

Accountability in Cross-Tier e-Government Integration

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Abstract

One of the most challenging aspects of the future of e-government is the practical implementation of 'seamless' government across jurisdictions. In Australia's federation, this means integrating systems and processes across some combination of the Australian Government, State and Territory Governments, and Local Governments and Authorities. This paper sketches the likely practical implementation of such integrations and then focuses its attention on the issues of accountability for the organisational arrangements described. As well as identifying the limitations present in current legal and regulatory circumstances, the paper proposes one possible approach that uses information technology to facilitate practical scrutiny of a complex multi-jurisdictional operation.

Introduction

This paper paints a picture of a future where electronic government (e-government) services are integrated across tiers of government in Australia. It does not focus on the necessary technology issues that must be addressed, nor does it consider the process re-engineering and the standards agreements that will be required to make integrated services a functional reality. Rather, it looks at the underlying organisation needed to balance the requirement of focused operations delivering an efficient service, and the variety of interests that must coalesce to provide the environment in which integrated services are operated. The paper firstly sets the scene by defining e-government and integrated services as a basis for the remainder of the discussion. Attention then turns to describing the type of organisation that will be needed to house the operations of any non-trivial cross-jurisdictional integrated service. It adopts a vision of such an organisation at its most complex, involving many government agency partners as well as the private sector. After briefly recounting the nature and characteristics of such an organisation, the paper narrows its focus to the accountability issues that the organisation would raise. Critical issues around jurisdictional boundaries and the limits of auditor insight into complex services operated by many partners are explored. Finally, the paper introduces a potential accountability facilitator derived from the same technologies that permit the integration of services. The proposed facilitator is complete with a security architecture that would aid in maintaining the integrity of jurisdictional boundaries without compromising the thoroughness of accountability review.

An Introduction to Integrated e-Government

E-government is a well-established part of government activity (National Office of the Information Economy, 2002). Virtually all developed countries and an increasing range of developing countries are providing government information and services

enabled or supported by Internet and information technologies (Accenture, 2003, Organisation for Economic Co-operation and Development, 2003). A substantial proportion of these international e-government offerings are really only alternate information channels, but early pioneers have already established the viability of providing more complicated services over the Internet (Accenture, 2003, Organisation for Economic Co-operation and Development, 2003). In Australia, the federal government established an agenda to have “all appropriate services online by 2001” (Department of Industry Science and Technology, 1997). In February 2002, Prime Minister John Howard announced the attainment of that goal with over 1600 services available (Alston, 2002). The then Minister for Communication, Information Technology and the Arts, Senator Richard Alston, stated that this was only the beginning and that the government would focus on increasing the interactivity of the services available and the integration of offerings between agencies and across government tiers (Alston, 2002). This direction has been imbedded within *Better Services, Better Government* (National Office of the Information Economy, 2002), where one of the six key objectives is to “integrate related services” leading to “the quality and efficiency of government services and information [improving] to create broader and faster access to integrated, flexible and more customised services” (National Office of the Information Economy, 2002, p1).

Australia is and has consistently been one of the leaders in implementing e-government (Accenture, 2003, National Office of the Information Economy, 2002). It is appropriate and inevitable that the Australian Government would turn its attention to the more challenging task of integrating services across agencies and across jurisdictions. This goal is one of the archetypal catch cries of e-government: “From the user’s perspective, e-government should enable citizens and business to deal with government on a vast range of matters, any time of the day or night, without having to understand which part of government is providing the service they require” (National Office of the Information Economy, 2002, p5).

