

Information policies: yesterday, today, tomorrow

ELIZABETH ORNA

Abstract

This article presents a brief history of the development of ideas about national and organizational information policies, from the first establishment of a UK Ministry of Information in the First World War to the present day. The issues and tensions that have characterized attempts to develop and implement policies on the national and organizational scale are discussed, with particular reference to: the power relations between the parties to them; the relative significance accorded to information technology and information content; the transition from formulating policy to acting on it; and the threats to the survival of those policies that get as far as implementation. In conclusion, the contribution to date of information science to the theory and practice of information policies is assessed, and suggestions are offered on directions for future efforts, in the light of the past of this interesting field.

Introduction

I have to begin this article with a confession: up till now, I have always avoided writing about national information policies. Over the years, I have read much of what others have written on the subject and admired a good deal of it; but in my own work I have concentrated on trying to help organizations to develop information policies for themselves, by working with them and writing for them. It offers some chance of producing at least some visible effect within a reasonable time, while observation suggests that governments do not take much notice of what information scientists write about national information policies, even on those rare occasions when they actually invite their advice on the subject.

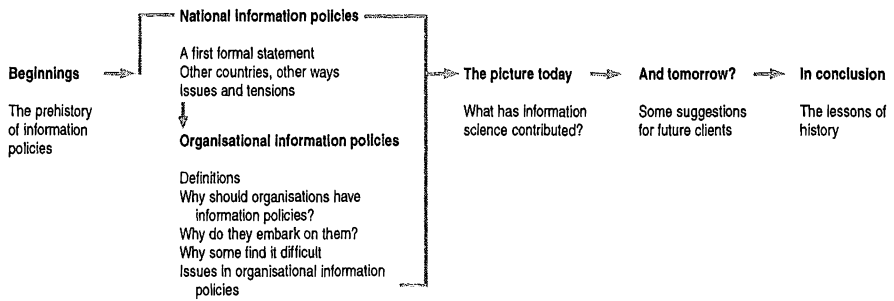


Figure 1 The shape of the story

So when I was invited to contribute a paper on information policies to this special issue, my first inclination was to write only on organizational policies. But when I started re-reading the literature and thinking about the article, it became clear that national information policy was the essential context for organizational policies and strategies, which could not be properly understood without it.

Tackling the subject I had tried to avoid turned out to be worthwhile, because I began to see a coherent story, with some dominant themes that relate these two aspects of information policy. The next problem was how to tell the story: it was obvious that it had to be a chronological account, but within that, was it possible to intertwine the two strands within a single narrative, or would there have to be two separate stories, with the links between them made clear during the telling of each? For clarity, it had to be the latter, and this is how the article is organized (see Figure 1).

There is one other thing to explain before I leave readers to get on with it. This special issue seeks to review the development of the whole information science field, so the individual contributions cannot be exhaustive surveys; they are articles, not definitive comprehensive works on their subjects. This article has certainly had to omit some topics that would find a place in a comprehensive study and to deal with many others in summary form. I hope that the references to other sources go some way towards making up for this.

Beginnings: the pre-history of information policy

Governments first began to be concerned with the idea of ‘information policy’, in the modern sense of the term, some time around the late 1970s and the early 1980s (e.g. Moore and Steel [1]; Rowlands [2]). The earliest use of

the term 'Information policy' in relation to governments, however, goes back to activities that began under the name of propaganda in the First World War.¹

The UK Government set up a Ministry of Information in 1917; it was dissolved in 1918, but re-established the day after the Second World War broke out in 1939 (National Archives [3]; Clark [4]). Its role in that war covered news and press censorship and home and overseas 'publicity'. Wound up in 1946, it was replaced by the Central Office of Information (COI)[5] which today defines itself as 'the Government's centre of excellence in marketing and communications'.

In the USA, a parallel body – the Office of War Information – was set up in 1942 (US National Archives and Records Administration [6]). It established a Joint Committee on War Information Policy with the UK, which was dissolved at the end of the war.

After that point, developments in the two countries diverged in an interesting way. While in the UK the COI continued to be the government's instrument for telling the home and overseas world what it wanted them to know, by the early 1960s thinking in the USA had moved to topics that have become central to national information policies as defined today: in particular, access for the public to government information it wants, rather than what government thinks it ought to have; and protection of personal data gathered for state purposes.

On the first, Rourke [7] writes of executive officials concealing information from elected representatives and the public, and of some Congress complicity in the practice. He concludes that 'the tradition of disclosure might wither in the shade of administrative evasion or inertia were it not for the continued exercise of outside vigilance' [7, p. 694] (a lesson that is being re-learned in the UK since its Freedom of Information Act of 2005 nearly 40 years after the US Act of 1966).

And on the second, Dunn [8] contributes prescient and still relevant reflections on the inevitable tensions between the collection of statistical data about the population for policy decision-making, and the protection of individual privacy (this was in the context of alarmist press and public response to his 1965 proposals for a National Data Center). He explains the distinction between statistical information systems that are concerned with the 'public face of the individual' and intelligence systems that seek information about individuals as individuals. It is an oversimplification to see the former as a contest between government and individuals: 'the conflict is between conflicting aspects of our own individual personal interests [...]

Information is power, but both information and power are morally neutral – each has the ability to enslave and to release, and the important thing is what standards serve as our guide as we attempt to strike the balances and re-strike them every year’ [8, p. 26] (Dunn also disposes in this article of already prevalent myths about the power of computers to perform wonders ‘at the touch of a button’).

One other element in the earlier history of ideas about information policy should be mentioned here: the strand concerned with scientific and technical information, which contributed both to the concept of information policy and to the development of information science. The name of J.D. Bernal, crystallographer and Marxist, is particularly associated with it, as described by Muddiman [9].

While Bernal’s ideas on ‘planned science’ dedicated to peace, welfare and the benefit of humanity, as set out in his 1939 book on *The Social Function of Science* [10], did not prosper in the climate of the Cold War, his perception of the importance of scientific communication, supported by user-centred systems of information management, did take root. That aspect of his ideas found a welcome among the professional information community in the 1950s and 1960s, when he was a respected member of Aslib Council.

Muddiman sums up his achievement as a ‘Red information scientist’: ‘He inaugurated the serious discussion of science policy in Britain, anticipating the development of policy studies in the information sphere ... Throughout his information career, Bernal insisted that documentation and communication were at root social, rather than technological, phenomena. Of all the early pioneers of information science, it was thus perhaps Bernal who ensured that the new profession recognized the social dimensions of its discipline’ (see also Vickery [11] for an informative and sympathetic account of Bernal’s views).

The end of the 1960s marks the transition to the characteristic modern concerns of national information policies. They are outlined in the next section.

National information policies

By 1970 most of the elements that make up the contemporary idea of national information policy had emerged: what governments tell their own population and those of other countries for their own policy purposes; protection of personal data and freedom of information; collection of statistical data for policy-making;² and the use of ICT to manage and analyse information.³

From that time on, it has received progressively more attention, with a variety of approaches, in the USA and the UK and elsewhere: from governments; and from researchers, in the LIS and other academic communities, and in the ICT industries.

Researchers have proposed retrospectively various reasons for the attention paid to national information. Rowlands [2, 13] puts it down to the challenge to established policy and regulatory order posed by large-scale electronic data-processing that affects civil liberties, confidentiality, access to government information and national security. Moore and Steel [1] explain it in terms of a response to pressures of competition and constraints on resources. Maceviciute and Wilson [14] write of information being recognized as a national resource that requires management, and Rowlands too refers to the perception that it is a national resource, which can bring economic, social, and cultural benefits [2].

