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I. Introduction

In this chapter, current developments in information technology and information systems will be discussed, focusing especially on the social and political implications of such developments. Current technological developments have led to a shift in focus from information to the communication of information; the most visible evidence of this shift is the development of social networking sites that enable individuals to contribute and share information. This is the popular tip of a more fundamental iceberg, which has implications for privacy, security, governance, digital divide, surveillance, and increased dependency of individuals on technology and the organisations which design, produce, and support such technologies.

II. Web 2.0

In the last year, much of the discussion of new technologies has been centred on Internet applications such as YouTube, Flickr, Wikipedia, Del.icio.us, Digg and social networking sites such as Bebo and Facebook. These are generally grouped together under the general rubric of Web 2.0 : user-generated content, dynamic web publishing, and online social groups.¹ Given the amount of news coverage given these new applications, one could be forgiven for thinking that debate about the future of the Information Society is now passé. Where discussion previously focused on the consumption of digital information, as individuals accessed information provided by organisations, these popular new Internet applications enable sharing of information amongst users who are now individual information providers. Discourse has moved from the Information Society to the Communication Society. This conclusion is understandable, since there is good empirical evidence that the Internet is, decreasingly, less a means by which organisational information is provided to users than a means by which user-generated information is shared amongst other Internet users. For instance, according to a recent report from blog tracking firm Technorati, every day 100,000 new blogs are created and 1.3 million posts are made.² MySpace, one of a number of ‘social networking’ sites (others include Facebook, Bebo, MSN Spaces, Friendster) claims about 57 million registered users, and is currently ranked the fifth most popular English language site on the net by the Alexa ratings service.³ This growth took place within 36 months. One of the popular blogging sites (Web logs or online diaries) grew by 528 percent (Blogger.com) between February 2005 and February 2006, according to market research firm ComScore Media Metrix.⁴ Recent growth in Internet traffic has been dominated by these new applications.

This collection of applications, collectively known as Web 2.0, enables individuals to share information (including videos, photos, news items, and audio footage) and create virtual communities on the web. The previous growth in the

amount of information in digital form has been replaced by growth in the communication of that digital information. The growth of these applications seems to also fuel a growth in online or virtual communities. The USC-Annenberg School Center for the Digital Future was able to report that 43 percent of Internet users who are members of online communities say that they “feel as strongly” about their virtual community as they do about their real-world communities. The 2007 Digital Future Project found that Internet use is growing and evolving as an instrument for personal engagement – through blogs, personal Web sites, and online communities (30/11/06, www.digitalcenter.org). The Pew Internet and American Life Project, which undertakes large scale surveys of US Internet use, reports a similar significance of virtual communities for an increasing number of users (<http://www.pewinternet.org/>).

These changes have enabled new forms of information, based on combining data available in various databases as well as supplementing them by data provided by users, and it is these new ‘mashups’ (a website or web application that combines content from more than one source) that have captured much attention. Aerial maps of localities, combined with information about physical structures provide new ‘value’ to the user (google map), as do book listings that include reviews of books (amazon.com). It is not just the circulation of information that is revolutionary, it is the combination of existing information sources to provide new content that has increased the value of Internet access for many users.

III. Mobile data

In the midst of this excitement about new forms of information, based on applications that draw from shared data sources and content contributed by users, little attention has been paid to the important technological changes that enable these changes. To a large extent, these changes are not because of new ideas that no one thought of before; these changes are the result of technological changes that have made old ideas now possible to implement. These technological changes have implications often not appreciated by those who now routinely write blogs, visit social network sites, and exchange video files. This communications ‘revolution’ is driven by three technological developments: 1) inexpensive online storage, 2) inexpensive and widely available fast broadband access to those remote sites and 3) a proliferation of inexpensive digital devices that can capture audio and visual data. These infrastructure developments enable more digital content to be created by users, it enables the content to be transferred, and it enables remote storage and then access to information from any location, without requiring the user to carry information around with them. Without these developments, the new wave of internet applications would not be taking place. This is not the first time that people would have wished to have access to audio or video files, or store them online, or create complex web sites based on data from different sources. But it is the first time that it is now affordable to capture personal information in multiple formats (audio, video, text, photo), transfer it rapidly and store it remotely. Data capture costs have decreased to such an extent that anyone who has a mobile phone (which, increasingly, is virtually anyone in the developed world) can capture an image, and transfer the digital form of that image to the Internet. Data storage costs have reduced to such an extent that only marginal profits are necessary to enable organisations to offer ‘free’ storage of user-generated information; inexpensive telecommunications enables individuals and organisations to share the digital data they have obtained. The consequences of these developments are obvious, as people store and update information, create links between information, and collaborate on the exchange of information.