So, what does ‘integrated services that hide the machinery of government’ actually mean? In considering the actual services, there are four variations that are lumped together into ‘integrated services’ discussions:

- All relevant agencies offering the same service in a common manner, sharing data definitions and at best sharing data, but no technological integration between the services being offered (eg, Tasmania’s CouncilConnect <http://www.councilconnect.tas.gov.au/councilc/home.do>)
- Services are collected together under a common theme or event. The services are not inherently integrated, or even with a common look-and-feel, but are grouped in ways that aid discovery and promote comprehensive completion of necessary services (eg, Australia.Gov <http://www.australia.gov.au/>, HomeInSite <http://www.homeinsite.tas.gov.au/>, FishOnline <http://www.fishonline.tas.gov.au/>, etc)
- Services are delivered by a single provider as an agent of other government agencies. Singular services are offered by the agent and the integration is hidden from the ‘customer’ (eg, Centrelink, ServiceTasmania, ServiceSA)
- Services are technologically integrated into a pseudo-supply-chain application. This requires the most sophisticated integration work and is not often

implemented (eg, online ABN registration process
<http://www.abr.business.gov.au/>)

Regardless of the extent of claimed or proposed integration, there are inhibitors to 'perfect' integration (ie, a single, coherent instance of a service offered regardless of the legislative or jurisdictional distinctions underlying the different elements of the service). The dominant inhibitors are the need to maintain a multi-channel offering for the vast majority of government services (National Office of the Information Economy, 2002) and the political requirements for autonomy and sovereignty, particularly when crossing jurisdictions (Balmer, 1981, Painter, 1998b). That is, each agency at each level of government will be motivated to maintain its own offering of its element of some over-arching integrated service to accommodate those customers that do not require the whole integrated service, to accommodate unique exceptions, and to maintain a means of demonstrating the delivery of undertakings made by the relevant political bosses (typically, but not exclusively, Ministers) (Barrett, 2002b).

Consequently, integrated services will tend towards the aggregation of existing self-contained services (or parts thereof) either through the simple collection techniques illustrated in portals that are available today, or through more sophisticated constructions where some supra-government service automatically links together the relevant and necessary components of the integrated service through electronic integration with the components maintained and offered by the constituent agencies. There have been some early attempts as such services, with the earliest being the Business Entry Point and the Australian Business Number Registration process. Others have been trialled as part of the Trials of Innovative Government Electronic Regional Services (TIGERS) project.

Making Integrated e-Government Services Real

The approach of integrating services *ad hoc* from multiple service offerers is well-established in the rhetoric of technologies like Web Services and ebXML (Mertz, 2001, Wolter, 2001). There are very few examples of the technology working as suggested at present, but there is enormous attention in the area so examples will increase. This paper is not directly interested in the technological issues surrounding integration; the subject is being considered and written about widely.

If there is to be a supra-governmental service it will be operated by some organisation (Painter, 1998b). As the ideal circumstances of integrated services arch over all three levels of government in Australia, the organisation is likely to be framed in terms consistent with other inter-governmental relations approaches, for example, the Murray-Darling Basin Commission, the Australian Consumer and Competition Commission, or the Australian National Training Authority. Such organisations have been applied to a variety of cross-jurisdictional issues, with mixed effectiveness (Barrett, 2002b, Painter, 1998a, b, c).

But an organisation supporting the delivery of cross-jurisdictional integrated e-government services will almost certainly include the added complexity of involving at least one private sector partner (Barrett, 2002b, Painter, 1998a, Wettenhall, 2003) given the need for specialist technical skills and whole-of-nation coverage for support.

This is not guaranteed, but this paper considers it as it is a more complex problem than 'straightforward' intergovernmental relations (if there is such a thing!).

The arrangements that might be necessary are difficult to describe concisely. In an effort to capture the whole arrangement, Figure 1 is used to help guide the description that follows.