A first formal statement

In 1976, a first formal statement of National Information Policy (the Rockefeller Report [15]) appeared in the USA, in response to a Presidential Directive (from Richard Nixon, though by the time it appeared he had been replaced by Jimmy Carter). Published by the National Commission on Libraries and Information Science, which had been closely involved in its preparation, it recommended that the USA should develop a coordinated National Information Policy, managed centrally and supported by an advisory committee representing the private sector, local government, and the academic and professional disciplines concerned with the issues discussed in it. The report gave a clear and comprehensive statement of those issues, from the impact of ICT and its potential for shaping the quality of decisions, to post-industrial society and its influence on the economy and employment, and existing legislation on freedom of information (1966) and privacy (1974).

The scope of the Rockefeller Report matches well with Oppenheim's [16] definition in 1994 of national information policy as a series of decisions taken by a national government, which are designed to encourage a better information infrastructure. But by the time that definition was published, things had changed in the USA, and Oppenheim continues: 'Some countries [...] have explicit information policies; others, including the USA and the UK, do not. Often (as in the UK) the policy is to have no formal policy and to leave it to the marketplace [...] several countries without clearly stated information policies – the UK, the Netherlands, the USA – have strong

information industries. This raises the question whether such a policy is needed' [16, p. 143]. Hill [17] summarizes the situation on similar lines – and indeed explicitly contrasts the mid-1990s situation with that in which the Rockefeller report was published.

Those observations point in two directions: to the range of approaches in different countries, and to issues and tensions characteristic of national information policies – especially those which are not explicit and not formalized.

Other countries, other ways

While the goals of information policy are similar in many countries, the mechanisms chosen to achieve them, as Moore [18] observes, vary widely. Moore [19], like Oppenheim, identifies two broad models of national information policy: 'laissez faire', in which the state leaves most responsibility to the market; and 'dirigiste' which places more emphasis on the role of the state as participant.

Writing specifically of East Asia, Moore [18] describes its governments as relying on partnership between the state and the private sector, and argues that the 'evidence seems to suggest' that this model is more likely to be successful, especially for small countries, whose ICT infrastructure can be viable only if it occupies a monopoly position. For this reason, in East Asia, the state retains ownership of infrastructure but encourages competition in construction and operation.

The same author [20] also points to different national approaches that cut across the East/West division, citing: policy development by the executive branch of government (Scandinavia, Japan, Singapore); delegation to an advisory body of experts from the sectors that will be most affected by changes (Sweden, Canada, Australia); and a combination of these two, leaving the executive responsible for developing policy (European Union, USA). On this analysis, the UK differs from all these, by relying on informal and piecemeal 'muddling through', which makes it impossible to point to a single document that describes what British national information policy encompasses.

Muir and Oppenheim [21–23] make similar points in a series of articles on worldwide developments in national information policy.

Issues and tensions in national information policies

Governments of all kinds encounter inherent problems in the field of national information policy. Those problems interact with political, economic, social and cultural factors, which influence how governments respond to them, and the response changes over time. The main issues relate to: the nature of information itself, power relations, and the economic issue of market orientation vs public good.

The nature of information itself

Oppenheim [16, p. 141] suggests that governments find it difficult to get to grips with information policy because they have a problem with defining information, which arises from the fact that it is dynamic and innovative, and has social and economic implications – all of which make it hard to handle. That difficulty is not limited to governments.

Power relations

Information policies, on both the national and organizational scale, entail relations between groups of people who are parties to them in some way. There are differences in the relative power enjoyed by the various groups, as between, for example: individuals/organizations subject to legislation which is part of the policy, and the government which determines the policy; vendors of ICT solutions, and those who have to use them in the organizations that purchase them; industries with a commercial interest in exploiting scientific research, and supporters of free access to it.

As we have seen, one approach open to governments is to hand much of the power of policy making to the market, which is what the British Government has done fairly consistently for many years. Oppenheim [24], in evidence to the House of Lords Enquiry into the Information Superhighway, characterized the UK government approach as a ‘consistent policy that competition in the open marketplace’ and the de-regulation of telecommunications will deliver the technology which will create ‘lasting, highly paid jobs’.⁴ As against that, Oppenheim argues that any UK government policy for developing the ‘information society’ should make a single cabinet minister responsible; there should be agreed policies for government websites across all departments, and means to allow all citizens and communities access; and copyright law should be revised to achieve a

consistent balance between the needs of creators, owners and users, and fair dealing with machine-readable data. Copyright law should not extend to materials produced by government.

Brown [25] describes Australian government responses since information policy became an issue in the late 1960s as 'piecemeal, sporadic' and reactive rather than systematic. She identifies a significant change in government thinking at the time of writing as a 'growing realization that powerful stakeholders have stolen a march on the citizens at large ...', creating rising anxiety about privacy and security and the increasing influence of ICT in daily lives. In a continuation of the article [26] she observes that 'so-called Information Society politics'⁵ are 'not concerned with [...] the needs of individual users'. Information is a means to an end; a tool to be used for government purposes.

Oppenheim wrote in 1994, 'While in theory IT is a benign technology offering rewards to all in society, in practice the implementation of information technology tools tends to exacerbate the difference between the information rich and the information poor' [16, p. 134].

Horner and Day [27] provide a rare example in the LIS literature of the response of trades unions to the microelectronics revolution of the 1970s and 1980s. Attempts to negotiate new technology agreements were submerged in the Thatcher government's assault on unions in the 1980s. The authors' view is that 'In the longer term, the need is to deconstruct the assumption of ICTs' neutrality and to see them as inherently designed around management strategies. Such strategies are themselves set in the context of essentially antagonistic relations of production.' They accurately foresaw 'increasing casualization of the workforce' [27, p. 334]. This industrial relations story is still being played out today, with the unions in a weaker position than when the article was written.

Marcella and Baxter [29] in a report on the findings from a citizenship information research project conclude that there is a real danger of class-based exclusion from access to information, from the technology used to access it, and from awareness of what the exclusion deprives them of.

The Institute for Public Policy Research manifesto for Digital Britain (Davies [30]) repeats the earlier examples of power inequalities. It warns of the dangers inherent in 'overemphasis on micro-delivery challenges in areas such as e-government' in which the political nature of policy choices goes under-appreciated. The UK's enviable ICT infrastructure is not matched by 'skills or imagination to use it effectively', while emphasis on the 'knowledge

economy' and generalized claims about the 'impact of ICT' have both 'outlived their usefulness'.

Government awareness of Web 2.0, which seems to have dawned in spring 2007, may possibly have brought a change of heart. An independent review on *The Power of Information* (Mayo and Steinberg [31]) commissioned by the British Government, sets out opportunities for co-operation between government and citizens in generating and using information now that people who were formerly limited to the receiving end are becoming skilled in using, re-using and creating information in new ways. The review recommends that government should work with user communities whose goals 'align closely with those of different parts of government' for common social and economic objectives; provide innovators who re-use government-held information with the information they need; and prepare citizens for a world of plentiful (and sometimes unreliable) information and help excluded groups to take advantage of it.

The Government response [32] was unusually positive; it accepted most of the report's recommendations, including:

- Developing experimental partnerships between major departments and user-generated sites in key policy areas.
- Consulting operators/users of existing user-generated sites before building its own versions, and modifying government services to complement citizen-led endeavours.
- Promoting publication of regulatory information, and encouraging its publication in open formats under licences permitting re-use.