Less obvious are the broader social and political consequences of this shift, as information moves from the individual to the organisation. The ease with which individuals share data is the result of complex software innovations that are beyond the expertise of most users of these sites. Very few of the users of Bebo or MySpace would be able to write the software necessary to upload video files, create links to sites of friends and so on. This accelerates a change in the way individuals relate to the Internet. In its early stages, it required only limited expertise to learn file transfer protocol (FTP) in order to store information, or hypertext markup language (HTML) to publish information. Anyone could create and manage their own information publishing, limited only by their access to increasing affordable computer and telecommunications resources. This new communication-based Internet requires the use of, and a dependence on, sophisticated software and users become dependent on the sites which provide the necessary software. Users expect that personal information will be kept private and also expect that it will not be used for commercial purposes. In so far as the software is controlled by 'network geeks' who are unlikely to abuse their position, that may be acceptable. However, 'private' information on a personal site being publicly available (as happened with MySpace over a number of months⁵) is, at the very least, a challenge to privacy protection. What happens, however, as these sites are bought by commercial organisations? The Wall Street Journal noted suggestions that Yahoo wanted to buy Facebook in September 2006, and YouTube was purchased by Google in October 2006. Individuals are already unable to control what happens to data now stored on remote locations in their 'personal' directories, and must accede to policies dictated by the remote site which hosts their data. What then, when users of these sites are owned by commercial entities?

Remote data storage has moved centre stage in a way difficult to envisage from the early suggestions of 'thin clients' by Oracle's Larry Ellison in 1996 and again in 1999, and sites that enable sharing of data is only part of the picture. Equally important is the facility for individuals to access personal data files from any location, without having to carry that data (and appropriate software) around with them. Using a web-based word processor that permits remote storage of files enables greater individual mobility, from computer to computer and from location to location. It also means that the user does not need to have planned, in advance, which files would be needed and transferred the files to the appropriate laptop computer or memory stick. Similarly, online calendars not only enable sharing of information amongst a restricted group, they also enable the more prosaic benefit of individuals having continuous access to their own schedule. But, who else is accessing that file? The owners of the inexpensive online storage site? The individuals who have either hacked into the system and stolen the user's id and password or simply stolen it from the user? How many users of these sites even read the data protection policies that they agree to when first registering with the site?

With this new generation of web based computing, data protection becomes an important issue in a new way. How safe is the personal data being provided and how is the host site using the data that is stored there? Rules about data protection vary from jurisdiction, and issues that arise are not only what commercial use will be made of such data, but also whether governments use this information in data mining projects. This issue has become more significant as computer processing power has increased. With the increase in the amount of digital information stored on computers has also come an increase in computer processing power that enables the analysis of this information.

IV. Identity and validation

Equally important is the issue of trust, access, and identity theft. The rise of identity theft results from the lack of a secure and usable validation system for individuals. It has not been easy to devise a system by which an individual can demonstrate, in a safe way, that they, and no one else, is entitled to access information. This may be a minor issue for non-confidential information that a person puts up on their own personal blog. But, if the trend is to greater amounts of information being stored on the Internet, then not only does that information have to be stored and protected, but there has to be trustworthy means of authenticating the identity of the owner of the data. Trust is a general issue in social capital research, but is also often an issue in collaborative work when information must be shared. Users are well used to trust in terms of who a person is, but in collaborative work situations, there is also trust in terms of how information is going to be used (Komito 1998; Kelly 2005). Will there be any consequences for the information provider if the information is not used appropriately?

As matters currently stand, individuals need a userid and password for each site that they use. The proliferation of userids has led to debates about creating easier means of authentication, but, so far, no simple and widely accepted system has developed. Digital signatures, based on public key encryption offers an obvious solution (if Certification Authorities were widely and affordably available). However, there appears to be little public interest in such a solution, to judge by the small number of individuals whose email includes any authentication protocols. A relatively small number of people even restrict access to their personal information on social networking sites; personal privacy concerns are of low priority for social networkers.

