Malaysia and even Vietnam are the sort of countries which appear to be adapting best, while it is of the nature of a global communications revolution that we are removed from the tyranny of distance. Third, bad management is not the same as destiny. We are not helpless in the face of large global conglomerates, but are quite capable of creating structures that are

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adaptable, hospitable and societal. Fourth, we should avoid mainframe solutions to Internet problems. One of the most notable features of the short history of computing is the rapidity of the successive waves of technology. Technologically-based initiatives are unlikely to prove as productive as innovative thinking. Fifth, we must recognise that content is king. Commercial pressures are aimed at converting us into a nation of mouse potatoes consuming entertainment and shopping. Yet a nation rich in culture, industry, invention and science has a huge contribution to make to the knowledge economy and we need as part of our vision to be clear about what we can contribute as well as consume. And finally, it is irresistible to conclude without a reference to one role of librarians in shaping the information society. If content is king, metadata is the king's interpreter. There is little point in having seven hundred million pages of Internet content if one can find either nothing or too much. Metadata, otherwise cataloguing in its Sunday clothes, will be central to an information policy, for it will be in the management of information that the state can perhaps find its most effective role.

Let me finish with an image which I have found sticks in my memory. In the Disney film *Fantasia*, one sequence is played out to Dukas's music, *The Sorcerer's Apprentice*. In the cartoon, Mickey Mouse, charged with cleaning the cellar floor, puts on the sorcerer's clothes and ignorantly waves the magic wand at the brooms in the cellar. They begin to bring in buckets of water and to mop the floor. But it is soon clear that the brooms and buckets are out of control and filling the cellar with water. Only the arrival of the sorcerer ends the growing nightmare. Jill Foster of Newcastle University has compared this to the situation on the Internet. In her image Mickey Mouse is the archetypal computer scientist who has unwittingly unleashed buckets of information onto the network. All he does serves only to make the situation worse. But says Foster, all is well, because she knows who the sorcerer is – he is the chief cataloguer of Newcastle University Library...

Notes

1 The first lecture in the series by Anthony Giddens may be found at http://news.bbc.co.uk/hi/english/static/events/reith_99/week1/week1.htm

2 Much of this section derives from an unpublished paper given by Kelly McNamara of the World Bank Institute given at a conference "Keystone for the Information Age: a National Information Policy for the UK" held at the British Library by the British Council and the Library and Information Commission in March 2000.

3 Private communication from Wallace Ewart, Pro Vice-Chancellor, University of Ulster.

4 For example, in Law, D. (1999), "Scholarly communication in an electronic environment: problems and challenges", *Alexandria*, Vol. 11, pp. 135-42.

5 PACS-L contribution of 25 February 1992.

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