Market orientation vs public good

There is what Koenig [33] describes as an 'under-recognized' tension between those two views of information. On one hand, information 'doesn't exist in any meaningful sense in a wild state' so ownership should be vested in the creators, distributors, etc. who added the value by putting it into products/services. But on the public-good side, its unique characteristic is that it can be replicated or disseminated at costs that are marginal compared with those of creating it; and that leads to the argument that 'society would be daft' not to encourage the widest/cheapest distribution possible. He observes that changes in IT, from the early 1990s on, both strengthen the argument for the public-good view, and drive forward competition in using IT to create and manipulate information,

with tension among stakeholders fiercer than ever before. An accurate prediction; and the tension is still with us.

Moore [34] examines the contradictory goals of de-regulating the telecommunications market and universal access to high-quality telecoms services. He attacks the implicit assumption that 'Information provided free at the point of use represents a distortion of the real market' as an oversimplification; and argues that we need to understand better how markets for information work, appreciate their limitations, and develop policies to support free provision of information at the point of use where appropriate, 'while using conventional market mechanisms elsewhere'.

The British Government response [32] to *The Power of Information*, described above, recognizes these arguments and partially accepts the recommendations on changing the current charging model for re-use of public sector information and regulation of the public-sector information market, which, however, require 'further consideration'.

Technology- or information-led

From the time when the potential of IT for handling and manipulating information became evident, it has exerted an irresistible attraction on the thinking of governments about information policy, which has all too often relegated actual information to a lowly supporting role.

In the UK the disproportion has been commented on and complained of from the start, and still is today; de Saulles [35] for example objects to 'e-government' policies biased towards IT and 'communication' aspects rather than actual information. Current aspirations to shepherd the 'customer' population towards electronic interaction with government information are under the rubric of 'transformational government'. The relevant publications do not actually say who or what is to be transformed, but the stated aim is to rationalize the use of the web by government departments in order to deliver 'customer-centric' services (Cabinet Office [36]). There is much ground to make up in respect of both parts of that aim. Deficiencies in the necessary professional skills in IT procurement and project management, compounded by 'ten or more years of uncoordinated growth of government websites' are recognized by the National Audit Office (NAO) [37]. Steps to rectify the situation include a Government IT academy and establishment of the Chief Information Officer as a 'board-level position' (Cabinet Office [36]).

Less detail is available on how the actual information content presented on rationalized websites is to become more customer-centric. While the NAO reports that focus-group participants have found the websites of government departments and agencies 'complex [...] with information useful to them hard to find amongst large amounts of policy material and official documentation', dealing with those difficulties is discussed primarily in aspirational terms: the vision in the *Service Transformation Agreement* (HM Treasury [38]), for example, is of future services that will be 'better for customers [...] simpler, more streamlined and intuitive, more accessible and convenient'.

The NAO's recognition that not everyone can use the internet, and that exclusion is highest among elderly people and those on means-tested benefits, is welcome, but they are likely to have a long wait before they benefit from 'money released from improved efficiency'. The task described as 're-ordering information to make it easily findable; re-presenting [it] so that it is clearer and makes sense for citizens or businesses' and 'joining [it] up effectively' is as demanding as rectifying past neglect of essential IT expertise; but there is no indication of comparable investment in it, and apparently no recognition of the professional skills and knowledge it requires. It would be interesting to have an update of the survey of internet and intranet use in 23 government departments made in 1999 by the Committee of Departmental Librarians (Cumming and Cuthbertson, [39]). At that date, in 68 percent of the organizations surveyed 'libraries had no input at all into the websites, even information management and indexing were usually left to IT or other sections', and the authors note the 'predominance of press and publicity sections in managing government websites' in contrast with academic institutions.

Although the British government seems now to be moving towards a better understanding of how human beings (including civil servants) and ICT can work together in generating and using qualitative as well as quantitative information, the transformation should probably not be expected any time soon, and it certainly will not be of the kind achieved at the wave of a wand.

Government and research

In the light of this short history there is little reason to be surprised by the way governments treat research they themselves have commissioned (including non-use and non-publication); by the 'difference between the information,

advice and research that policy makers seek and that upon which they act' (Strachan and Rowlands [40]); or by Oppenheim's [16] observation that there is virtually no input from information professionals into government policy-making. It is a pity none the less that governments have not taken the view of information-policy making proposed by Rowlands [2], as a process of negotiation, 'bringing together competing value frames and resolving conflicts'.

From formulating the policy to managing action

The transition from formulating policy to implementing it is another can of worms (as the UK Government has found, for example, with its Freedom of Information Act, which has created similar problems to those that arose in the USA 40 years earlier). The forte of politicians is in issuing policies, or directives to establish policies. In the nature of things they can have little conception of the work of the real human beings who have to wrestle with putting into practice the stream of policies and initiatives. Here are two examples of what it entails.

The first comes from a government department (the Department of Trade and Industry (DTI)). MacLachlan [41] writes from long experience of developing information management in the Department, starting in 1989, when the Cabinet Office recommended government departments to develop an information policy and audit their information resources. A first version was written in that year, and it was revised in the light of experience in 1993. By the late 1990s existing systems for managing internal information were under strain; and a new initiative on modernizing government from the Cabinet Office, with the then fashionable key theme of sharing information and knowledge, required all records to be made available electronically by 2004. This led to setting up a DTI working group on information architecture; as well as taxonomy, metadata standards, thesaurus, procedures etc., its programme included another revision of information policy. The revised policy set out seven principles governing how the Department would manage information; defined the types of information it covered, and the policies for security, versioning, modification and disposal, intellectual property, information management responsibilities etc.; and set out explicitly how information should be managed and by whom. At the time of writing (in 2004) MacLachlan was able to state that they had 'begun to develop both a recognition of the relevance of information management and some skills in the

DTI user population'. A modest claim, and it had taken consistent work by committed people over 15 years to reach that point.

The second example comes from the CRM (customer relationship management) National Project, a £4.275m initiative led by the London borough of Tower Hamlets, launched in 2003 to 'bring clarity and definition to the role of customer relationship management in local government'. The project, which was embedded in an initiative from the Office of the Deputy Prime Minister for a National Strategy for local e-government [42], included as one element among many a model information management policy for local authorities. While CRM was described in an introductory presentation to 'e-champions' in 2002 as 'More than IT – a philosophy and approach [...] – A fundamental change (transformation) to put the customer at the focus rather than the product or service', IT and the introduction of e-government seem to have been the main message that local authorities got.

A search for the model information management policy for purposes of this article led into quite a labyrinth. One of the participating councils, Salford [43], described on its website (last updated April 2004) the 'tremendous progress' made by that date, including 'clear standards and guidelines for [...] information management'.

Salford was also involved in setting up a 'CRM Academy' to offer independent advice. A search of its site [44] for information management policy produced only entries from vendors recommending their CRM systems.

Websites quoted by a participant in the development of the policy model (Budzak [45]) can no longer be accessed. The Local e-Government Programme [46] officially closed in April 2006, though the site continues to offer advice; a search for information management policy provided only two results, both referring to a protocol for establishing a consistent approach to management of Freedom of Information Act requests.

Another participating council, Brent, refers in its IT Strategy 2007 v1.4 [47] to 'A new Information Management policy [which] will bring structure and clarity to the wealth of information we hold so that all staff have access to a deep and resource-rich pool of knowledge.'

But that is as far as I could take the search in the time available; I am sorry it did not lead to the model policy on which Brent's path to its deep pool of knowledge is presumably based.