Ironically, the lack of authentication to enables rationalisation of the diversity user's data repositories sources and inevitable proliferation of userids is actually a safeguard of privacy. There are various proposals to enable individuals demonstrate their identity and validate their right to access their information (sometimes phrased a 'single sign-on'⁶). Biometric identification, which depends on one or more intrinsic physical or behavioural traits that uniquely identifies an individual, is one suggestion, another has been a single identifier for email, mobile phone, or landline phone contact information. Regardless of the approach taken, any solution has privacy implications. In order for an individual to access all their personal data, then, by definition, all their personal data must be marked as linked to them and them alone. That means that anyone with sufficient access privileges could have access to complete knowledge about the individuals. It may be difficult to devise a secure means of validating identity that does not also pose a threat to privacy. The best protection for personal privacy may be the lack of a uniform system of personal authentication.⁷ However, a commercial demand for such links between information and individual is coming from an unexpected source – organisations seeking to assert copyright as user-generated content increases. Many sites that enable users to contribute their own content are shifting copyright responsibility for such content to the users themselves, and the sites claim that, like the telephone or postal system, they are merely common carriers. If such a claim becomes accepted, then the kind of commercial pressure that led to the development of encryption protocols embedded in web browsers (the `https://` tag that identifies an encrypted web exchange) will be applied to devising a system of linking individuals and data.

V. Pervasive Computing

Digital data is becoming easier to capture and, due to increased computing power and decreased computing costs, the overhead for collecting and analysing this data is decreasing. It is getting easier and cheaper to analyse digital information, and more and more of our transactions are digital in nature. From bus tickets to mobile phone calls, an increasing amount of information is processed in digital formats. In addition, there is the increased facility for computer systems to exchange data with each other. Until relatively recently, the best protection against loss of privacy was the inability of different computer systems to exchange information with each other. Increasingly, not only are there standard data storage protocols, but the use of XML has grown as a language to facilitate information interchange. Like many Internet applications, XML may not have been intended to be used as it now is, but when working with different platforms, often incompatible with one another, and several databases, XML provides platform-independent protocol for transferring information from one application to another.

Government activities contribute to this pervasive data flow, as the drive for efficiency is leading to e-government. This is the delivery of services electronically, linked with the internal transformation of government processes to take advantage of new technologies. More internal government activities are based on digital information exchange, in an effort to reduce dependence on paper files (Komito 1998; 2004; 2005). This quickly becomes a means of delivering services to citizens, for example, the use of smart cards and electronic funds transfer for social welfare payments. E-government is motivated by efficiency benefits: it is cheaper to provide information electronically than to require human beings to answer questions. It reduces labour costs not only by removing individuals who answer questions on phones and process information and getting the user to answer their own questions, but also by getting citizens to complete their own forms electronically, thus enabling processing of information without paying for data entry.

The transition from paper files and filing cabinets to electronic documents and databases linked with work flow structures is not restricted to governments; this process is underway in all organisations. This transition may not be smooth, as stories of the slow, problematic, move to electronic medical records throughout the world demonstrate (Nygren and Henriksson 1992; Harper, O'Hara et al. 1997; Berg and Toussaint 2003; Ash, Berg et al. 2004), but it is relentless none the less (Sellen and Harper 2002).⁸ The initial rhetoric of the computer revolution was personal empowerment and freedom from dependence on intermediaries. Individuals with PCs on their office desks or at home 'owned' their own information, manipulated it using PC based software and made their own decisions. This was, implicitly, linked to a decentralized work pattern, where improved computing power enabled decision making to be delegated to local managers.⁹ However, recent changes in organisations' IT infrastructure suggest a change. Organisations that previously moved from centralized mainframes with dumb terminals to decentralized PCs with shared data and printing, are now installing applications and data held in a central location and limiting both local information storage and local autonomy in choosing software. Thin clients in the corporate world mimic the remote data storage and processing of Web 2.0 in the wider world. Furthermore, instead of decisions being decentralised, increased computing speed and data transfer speeds enable central headquarters to exercise more, rather than less, power over remote locations. Either decisions are made at headquarters, or else decision criteria promulgated and enforced from central HQ effectively reduces the autonomy of local branches.

If organisations are to make best use of the information they possess and ensure shared knowledge, they must also ensure standardisation of data storage and discourage private data hoards. The creation of data repositories on a personal computer does not benefit others, and data in diverse and incompatible formats on personal computers is, equally, of no commercial benefit to organisation. Thus, organisations try to ensure centralized control and then sharing of information. Many organisational tasks do lend themselves to incorporation into information systems. In this sense, the aim of Taylor's scientific management (Taylor 1911; Clawson 1980) to move from expertise and skill under individual control (and with inevitable variation from one worker to another) to a standardized set of rules has come to pass. However, instead of rules and procedures in manuals that workers learn, they are embedded in the organisations' information system and workflow structure. In modern organisations, remote storage of information also means remote storage of procedures, rules, and decision making criteria. Many work tasks can be described in this 'assembly line' language: procedures are routine and options/choices can be predicted in advance. Thus, a cash register prompts the operator for the next step ("have you checked the credit card signature?"), and the call centre operative responds to callers according to a fixed menu. This enables organisations to treat staff 'replaceable' or interchangeable, and pay low wages to staff with little prior expertise or experience.