Organizational information policies

This is a shorter story than national information policies, and its telling is based in part on personal experience. Organizational information policies seem to date back only to the early 1980s, and they have received less attention than national from both researchers and practitioners. As observed by participants in a 1996 British Library workshop on information policies (Rowlands [48]), this was a key area of information policy that had not been explored to any depth. I became aware that this was so in 1980, when embarking on my first attempt to articulate the idea and to design a policy for an organization (Orna and Hall [49]).

Brown [25], like the participants in the British Library workshop on information policies, argues that the definition should cover both national and organizational forms, and that organizational information policy merits study – though a distinction should still be made between the public and corporate spheres. She considers, however, that it should be studied, ‘not with reference to the organization itself but in the way it interacts with, and influences direction in, public policy.’

That interaction is indeed important, but the emphasis here will be rather different. It is based on the reflection that the task of putting national information policies into practice has to be carried out by government departments, and what are they but organizations of a specific kind? As such they are a point of intersection between national and organizational information policies, and in my view, the specific context of ‘the organization itself’ is the most appropriate way into organizational information policy.

Definition

Orna [50] and [51] defines organizational information policy as a policy ‘founded on an organization’s overall objectives and the priorities within them’, which ‘defines, at a general level: the objectives of information use in the organization, what “information” means for it in the context of whatever it is in business for’, and the principles on which it will manage information, employ human resources and technology in using it, and assign a value to it.

An information policy is ‘a dynamic tool’, which can be used as the basis for developing an organizational information strategy; and which can ‘relate everything that is done with information to the organization’s overall objectives; enable effective decisions on resource allocation; promote interaction, communication and mutual support between all parts of the

organization, and between it and its “customers” or public; provide objective criteria for assessing the results of information-based activities; {and} give feedback to the process of developing corporate policies.’

Why should organizations have information policies?

On that definition organizational information policies and strategies are meant to be used, and not as objects of contemplation but as a basis for action. They have been commended to organizations both for avoiding risks (financial losses from incomplete and uncoordinated exploitation of information, wasted time, failures of innovation, and reputation loss); and for positive benefits, including negotiation and openness among those responsible for different aspects of information management, productive use of IT in supporting staff in their use of information, and ability to initiate change to take advantage of changing environments (Orna [50]). These reasons have similarities with the ideas advanced by Itami [52], Nonaka and Takeuchi [53], Davenport and Prusak [54, 55], and Marchand et al. [56], and are much influenced by their thinking.⁶

Why do they embark on them?

Different organizations have embarked on information policies from various situations. Many were forced into it by external economic pressures; Moore and Steel [1] are among those who describe the recession of the late 1970s and early 1980s as causing businesses to change their view of information services, and see them not as overheads but as important corporate resources with potential for helping them to survive economic storms.

Others came to it on the basis of thinking about their existing experience of information use, with the aim of bringing greater coherence to things they were already doing, benefiting from experience, dealing successfully with changes on the horizon and achieving desired innovations, and with clear ideas of how to use the information policy and who would be involved in the process. (This was certainly the case with at least one major company in the pharmaceutical industry, which, as described in Orna [57], gave a lead in developing information policies.)

The outcomes differed accordingly. Van Mesdag [58] for example describes firms under economic pressure, without an integrated approach to information, responding by buying tools to ‘collect, process, store, retrieve

and present information' but without having thought about where to get information to put in the store or the objectives of outputting it. Neyland and SurrIDGE [59] tell of the uncomprehending response of some British universities to the JISC requirement to develop an information strategy. One British university had a five-year-old information strategy document that had never been acted on, another an Information Strategy Committee of the same age that had never produced a strategy.

Surveys of business over the period from the mid-1990s to the present suggest a similar picture of points not quite grasped. A telephone survey of a random sample of nearly 1000 chief executives in the UK (Baxter [60]) showed that while 60 percent claimed their company had a strategy/policy for information management, only 20 percent were aware of the company having an overall information budget; half had no formal information provision; and the majority did not know who was responsible for the information resource.

Nearly 10 years later, information professionals showed up little better. In 2005, DocuMation-UK, supported by Vignette (vendors of integrated document-management systems) surveyed 119 information management and IT professionals. Over 44 percent of respondents reported that their company was without a document and information-management strategy. While nearly all respondents thought information management was important to their organization only 42 percent of them were aware of any regulations or legislation relating to business information management that affected their work directly [61].

More encouraging examples come from organizations in both public and private sectors that are concerned with managing information by the nature of their business;⁷ have worked their way towards it from first principles over a long time;⁸ or have benefited from initiatives by experienced and energetic information professionals and key information users, supported by 'management champions'.⁹ They have not only developed information policies and strategies but have succeeded in bringing them into beneficial operation over time. Some continue to be used successfully in meeting external challenges and initiating innovatory change from within; some have fallen victims to hazards described later.

Why some find it difficult

While organizations realize that information is an important resource, as Oppenheim [16] says, they do not find it easy to handle.

A major stumbling block is understanding that each individual organization has to define for itself what constitutes information for it, in the light of what it is in business for. It is rare to find one that has done so. There is little awareness of the full range 'that emerges once one starts unpacking the meaning of mission statements or corporate objectives' [50, p. 31], or that information as a resource benefits the organization only when it forms part of human knowledge and is applied effectively in action.

Issues in organizational information policies

Organizations, like national governments, encounter issues and tensions in trying to develop information policy, and, like them, respond in different ways.

Human beings or technology first?

A major point of division is how they envisage the interaction between human beings and technologies for using information, and which they think of first when they consider information policy. The reasons, like those of governments, go back to the people who make the decisions (the amount of power they exert in the organization; their professional background; and their understanding of the technology, of the term 'information' and of how people in the organization need to use it), and to the relations between them and the people who sell them ICT solutions.

Early examples of the alternatives can be seen in Karni [62], who writes from the point of view of the IT professional, and defines information policy solely in terms of IT and systems; and in Weitzel [63], who insists that it must extend its range from IT management to the management of information content and use.

Blackler [64] takes an approach related to the thinking about ICT and information management of such researchers as Ken Eason [65] at HUSAT and Enid Mumford [66] at Manchester Business School. He contrasts two planning styles: task/technology centred, and organization and end-user centred. The priority in recent years, he says, has been to 'make the technologies work'; few forums exist in the UK for multi-disciplinary debate on IT issues and 'ergonomists and cognitive scientists [have predominated] in those that have existed'; and too much emphasis has been placed on rational thinking.

Monk [67] claims a dominant role for IT as 'the very means by which markets and other economic mechanisms operate'; its role is not just to profit its corporate owners; its primary significance is in the 'operation of the economy as a whole'. He concludes that 'the IT industries have in effect got their hand on the tiller of the economy but appear not to realize it yet, or perhaps they do and that is why they are keeping quiet about it', and one may reasonably suspect that the last phrase represents his opinion on the matter.

There are reports too in the early 1990s of disingenuous behaviour within companies in decisions about buying new IT systems. Gauthier and Sifonis [68] write of the need to 'dispel [...] truisms that became gospel in many countries' that IT solves business problems. The high cost of IT staff and equipment is accompanied by nebulous benefits, and non-IT staff dissociate from it. Technologists are not 'innocent victims' – 'the position of CIO [Chief Information Officer] was created by technologists for technologists' to give them a management status consistent with the rising role of IT.

Farbey et al. [69] describe an investigation, commissioned by a vendor, of how clients decided to acquire new systems. Case studies showed less than half claimed to have an IT strategy, decisions were made piecemeal, and uses proposed were all far from current thinking on the subject – they did not, for example, include reconfiguring how work was done, connecting to customers, or supporting co-operative work. The benefits mentioned were all short-term and quantitative. Powell [70] observes that 'often, mere lip service is paid to the strategic nature of IT'; strategic justification has become a tool for securing investment in IT by circumventing established organizational policy on investments. Labelling what you want as strategic ensures that you will get it!