However, not all organisations lend themselves to such rigid structures, given external environments and variable types of work (Burns and Stalker 1961). There remain tasks the outcomes of which are unpredictable and which require impromptu collaboration and coordination with others. While information systems can facilitate this work (booking an operating theatre for a surgical procedure), the work itself remains outside the scope of formalisation. It is flexible, requiring rapid response to new data, and interpretation of complex information. This not only remains outside the scope of automation, but can be made more problematic by new working situations in which people are likely to possess the shared experiences that are the basis for dependable interpretations of the work produced by others. The growth of research in Computer Supported Cooperative Work (Suchman 1987; Hughes, Randall et al. 1991; Schmidt and Bannon 1992; Bannon 1995; Suchman 1995; 1996) is an indication of the complexity of imposing structure on 'work' tasks. There are difficulties trying to encode expertise and knowledge in an organisation's information system, which has to do with problems of collective meaning and understanding. As research in 'communities of practice' (Brown and Duguid 1991; Lave and Wenger 1991; Wenger 1998) makes clear, there is the obvious challenge of different understandings of symbols and so attributing different meanings, unless there is a shared sense of practice. There is the more subtle problem of not understanding the implications or significance of statements, even when the statement itself is understood. So, a sales agent may report that a customer did not reorder a product, realizing this means that the customer is probably looking for a new supplier. The sales agent considers this to be the obvious implication and that is the reason why the item is being reported; but the recipient of the information may not realize that the significance of this statement because they are not part of a sales culture or community of practice. How often do workers, trying to understand a work misunderstanding, end up with refrain "did you not realize that this meant"?

These problems limit the utility of remote data systems imposing structure on local work, but there are also problems which limit the extent to which information can be shared (regardless of the limited use which organisations can make of such shared information). These problems are similar to issues of trust and identity raised

earlier. In many organisations, individuals maintain private control over some personal knowledge. Originally, this desire for private control was explained as a way for individuals to maintain their intellectual capital (Orlikowski 1992), but there are many reasons why employees may wish to maintain control over who has access to their personal experience and expertise. It may simply be a question of trust -- will someone else use the information inappropriately and will inappropriate use rebound on the individual who provided the information (Kelly 2005). In organisations, as in the wider environment, there remain pressures for privatisation of information, which are in conflict with broad trends in uniform and shared information.

VI. Pervasive Information

The amount of information being captured as more transactions (business to business, business to consumer, government to citizen) become electronic has increased. With the easier exchange of information with the rise of interoperability, both of operating systems and of data formats (xml), this increase in information capture brings a significant reduction in individual privacy. Does it matter if the privacy of individuals is reduced in this way? For most people, it seems not to matter. Store loyalty cards can track the purchases of families: what is bought, when it is bought, and what else is bought at the same time. This enables companies to profile the families and then target them for advertising. Individuals who participate are rewarded with a saving of about one percent on purchases, which is their price for privacy. Records of mobile telephones provide accurate location records of citizens, especially as more and more individuals leave their phones on continuously. Closed circuit television converts public spaces into performance stages with surveillance providing the audience. Cameras track car movements in London, and other cities, so that usage charges can be levied.¹⁰ With data mining and profiling, not only are preferences and activities of individuals tracked, but they are matched by the preferences of other similar individuals. Thus, when the user orders a book or video online, he or she is presented with a list of books and videos that other users also bought. Our activities are recorded and aggregated with others, on a routine basis.

There is widespread acceptance of this surveillance society -- we take for granted CCTV coverage and the facility it provides for recording activities and thus being able to monitor activities that turn out to be illegal). Similarly, we take for granted location functions of mobile telephones. Increasingly, individuals leave their phones on 24 hours a day, effectively enabling a permanent tagging system, a system usually reserved for criminals (Richardson 1999; Bloomfield 2001).¹¹ Aside from a few people who complain about civil liberties and data protection, most people do not find this an issue. If anything, they are more likely to find it a reassurance; this is big brother, but with an ironic twist, because, for many people, it provides the comfort of a big brother. The fact that such benefits require a sophisticated system of data capture and analysis controlled by governments and multi-national information providers bothers very few people. Bentham's panopticon, where all could be viewed but without the observer being seen (Bentham and Bowring 1842; see also Poster 1990) has been achieved in ways that would have seemed extreme even in George Orwell's 1984.

VII. Governance

The increased ease of capturing and sharing information is a threat to individual privacy, and the personal information obtained in such a variety of

circumstances is stored remotely and its circulation is not under control of the individuals themselves. When data is often provided inadvertently by individuals, but captured and stored with the individual's awareness, then who actually 'owns' it? . Many jurisdictions have introduced legislation that give individuals rights with regard to information held about them. Many individuals have permanent email addresses which are hosted on sites outside their own control. How much privacy is possible under such circumstances? Data Protection legislation varies from jurisdiction to jurisdiction but, especially since, September 11th 2001, governments can obtain an increasing amount of personal information with reduced legal protection of individual privacy. With ownership of data can come profit as well as intrusion, but, in the new communications age, access to data becomes more important than simply possession data (akin to "if a tree falls in the forest and no one hears it, did it actually fall?"). These are policy decisions, but what is the future for policy inputs regarding such decisions?

In addition, there remains the potential for individuals' use of information to either participate in, or challenge, government policies, including those regarding data protection. Fundamental to this is the question of information being available to citizens. Loosely termed 'Freedom of Information', these laws usually enable individuals of obtain a copy of personal information held by any government departments, give individuals the right to challenge the information and have it amended if the information is wrong, and obtain reasons for decisions affecting themselves (for up-to-date reviews of FOI legislation in different jurisdictions, see <http://www.privacyinternational.org/>). Much of the information made available to individuals by organisations or states is selective - for instance, organisations often provide public access to some aspects of an internal information system in order to reduce their own work (real-time airline flight information and parcel tracking systems are obvious examples). However, there is other information that can be made available, at little extra cost, especially by governments. Most freedom of information legislation regulates not only personal information, but also 'public interest' information. This is information that governments obtain in order to help make decisions, or information about the way in which governments make decisions. Since governments are collecting information and making decisions in the names of its citizens, it is often the case that Freedom of Information legislation enables individuals to obtain such public interest information. Making such activities accessible to citizens makes the operations of government more transparent, and is intended to increase support for the process of government. It is a relatively inexpensive means of increasing citizens' sense of participation in government, since it is often just a question of making available to citizens information that is already available in electronic format to civil servants.

Governments have evidenced interest in various e-initiatives: e-participation, e-consultation, e-inclusion. However, while governments have employed new information and communications technologies to improve the process of government, these e-government initiatives should not be confused with e-participation, e-governance or e-inclusion, even though these are often lumped together (Organisation for Economic Co-operation and Development 2001; O'Donnell, McQuillan et al. 2003; Macintosh 2004; Komito 2005). All of these focus on a common concern with decreased assent by marginal groups to the existing power structures. Civic participation, glossed as individuals identifying themselves as citizens with a duty to act for the 'public good', seems to be in decline. This decline, particularly when expressed as decreased political participation, and evidenced by reduced voter

turnouts and a general alienation from government (van der Eijk and Franklin 1996; Blondel, Sinnott et al. 1998), form part of the 'democratic deficit' that has been on the agenda of many governments in recent years. It has often also been linked with a declining 'stock' of social trust, norms, and networks which people can draw on to solve common problems, commonly known as 'social capital' (Putnam, Leonardi et al. 1993; Putnam 2000).

Many governments have addressed this decline by attempting to increase public involvement in the formulation of government policy and the provision of services. This policy shift has been described as an increased focus on 'governance' rather than government (see Pierre 2000 for a general discussion of governance). Many governments, including European Union members states and the EU itself, have sought to use new information and communications technologies to increase public participation in dialogue, discussion and consultation. These projects have been described as 'eparticipation' or 'einclusion', and have included online forums, virtual discussion rooms, electronic polls and electronic voting. Reviews of these projects have indicated some success, but they remain pilot projects (Organisation for Economic Co-operation and Development 2003). There has been little evidence of new technologies emerging that encourage significant numbers of citizens to participate in policy formation. For example, while EU policies have been clear and detailed about improving governmental efficiency and service delivery through technology, the same can not be said of electronic governance or addressing the democratic deficit by improving public participation in the making of policy. A recent European Union policy document, "The Role of eGovernment for Europe's Future" (Commission of the European Communities 2003), could only propose that all eGovernment strategies should "promote ... online democratic participation".