The dominance of IT-centred policies was challenged in practice in the 1990s. Two examples come from the museum world; Nunn [71] describes how the Natural History Museum moved towards a corporate information strategy, from an initial focus on the technology to realizing that full value from it was attainable only if systems meet the needs of users and are integrated organization-wide. At the Tate, a similar process took place, which I was fortunate enough to be able to observe over several years. Beard et al. [72] describe a progression from IS strategy to information policy. The digital strategy which the gallery is developing has been 'framed within a developing information policy which sets out why the organization's information resources [...] need to be treated with as much care as the works themselves.' This was a long-term evolution/revolution driven by an alliance of strategists,

systems and LIS professionals and top management (documented in Orna [51, 73]).

Top-down or middle-up-down?

Another long-running issue concerns whether the initiative for information policy should proceed top-down, or middle-up-down as advocated by Nonaka and Takeuchi [53]. The best-known UK attempt to encourage top-down action is probably the IMPACT Programme, which began in 1995, when the Hawley Committee, a group of Chief Executives with an interest in maximizing the return from corporate information, produced a 10-point *Board Agenda* [74] addressed to directors. Ward and Ward [75] describe it as a simple check-list and supporting guidance, couched in language which they tactfully call 'appropriate at Board level', and as a successful attempt to engage senior management in information governance issues and reach beyond the pre-occupation with technology and IT investment – but without explicitly addressing either knowledge issues or exploitation of information or knowledge in any detail. It is not clear whether the success has been long-lasting. The *Agenda* gave no direct indication of 'where shortcomings may exist or how gaps might be plugged'. It was followed by the *Information Health Index* (KPMG IMPACT Programme Ltd [76]), which was designed to give a quick picture of information governance in companies, with 'potential to guide information strategy and policy'.

The idea of 'middle-up-down' management as an essential enabler of knowledge creation, along with a strategy for knowledge and information, is described by Nonaka and Takeuchi [53]. It refers to the autonomy given by top management to groups entrusted with responsibility for new developments, which allows original ideas to develop and spread through 'a spiral conversion process involving both the top and the front-line employees', a process which 'puts middle managers at the very center of knowledge management' [53, p. 127]. Examples of the process in operation are presented in their book; others are described in Orna [51] and [73]. (In the first of these references, there is also an extensive discussion of the relation between knowledge management and information management and of the significance of both for information strategy.)

Information culture

A third major issue in organizational information policy is the influence of the organization's 'culture', especially in respect of information. The key questions are whether it is recognized or unacknowledged; and whether or not the policy takes account of it and aims to change it. Ginman [77] reports on research in Finland on the relationship between information culture and business performance, which indicates links between the CEO's information culture, company culture, its 'life cycle' stage, and business performance.

Davenport et al. [78] introduced the idea of organization politics in relation to power structures into the discussion of the subject. They identify five political models, from feudalism to technocratic utopianism, and conclude that the wrong political structure can sink efforts to create information-based organizations. Their advice is: recognize the politics of information and their effect on organizational culture, and aim where necessary to change them, to achieve a more information-friendly political system. These ideas are followed up in Davenport and Prusak [54] and [55].

Literature reviews of organizational and information culture and business performance by Abell and Winterman [79] suggest that an adaptive 'empowering' culture is seen as necessary for good long-term performance, and that human knowledge and interpretation of data confer a competitive edge.

A Reuters study, in 1994, of information sources and their use in business [80] recognizes, however, that:

today the giving and withholding of information is inextricably linked with organizational politics and, as a result, the knowledge-based organization where free-flow of information contributes to the general good is still largely a fantasy.

The authors ask what will happen to organizations that are unable, because of information politics, to capitalize on coming innovations in multimedia information diffusion to homes and businesses. Today, when the promised innovations and more have arrived, it is doubtful whether organizations have become any better at managing the politics of information. Kristiansson [81] observes that information politics still affect the way organizations are structured and vice versa; he considers that since an organic type of structure has proved most suitable for handling the complexity and unpredictability that still surround organizations, they should seek to develop their information politics to support that

form and counteract hierarchical and 'mechanic' structures, a counsel that like much good advice, is easier to give than to follow.

Valuing information

The ability to assign a reliable, and preferably monetary, value to information would be a winner in gaining and keeping the attention of senior management; most organizations, however, have been reluctant to approach it, because they could not see how to do it. The difficulty arises partly from mistrust of qualitative measures and partly from the intellectual demands of methods for converting qualitative to quantitative. It is compounded by imperfect understanding of the unique qualities of information, which affect its value crucially: as Taylor [82] points out, the value of information 'cannot be measured in precise terms prior to its use [...] it is given value by its user'; when information is exchanged and traded, its value in use can increase for all parties; its value is not reduced by use, it can be used many times to add value to many activities by many users; as an 'asset' or 'intellectual capital' it has value only when it is being put to productive use (see Orna [51, 83]).

Support for qualitative measures of information value comes from research by Oppenheim et al. [84] and Marchand et al. [56]. Oppenheim and his colleagues, on the basis of research with a sample of UK organizations, concluded that 'arriving at a value of information or knowledge is not an objective exercise' because its value is 'by its very nature [...] subjective, dependent on the interpretation [of those] who employ information in particular situations for particular purposes.' Marchand and his colleagues, working with a large international sample of senior managers, make a strong case for qualitative, and statistically reliable, measures of the value of information in relation to business performance. The metric they developed for their research depends on the relation between senior managers' judgment of their own company's business performance, and the extent to which the company combines effective management of information and IT with appropriate information and knowledge behaviour (its 'information orientation').

M'Pherson [85], who is unusual in approaching the subject from a background of systems engineering, has over a number of years tackled the problem of measuring intangible value, in order to ensure that 'the intangibles of a company are valued rigorously, to the extent that Intellectual Capital value becomes an accounting number.' His 'Inclusive Value Accounting

Framework', developed through action-research applications in a number of companies, achieves this on the basis of knowledgeable judgments by responsible managers. He acknowledges that the intellectual effort they need to make in coming to terms with the concepts involved is a major barrier; it can probably be overcome only in large corporations.

Ryan [86] describes a less exact and exacting method (in use at the European Bank of Reconstruction and Development) for determining the value of the information provided by an information unit; it depends on 'time-saved tariffs' agreed between the unit and its users – i.e. the time that the unit's services saved the users, converted to an agreed pounds-per-hour figure.

That concludes this necessarily brief account of organizational information policies. It now remains to draw the strands of this article together, in a brief picture of what our discipline and profession have contributed in the field of information policy up to the present; and to look ahead to the future – not with anything so portentous as a prediction, only a suggestion, in the light of yesterday and today, of tasks for tomorrow.

The picture today

Looking back over the years since the IIS was founded, on the basis of direct observation from inside the information world for many of them, gives something of the sense of seeing the same bits of luggage coming round time and again on the carousel. There has been some progress over time, but the same tensions and misunderstandings repeat themselves, which suggests that not much learning goes on.

In the UK, leaving national information policy to the market has not paid off as well as expected. The ICT industry has dominated, its power not balanced by sufficient knowledge on the government side to control it. Government talk of the empowerment of users and of 'transparency' has therefore been perceived as empty, naive, or disingenuous. In practice, IT-led national information policies have shown up dangerous weak points in human/ICT relations (mostly recently in the stories of disappearing disks of sensitive data, caused by human errors and failures to appreciate security risks [87–89]), and technical failures of promised large and complex systems for integrating data, most notably for the National Health Service [90] and national ID cards [91].