It has been suggested that three general modes of civic participation in policy formation can be identified: information, consultation, participation (Organisation for Economic Co-operation and Development 2003; Macintosh 2004). At the most minimal level, technology can be used by governments to enable one-way information flows. In this mode, new technologies may be used as a mass media communication channel, similar to newspapers, pamphlets, radio or television, or narrowly directed at particular individuals or groups, but there is no scope for interaction. For example, local authorities and national government departments make information available, via web pages, electronic newsletters or even electronic mail, on a range of government activities, usually as part of an e-government strategy. Information is made available, as governments choose, on issues that governments choose, in the format that governments choose. A more interactive mode would be consultation, in which governments engage citizens, seeking their opinions on specific issues. This consultation can take place via electronic discussion lists, often web based. These forums, organised around policy issues, encourage citizens to indicate the extent to which participants agree with the proposals and why, perhaps enabling citizens to suggest alternatives. In the consultation processes, the issues are formulated by policy-makers, and citizens are restricted to responding to pre-selected issues, often in a predetermined manner. This is the electronic equivalent of a survey, and mechanisms include e-petitions and e-referenda, as well as developing online 'communities of interest' in which interested or selected citizens participate in structured discussions. Governments still determine the issues and the rules. Even less prevalent would be participation, where citizens themselves might determine the agenda, including issues and rules.

New technologies provide a cost effective means of promoting participation, but only with the proper policy support by governments. For instance, The High Level Expert Group on the Social and Societal Aspects of the Information Society (Commission of the European Community 1996), noted that “ICTs create new opportunities for greater public participation in and awareness of the political process”, but also warned that “the increase in the flow of information does not necessarily engender an amelioration of the democratic system. It could just as easily lead to a distancing of citizens with regard to real democratic stakes”. Thus, the policy decisions of governments will determine whether new technologies foster greater participation or provide additional barriers between citizens and states.

Evidence that new technologies are encouraging greater political participation in policy is difficult to find. One of the earliest experiments in the use of technologies to enhance public participation at local level was in Santa Monica in 1989 (Docter and Dutton 1998), and it was one of a number of experiments in community building using new technologies (Tsagarousianou, Tambini et al. 1998). In many of these studies only a small percentage of the local population used the technology, so it has been difficult to make extrapolations about technology, community and participation. Determined individuals can obtain useful information, especially through FOI, that can be the basis for political and policy pressures (especially when combined with the increased ease of co-ordinating individuals’ activities via Internet and mobile phone technologies). The effective use of new technologies by voluntary groups is evident throughout the world; social movements use new technologies to organise internally and challenge existing government policies and even government structures (see Melucci 1996 for a discussion of social movements; Della Porta and Diani 1999). Anti-globalisation protests, usually timed to coincide with meetings of either the World Trade Organisation or the G7 group of nations, are obvious examples of such movements (for a review of cases, see Johnson and Bimber 2004; Kahn and Kellner 2004). These groups, however ephemeral, have ‘real space’ manifestations in concrete political actions, which disrupt activities and claim headlines, and mobilize people across nations (see Surman and Reilly 2003). These groups challenge the existing rules and agendas; they is less evidence of governments encouraging groups and individuals to participate in the determination of those rules and agendas.

The one area where the proliferation of information is having an increasing impact on political policy is through traditional elections. New technology has increased the efficiency and reduced the cost of opinion polls, so political parties can gather, input, and process survey data at great speed and little cost. During elections, political parties commission private surveys to gauge public opinion and alter policy in response to public opinion. New technology can also be used by citizens to contact politicians, which facilitates debate and discussion. Political parties, as well as politicians, now have email addresses as well as response forms on web pages, so that voters can make suggestions or respond to statements from political parties and politicians. These communication channels are a supplement to the traditional ones of personal visits and phone calls; although there is some evidence in the United States of new communications technologies replacing traditional means of mobilizing supporters. Democratic presidential candidate Howard Dean, governor of Vermont, has been depending on new technology in his campaign for nomination in the 2004 Presidential election. He has used a web site to raise two-thirds of his initial funding of seven million dollars, and supporters have been using geographic based software to enable people to find other supporters in their local area, so they could meet face to face and organise themselves locally (Butcher 2003; O'Brien 2003). These tactics

have brought significant cash contributions and mobilised a relatively large number of potential supporters. Early indications are that such techniques are becoming more important in mobilizing voters. In 2003 it took Howard Dean six months to compile an email list of 139,000; in less than two months Barack Obama has gathered more than 310,000 supporters on Facebook.com.¹² Voters themselves are obtaining political information via the Internet, at least in the United States (Raine and Horrigan 2007). The long-term impact remains to be seen, but while new technologies may be integrated into traditional political processes, there remains little evidence that voters feel strongly enough to want a policy input on many specific issues. For the rest, they are content to let others (political parties, interest groups, and so on) make the policy decision (c.f., Birrer 1999).