The interface between policy directives and formulation and implementation has not been a happy scene either. Frequent policy initiatives

have rolled out after too little thinking and too little study of past history, and too little time has been devoted to supporting those who have to carry them out.

To set against that, however, is the recent apparent change in government thinking in its response [32] to *The Power of Information* [31]; though, given the number of more pressing concerns the government faces at present, it seems unlikely to be expressed in action any time soon.

So far as organizational information policies are concerned, there is comparatively little to show in the way of actual working information policies and strategies that have survived for a long time. It seems, in the recent words of a colleague in search of examples of information policies in organizations, that 'once they have ticked the FoIA and DPA boxes, and have a website and a CMS in place (whatever they may or may not be doing with them) that's it'. TOTO (the top of the organization) for the most part still has undue faith in technology, and weak understanding of what information means and of what LIS professionals know. On the other hand, however, there are more examples of mutual understanding and co-operation between information managers and IT/systems; and of information management and knowledge management working together on an equal footing.

Like any other policy, information policies are vulnerable to change. Following up the fate of soundly established policies that were working well, in organizations where I had either made case studies or undertaken consultancy assignments, suggests the main threats to survival are: change in power structures at the top, especially loss of the original sponsor; and external pressures, in the form of financial imperatives, the general economic climate or specific market conditions; and legislative changes requiring compliance – all compounded by the corporate amnesia so prevalent at board and senior management level.

The contribution of information science to information policies

Over the years covered by this brief history, the discipline of information science, and its practitioners, have contributed a body of information policy research both theoretical and practical, much of it based on study of how organizations think and behave. Their research has built up a strong case for information policies, and has provided evidence of how to achieve and use them, on both a national and organizational scale.

They have recognized, from the earliest days, the potential and risks of what is now called the digital revolution; and the thinking of those whom the brief for this issue calls 'founding players' and their successors has played a leading part in efforts to narrow the gap between ICT and information content, between 'socio-' and technical approaches.

There are today many well-established LIS professionals at work, whose education and training have been influenced by the information science discipline. They have deep knowledge of their organizations and shrewd ability to make use of their power structures. Good opportunists, they use their knowledge to exert middle-up-down leadership and educate TOTO, and they work as initiators, bridge builders and 'translators' between groups who use different language to talk about similar things.

And in spite of the difficulty that decision-makers, in government and in organizations, have in grasping their message and retaining it, researchers and practitioners have persevered.

And tomorrow?

Will information policies/strategies still be needed, and is it worth going on trying?

The short answer is yes, above all to try to sort out the consequences of power imbalance, which become graver and more dangerous as the dependence of information transactions on the ICT industry increases.

It will be clear from what has gone before that I hold no undue hopes, because understanding at the top is so often both narrow and shallow, and because of the hazards to which that exposes information policies. But that is not to say that it is time to abandon future efforts. Here are my suggestions for what they should be addressed to.

National

- Controlling the power of the information industries; making national information policy in the UK less market-driven and more dirigiste, to use Moore's word [19].
- Encouraging the British Government to follow up the lead it gave in commissioning in 2007 *The Power of Information* [31] (see above) and in responding to it.

- Imposing a 'due diligence' requirement throughout government that before introducing any initiative/policy/legislation, the history of previous attempts in the same line must be investigated and taken into account.¹⁰

Organizational

- Helping organizations to: get value from social computing without endangering the integrity of their information resources; being aware of how easily it can be subverted; remembering that the 'wisdom of crowds' depends on who is in the crowd, and the 'collective intelligence of employees' on how minded they are to put it at the disposal of their employers and colleagues.
- Educating all users, from TOTO down, in information management that goes beyond using IT tools and systems, and relates information to what they need to do with it.

Both national and organizational

- Getting the best rather than the worst from Web 2.0 developments nationally and in organizations.
- Paying more attention to the socio- aspect of socio-technical systems; seeking forms of human/technology co-operation that take a realistic view of human nature. In particular, on the technical side, search development to match the capability of the technology (see e.g. Dutra [92]) and on the socio- side, more attention to the psychology and sociology of organizations in order to make it worth people's while to use the technology to contribute and exchange their knowledge.
- Securing preservation of digital content, nationally (through the recently launched plan for a government-wide service managed by the National Archives [93]) and in organizations.
- Bringing information products¹¹ within the scope of information policy/strategy. As the definition in the note makes clear, this term covers the whole range from traditional print on paper to all kinds of web-based products, and the information policies of all organizations, including government departments should take an integrated view of whatever in that line they offer to their own staff and the outside world. Without information products, 'information content' could not

exist in any accessible form, and they are the main embodiment of the knowledge that would otherwise remain locked in individual minds. To get full value from them, they need – but seldom get – the combined skills and knowledge of many professions, in particular LIS, ITC and information design, and the collaboration of those who will need to use them in their work. (The full arguments are developed in Orna [73, 94].)

- Respecting all users, including those who are not able to use electronically presented information.
- Making thinking time respectable.

In conclusion

History should teach us to accept that progress will continue to resemble those medieval circle dances which advance so many steps, go back the same number, then forward again, making slow progress onwards because the forward steps are slightly longer than the backward. It will give us a more realistic view than believing that technology and the market will take us forward with giant strides. It is better to join the dance and use knowledge from our history to make the forward steps longer.

Acknowledgements

I am grateful to the referees and to Alan Gilchrist for their helpful comments.

Notes

- 1 Recently discovered sound recordings and research on the history of propaganda reveal some disreputable origins of British propaganda, from privately produced recordings of patriotic (and fanciful) ‘docu-dramas’ of life at the front to highly organized official concealment and falsification of news for home and overseas consumption, to manufacture and planting of atrocity stories. By the end of the First World War, government propaganda seems to have embodied most of the activities that the Ministry of Information and later the Central Office of Information became responsible for at a more respectable level (programme: *The Sound of Flanders*, *The Archive Hour*, presented by Frank Gardner, BBC R4, 24 November 2007).
- 2 The long history of how UK governments have dealt with this is set out in the National Archives website [12]; prefaced with the melancholy statement that

'Statistical Departments does not have a parent', a piece of archive-speak which characterizes in other senses the collection of statistics in the UK. Not until the Second World War, at the insistence of Churchill, was a Central Statistical Office established (1941). Growth continued postwar under Claus Moser, but its functions and resources were reduced after Sir Derek Rayner's review in 1980. Erosion continued until 1991 when the direction changed, with a series of reforms culminating in the Office of Population Censuses and Surveys and CSO merging to form today's Office of National Statistics.