VIII. Digital Divide

The phrase ‘digital divide’ has been coined to focus on those who do not have access to information, and so are excluded from participating in either the Information Society or new Communication Society, even though their movements and activities become part of the world of data swirling around this new society. Participation requires citizens to have access to the Internet. Although all governments have invested in new technologies to improve internal transactions and service delivery, it is less clear that governments support the use of new technologies in order to encourage citizens’ participation in policy formation. Either they can not afford to buy computers, can not afford to use them due to high telecommunications costs, or do not know how to use computers (Birdsall 2000; Sciadas 2002; Haase and Pratschke 2003; Lenhart, Horrigan et al. 2003; McCaffrey 2003). Even when people can afford a computer, charges to use a telephone line or high-speed data line in order to access the Internet may be a barrier to use. In some countries, this issue does not arise, as there is a flat rate charge for all local telephone use. But, in countries where even local telephone calls are charged individually, cost is a potential deterrent. This issue has been faced before. The economic cost of posting a letter varies, depending on location. Such services are more expensive to operate in low-density rural areas, and so the economic cost of posting a letter from a rural area to another rural area is much higher than posting a letter from an urban area to another urban area. However, when postal services were introduced, a policy decision was made that it should cost the same to post a letter, regardless of the location of sender or receiver. Despite variable actual costs depending on location, the cost to the consumer is the same, and the higher economic costs of posting some letters are shared by all. Similar issues arise in the provision of telephone services and transportation services such as buses and trains. In some cases, the cost remains the same, with cheaper service locations subsidizing more expensive service locations. In other cases, the government subsidizes the cost to all consumers because access to such communication and transportation services is seen as a right to be availed of by all citizens. Similar decisions have to be made regarding telecommunications charges: is Internet access important enough that governments should ensure that everyone can afford access to the Internet, whether by subsidizing the cost or spreading out the cost amongst all users?

If governments wish to provide access to information, then they must provide support for individuals who purchase computers by providing grants or tax relief. Very few governments provide state support for such access, instead presuming that market forces and competition will enable individuals to purchase the computers and telecommunications links necessary for access to such information.¹³ They also hope

that the other benefits of home computer ownership (especially entertainment) will provide sufficient incentive for computer purchase. If governments will not subsidize purchase and access, should governments provide inexpensive public Internet access for those who cannot afford the cost of buying and using a home computer? In the past, as books became an important means of distributing information, those who could not read and could not afford to buy books were excluded from such information. The dual solutions were to fund literacy programs and, more importantly, to invent and then fund the public library. The public library was a revolutionary idea: those who could not afford to buy books should have the entitlement to borrow a book, thus ensuring that everyone had access to information. Many governments have followed a similar line, by funding computer literacy programs and enabling those who cannot afford to buy a computer to have the right to 'borrow' a computer, or at least borrow access to a computer. In many cases, this right is exercised in the same way as the right to books, and public libraries enable people to 'borrow' computer time just as they previously borrowed books. However, the analogy to borrowing books for a library is, in fact, a flawed analogy. A more appropriate analogy would be reading reference books in a library that can not be taken home; it is clear that going to a public location to access a computer will be used only for very specific purposes by those with very great need. Providing public access points is not a satisfactory way of providing universal service access, if such access is deemed to be a civil right. The cost of infrastructure in rural locations without sufficient population density to make provision economically viable remains a problem, unless governments take a policy decision that, like telephones or letter post, there is a universal service obligation to provide digital access for individuals. Many governments do make such a policy decision; Canada's Community Access Program (<http://cap.ic.gc.ca/>) is one such example. But many others do not, with a significant societal cost, in terms of rural social life. Peripheral areas that do not have telecommunications access to information due to poor infrastructure are still vulnerable to decisions made by organisations due to commercial pressures. As organisations try to reduce their costs, new technologies replace labour in rural branches, leading to closures of local services such as banks and post offices, which increases social isolation in such areas.