- 3 It is interesting that the modern scope of national information policy pays comparatively little attention to the aspects under which the concept first appeared – dissemination, presentation, communication and the audience to which they are addressed.
- 4 Rowlands [2] describes politicians as using the information society portmanteau of modernizing the telecoms infrastructure, promoting competitiveness, re-skilling the workforce, social cohesion, extending democracy, and open/accountable government, to 'create a warm feeling in audiences'.
- 5 George et al. [28] describe the information society as a 'fuzzy social concept' which leaders of many countries think a desirable state 'whatever it is'. Their analysis suggests that the information society 'seems to be used as a rallying concept for the mobilization of bias within a country [...] a rallying image of an electronic utopia that may have little to do with what actually evolves'.
- 6 Itami [52] describes people as the embodiment of 'invisible assets' who 'carry and exchange the information necessary for strategic fit'. Davenport and Prusak [55] assert that knowledge creation 'remains largely an act of individuals or groups and their brains', and Nonaka and Takeuchi [53, p. 74] give first place to a strategy for knowledge and information in their list of conditions for the creation of knowledge in companies.
- 7 For example the British Library, the subject of two case studies covering the period from 1989 to 1998–9, the year after it was handed over (Orna [50, 57]).
- 8 Examples are the Tate, the Victoria and Albert Museum, and Surrey Police; see case studies in Orna [50].
- 9 For a number of case studies from the UK and other countries, see Orna [50].
- 10 It might enable them to follow Gerry Robinson's succinct advice (BBC2, 12 December 2007) in connection with NHS policies: 'Don't keep introducing ruddy policies – manage it!'
- 11 'The products, print on paper or electronic, through which information is presented for use. They embody the results of the transformation of knowledge into information [...] and are an integral blend of content and container' [73].

References

- [1] N. Moore and J. Steel, *Information-Intensive Britain. British Library R & D Report No. 6038* (The Policy Studies Institute/British Library Board, London, 1991).
- [2] I. Rowlands, Some compass bearings for information policy orienteering, *Aslib Proceedings* 50(8) (1998) 230–37.
- [3] National Archives. Available at: www.nationalarchives.gov.uk (accessed 9 January 2008).
- [4] T.F. Clark, Do we need government information services? *Public Administration* 35(4) (1957) 335–46.
- [5] Central Office of Information. Available at: www.coi.gov.uk (accessed 10 January 2008).
- [6] US National Archives and Records Administration. Available at: www.archives.gov/research/ (accessed 10 January 2008).
- [7] F.E. Rourke, Administrative secrecy: a Congressional dilemma, *The American Political Science Review* 54 (1960) 684–94.
- [8] E.S. Dunn Jr, The idea of a National Data Center and the issue of personal privacy, *The American Statistician* 21(1) (1967) 21–7.
- [9] D. Muddiman, Red information scientist: the information career of J.D. Bernal, *Journal of Documentation* 59(4) (2003) 387–409.
- [10] J.D. Bernal, *The Social Function of Science*. (Routledge, London, 1939).
- [11] B. Vickery, *J.D. Bernal: science and social development* (2006). Available at: www.lucis.me.uk/bernal.htm/ (accessed 28 February 2008).
- [12] National Archives, *The National Digital Archive of Datasets* (2007). Available at: www.ndad.nationalarchives.gov.uk/AH/5/detail.html (accessed 10 January 2008).
- [13] I. Rowlands, Understanding information policy: concepts, frameworks and research tools, *Journal of Information Science* 22(1) (1996) 13–25.
- [14] E. Maceviciute and T.D. Wilson, The development of the information management research area, *Information Research* 7(3) (2002). Available at: <http://informationr.net/ir/7-3/paper133.html> (accessed 5 April 2008).
- [15] Domestic Council Committee on the Right of Privacy, *Rockefeller Report, National Information Policy* (National Commission on Libraries and Information Science, Washington, DC, 1976).
- [16] C. Oppenheim, Are national information plans useful? *Alexandria* 6(2) (1994) 133–43.
- [17] M.W. Hill, *National Information Policies and Strategies. An Overview and Bibliographic Survey*. British Library Research: Information Policy Issues (Bowker Saur, London, 1994).

- [18] N. Moore, The information policy agenda in East Asia, *Journal of Information Science* 23(2) (1997) 139–47.
- [19] N. Moore, Policies for an information society, *Aslib Proceedings* 50(1) (1998) 20–24.
- [20] N. Moore, The British national information strategy, *Journal of Information Science* 24(5) (1998) 337–44.
- [21] A. Muir and C. Oppenheim, National Information Policy: developments worldwide. I: Electronic government, *Journal of Information Science* 28(3) (2002) 173–86.
- [22] A. Muir and C. Oppenheim, National Information Policy: developments worldwide. II: Universal access – addressing the digital divide, *Journal of Information Science* 28(4) (2002) 263–73.
- [23] A. Muir and C. Oppenheim, National Information Policy: developments worldwide. IV: Copyright, freedom of information and data protection, *Journal of Information Science* 28(6) (2002) 467–81.
- [24] C. Oppenheim, An agenda for action to achieve the information society in the UK, *Journal of Information Science* 22(6) (1996) 407–42.
- [25] M. Brown, The field of information policy. 1: Fundamental concepts, *Journal of Information Science* 23(4) (1997) 261–75.
- [26] M. Brown, The field of information policy. 2: Redefining the boundaries and methodologies, *Journal of Information Science* 23(5) (1997) 339–51.
- [27] D. Horner and P. Day, Labour and the information society: trade union policies for teleworking, *Journal of Information Science* 21(5) (1995) 333–41.
- [28] J.F. George et al., The information society: image versus reality in national computer plans. *Information Infrastructure and Policy* 4, (1995) 181–92.
- [29] R. Marcella and G. Baxter, The impact of social class and status on citizenship information need: the results of two national surveys in the UK, *Journal of Information Science* 26(4) (2000) 239–54.
- [30] W. Davies, *Modernising with Purpose: a Manifesto for a Digital Britain* (Institute for Public Policy Research, London, 2005).
- [31] E. Mayo and T. Steinberg, The power of information: an independent review. Available at: www.cabinetoffice.gov.uk/upload/assets/www.cabinetoffice.gov.uk/strategy/power_information.pdf (accessed 10 January 2008).
- [32] *The Government's Response to The Power of Information: an Independent Review by Ed Mayo and Tom Steinberg* (2007) Presented to Parliament by the Chancellor of the Duchy of Lancaster, June 2007, Cmd 7157.

- [33] M. Koenig, Information policy – the mounting tension (value additive versus uniquely distributable public good), *Journal of Information Science* 21(3) (1995) 229–31.
- [34] N. Moore, Policy issues in the multimedia age, *Journal of Information Science* 22(3) (1996) 213–18.
- [35] M. de Saulles, Information literacy amongst UK SMEs: an information policy gap, *Aslib Proceedings* 59(1) (2007) 68–79.
- [36] Cabinet Office, *Transformational Government Enabled by Technology: Annual Report 2006*. Cmnd 6970 (2007).
- [37] National Audit Office, *Government on the Internet: Progress in Delivering Information Services Online* (2007). HC259 Session 2006–7. Available at: www.nao.org.uk/publications/nao_reports/06-07/0607529es.htm (accessed 10 January 2008).
- [38] HM Treasury, *Service Transformation Agreement* (2007). Available at: www.hm-treasury.gov.uk/media/B/9/pbr_csr07_service.pdf (accessed 10 January 2008).
- [39] M. Cumming and L. Cuthbertson, Wired in Whitehall: a survey of internet and intranet use in government, *Aslib Proceedings* 53(1) (2001) 32–8.
- [40] J. Strachan and I. Rowlands, Information for policy making. In: I. Rowlands (ed.) *Understanding Information Policy: Proceedings of a British Library Workshop, July 1996* (Bowker-Saur, London, 1997).
- [41] L. MacLachlan, From architecture to construction: the electronic records management programme at the DTI. In: A. Gilchrist and B. Mahon (eds), *Information Architecture: Designing Information Environments for Purpose* (Facet, London, 2004).
- [42] Office of the Deputy Prime Minister, *The National Strategy for Local e-Government* (2002). Available at: <http://archive.cabinetoffice.gov.uk/e-envoy/> (accessed 10 January 2008).
- [43] Salford Council, *CRM National Project* (2004). Available at: www.salford.gov.uk/council/corporate/e-government/crmnp.htm (accessed 10 January 2008).
- [44] Salford Council, *CRM Academy* (2003–). Available at: www.crmacademy.org/ (accessed 10 January 2008).
- [45] D. Budzak, Developing an information management policy – is too much attention paid to the technology? *Information Management and Technology* 39(2) (2006) 89–93.
- [46] Department of Communities and Local Government, *Local e-Government Programme*. Available at:

- www.communities.gov.uk/localgovernment/efficiencybetter/localegovernment/ (accessed 10 January 2008).
- [47] Brent Council, *IT Strategy 2007* (2007). Available at: www.brent.gov.uk/ (accessed 10 January 2008).
- [48] I. Rowlands (ed.), *Understanding Information Policy: Proceedings of a British Library Workshop, July 1996* (Bowker-Saur, London, 1997).
- [49] E. Orna and G. Hall, Developing an information policy, *Aslib Proceedings* 33(1) (1981) 15–20.
- [50] E. Orna, *Practical Information Policies*, 2nd Edition (Gower, Aldershot, 1999).
- [51] E. Orna, *Information Strategy in Practice* (Gower, Aldershot, 2004).
- [52] H. Itami, with T.W. Roehl, *Mobilizing Invisible Assets* (Harvard University Press, Boston, MA, 1987).
- [53] I. Nonaka and H. Takeuchi, *The Knowledge-Creating Company* (Oxford University Press, New York/Oxford, 1995).
- [54] T.H. Davenport and L. Prusak, *Information Ecology* (Oxford University Press, New York/Oxford, 1997).
- [55] T.H. Davenport and L. Prusak, *Working Knowledge* (Harvard Business School Press, Boston, MA, 1998).
- [56] D.A. Marchand, W.J. Kettinger and J.D. Rollins, *Information Orientation* (Oxford University Press, Oxford, 2002).
- [57] E.Orna, *Practical Information Policies*, 1st Edition (Gower, Aldershot, 1990).
- [58] M. van Mesdag, Information: the resource, *Managing Information* (London) August [1(2) (1981)] 3–38.
- [59] D. Neyland and C. Surridge, Information strategy stories: ideas for evolving a dynamic strategic process, *Perspectives, Policy and Practice in Higher Education*, 7(1) (2003) 9–13.
- [60] J. Baxter, *Management Summary of LA Survey for the Information for Business Campaign* (Information Research Network/Library Association, London, 1996).
- [61] *Over 44% of Companies without Information Management Strategy* (2005.) Available at: <http://managinginformation.com/newsletters/previous/issue187.htm> 9 September 2005 (accessed 10 January 2008).
- [62] R. Karni, A methodological framework for formulating information policy, *Information and Management* 6 (1983) 269–80.
- [63] J.R. Weitzel, Strategic information management: targeting information for organizational performance, *Information Management Review* 3(1) (1987) 9–19.
- [64] F. Blackler, Information systems design and planned organization change: applying Unger's theory of social reconstruction, *Behaviour and Information Technology* 11(3) (1992) 175–83.

- [65] K. Eason, *Information Technology and Organisational Change* (Taylor and Francis, London, 1988).
- [66] E. Mumford, From bank teller to office worker: the pursuit of systems designed for people in practice and research, *International Journal of Information Management* 6 (1986) 59–73.
- [67] P. Monk, The economic significance of infrastructural IT systems, *Journal of Information Technology* 8 (1993) 14–21.
- [68] M.R. Gauthier and J.G. Sifonis, Managing information technology investments in the 1990s, *Bulletin of the American Society for Information Science*, June/July (1990) 16–19.
- [69] B. Farbey et al., Evaluating business information systems: reflections on an empirical study, *Information Systems Journal* 5, (1995) 235–52.
- [70] P. Powell, Causality in the alignment of IT and business strategy, *Journal of Strategic Information Systems* 2(4) (1993) 320–34.
- [71] L. Nunn, A corporate information strategy for the Natural History Museum, *MDA Information* 1(2) (1994) 2–3.
- [72] A. Beard et al., Towards a broader strategy. In: *MDA Annual Report 1999/2000* (Museum Documentation Association, Cambridge, 2001) 12–15.
- [73] E. Orna, *Making Knowledge Visible* (Gower, Aldershot, 2005).
- [74] Hawley Committee, KPMG IMPACT Programme Ltd, *Information as an Asset: the Board Agenda* (KPMG, London, 1995).
- [75] S.D. Ward and B.K. Ward, Information and knowledge management: business opportunity or corporate risk. In: *Proceedings of the 2005 Online Information Conference* (Learned Information, Oxford, 2005). 83–9.
- [76] KPMG IMPACT Programme Ltd, *Information as an Asset: the Information Health Index* (KPMG, London, 1995).
- [77] M. Ginman, Information culture and business performance, *IATUL Quarterly* 2(2) (1987) 93–106.
- [78] T.H. Davenport et al., Information politics, *Sloan Management Review* Fall (1992) 53–65.
- [79] A. Abell and V. Winterman, *Information Use and Business Success: a Review of Recent Research on Effective Information Delivery*, Information Policy Briefings No. 4 (British Library, London, 1993).
- [80] Reuters, *To Know or Not to Know: the Politics of Information* (Reuters Business information, London, 1994).
- [81] M.R. Kristiansson, Re-thinking strategic planning, Nord I&D, *Knowledge and Change* 181–94. Available at: www2.db.dk/NIOD/kristiansson.pdf (accessed 2 April 2008).

- [82] R.S. Taylor, *Value-Added Processes in Information Services* (Ablex, Norwood, NJ, 1986).
- [83] E. Orna, Valuing information: problems and opportunities. In: D. Best (ed.), *The Fourth Resource: Information and its Management* (Aslib/Gower, Aldershot, 1996).
- [84] C. Oppenheim, J. Stenson and R.M.S. Wilson, A new approach to valuing information assets. In: *Proceedings of the 26th Online Information Conference* (Learned Information, Oxford, 2002).
- [85] P.K. M'Pherson, *Rigorous measurement of IC value: what it means and what the benefits and costs might be*. Paper presented at the 5th International Conference on Theory and Practice in Performance Measurement and Management, London (2006).
- [86] F. Ryan, Surviving and thriving in a harsh world, *Library and Information Update* 4(5) (2005) 26–9.
- [87] H. Osborne, HMRC: a catalogue of data losses, *Guardian* 17 December 2007.
- [88] L. Smith, Security in tatters as more data goes AWOL, *Information World Review* January (2008) 1.
- [89] L. Smith, Data bombshell engulfs MoD, *Information World Review* February (2008) 1.
- [90] J. Carvel, Family doctors to shun national database of patients' records, *Guardian* 20 November 2007.
- [91] J. Ashley, The national ID register will leak like a battered bucket, *Guardian* 21 January 2008.
- [92] J. Dutra, Enterprise search: rethinking it in a Web 2.0 world, *FreePint* 29 November 2007. Available at: www.freepint.com/issues/291107.htm 2005 (accessed 10 January 2008).
- [93] *Government Commits to Finding a Solution to Preserving Its Digital Information* (14 June 2007). Available at: www.nationalarchives.gov.uk/news/stories/161.htm (accessed 10 January 2008).
- [94] E. Orna, Collaboration between LIS and information design disciplines: on what? why? potential benefits? *Information Research* 12(4) (2007). *CoLIS 6 Conference Proceedings Supplement*. Available at: <http://informationr.net/ir/12-4/colis/colis02.html> (accessed 5 April 2008).