Despite the uneven support by various governments, barriers to access are diminishing over time (National Telecommunications and Information Administration 2002; International Telecommunication Union and Minges 2003) and the use of technology has been steadily increasing. Education remains an issue, as shown by a recent study of Internet use by Latin American minorities in the US found that differences in levels of education and English proficiency explained much of the difference in internet usage between Hispanics and non-Hispanics (Fox and Livingston 2007). Another barrier has been age¹⁴. To some extent, these are both proxies for the traditional difficulty that many experience learning how to use a computer and how to access the Internet (although lack of interest and perceived relevance is also a factor, see Wyatt, Thomas et al. 2002). As computers and operating systems become sophisticated, accessing the Internet and using Internet applications such as web browsers has become easier. The move from a command line interface MS-DOS to point-and-click graphics user interface has eased matters, but at a cost: the easier the interface for the user, the more complex the computer programme and the more expensive the hardware. The computing power necessary for current operating systems requires not only an initial financial investment, there is also the hidden cost of maintaining and upgrading both hardware and software. Current operating systems require complicated links between components, and anything that

goes wrong is far beyond the competence of even sophisticated users. It is striking that the enhanced security features that an integral part of Microsoft's newest operating system (Vista) presume that individuals do not possess sufficient knowledge to safeguard their own computers from criminal intrusion and high jacking, and, even if they did, can not be trusted to implement such safeguards. This dependence is built into the operating system and most software, because users depend on easy to use menu options in order to use their computers. This ease of use comes at a cost, because such menus restricts choice to what has been designed in advance. Personal computers, which had been originally expected to increase individual autonomy and choice have now become agents for restricting choice to those options permitted by the multi-national organisations that design both software and hardware.

IX. Conclusion

In the early days of personal computers and again in the early days of the Internet, rhetoric focused on slogans like 'information is power' and there was a widespread assumption that these new technologies would enable greater individual freedom. Perhaps this was, even in the beginning, more hope and hype than reality, but this dualism has underpinned much of the discussion about the Information Society (e.g., Robins and Webster 1999; May 2002; Komito 2004; Webster 2006); once again, history repeats itself. The current hype about Web 2.0 and the revolution of user-generated content and social networking sites diverts attention from quite different, but parallel, processes underneath the surface: increasing surveillance and decreasing privacy. Recent technology changes have facilitated 1) an increase in the amounts of data routinely captured or actively contributed and 2) the storage of that data on computers not controlled by the individuals linked with the data. There is little evidence that individuals are aware of the extent to which these changes have enabled increased routine surveillance of individuals and a diminution of personal privacy. Sales of consumer paper shredders may be increasing¹⁵, but this represents a treatment of the symptoms, not the disease. There is need for far greater discussion and debate regarding increased surveillance and decreased privacy.

¹ for an early discussion, see O'Reilly (2005).

² <http://news.bbc.co.uk/2/hi/technology/6129496.stm>

³ http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/magazine/4782118.stm

⁴ <http://www.washingtonpost.com/wp-dyn/content/article/2006/04/03/AR2006040301692.html>

⁵ http://www.theregister.co.uk/2006/08/30/myspace_teen_data_hacked/

⁶ Single sign-on is a software authentication that enables a user to authenticate once and gain access to the resources of multiple software systems by passing all authentication to a trusted central server or servers.

⁷ For a recent discussion of debates about data mining and personal data protection in the United States, see http://news.com.com/2100-1028_3-6149118.html

⁸ Even if the consequence is sometimes that individuals now print the documents they receive electronically, instead of receiving the document as a printed artefact (Brown and Duguid 2000).

⁹ Although research very quickly indicated that technologies did not necessarily changed organisational structures (Kling 1996).

¹⁰ <http://www.cclondon.com/Penalties-Enforcement.shtml>

¹¹ For a recent news report, see http://news.bbc.co.uk/hi/english/static/in_depth/uk/2001/life_of_crime/e_tagging.stm.

¹² Gary Younge; Monday March 5, 2007; The Guardian. <http://technology.guardian.co.uk/opinion/story/0,,2026756,00.html>

¹³ The French Minitel experiment is an interesting exception. Minitel terminals were provided free, as part of an early e-government strategy to reduce paper phone books and enable electronic

payments to the French government, it quickly became a basis for discussion groups and information exchange among French citizens (de Lacy 1989; Cats-Baril and Jelassi 1994).

¹⁴ see <http://technology.guardian.co.uk/news/story/0,,2035468,00.html> for a UK example, as well as <http://www.info.gov.hk/digital21/eng/digitaldivide/ch2.html> for a Hong Kong illustration

¹⁵ One company reported that shredder sales grew 25% in a single year (http://www.redcoatpublishing.com/spotlights/sl_09_04_Fellowes.asp).

X. Bibliography

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