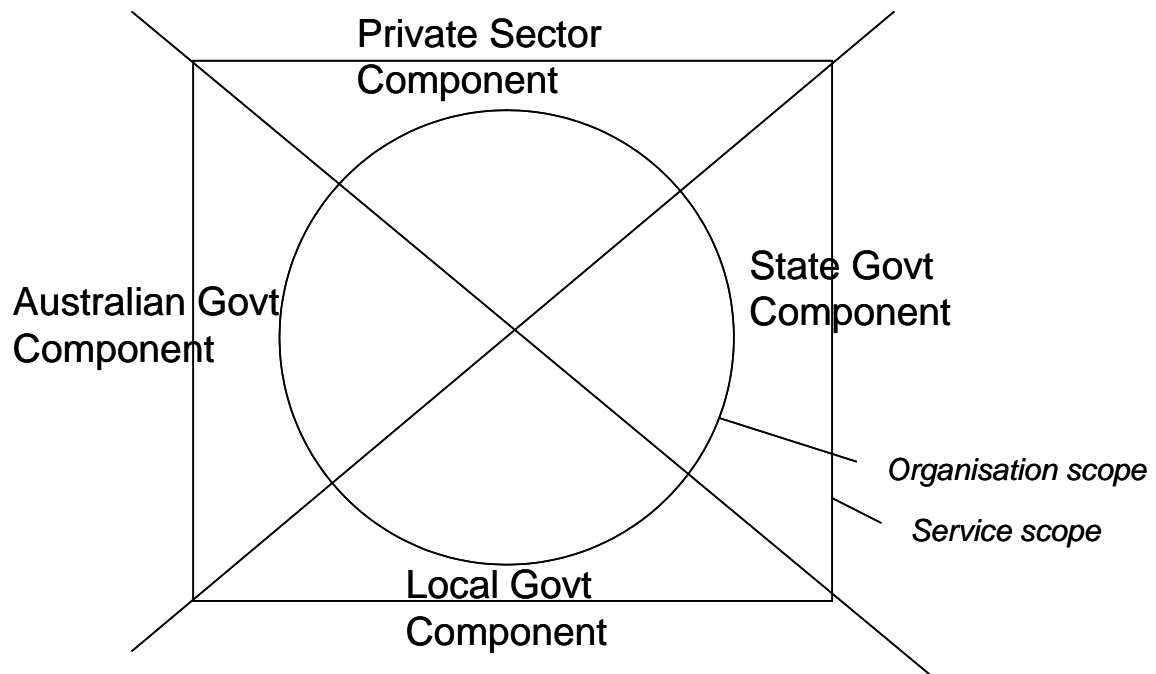


Figure 1: Sketch of Supra-Governmental Organisation Scope and Interests

The organisation (central circle in Figure 1) is composed of the interests of the main jurisdictions and provides the environment in which the integrated service is delivered. The service, however, is composed of more than just those operations that lie within the organisation; the service boundary is represented by the square in Figure 1. This incorporates the idea that each participant would offer some of or their entire component of the integrated service as a stand-alone offering under their own 'brand'. The relative proportion of each participant would change for each integrated service, and many would not include some private sector online service directly, but the general condition suggests that all participants are involved in the service, and that all those involved in the service are involved in the organisation that delivers the integrated whole (the scope of the segments in Figure 1).

One further complication that Figure 1 cannot represent without cluttering the diagram unacceptably is the fact that each participant is very likely to actually be some number of participants from each jurisdiction; that is, many Australian Government agencies; many (probably all) States, and likely many State-level agencies; many, if not all, Local Governments; and possibly several private sector players within a consortium involved in the organisation.

It would be difficult to overstate the complexity of this organisation, and it is likely that there would be several such organisations, probably a minimum of one in each sector (eg, health, taxation, welfare, industry development, etc), if only to assuage public concerns about centralised data holdings by the 'Big Brother' government(s).

The nature of this supposed organisation is fascinating because of that complexity. Obvious areas where wholly new approaches are likely to be needed are in: formal participation structures (some hybrid of intergovernmental arrangements and public companies), the governance structure (the membership of a board of directors would be hotly contested), accountability (the focus of the remainder of this paper) and how such an organisation would evolve over time in the face of changing technology, changing consumer demands, and regular changes of government (politicians and policies). It is little wonder that many information technology professionals are of the view that, in e-government ‘the technology is easy, the politics is where the real issues lie’ (Cole, 2001).

The paper now turns to the matter of accountability in this postulated future arrangement for the delivery of complex, integrated, electronic government services.

Accountability in Cross-Jurisdiction Administration

This paper adopts the following definition of accountability: “... the legal obligation to be responsive to the legitimate interests of those affected by decisions, programs, and interventions. To be responsive includes the duty of care and the requirement that information concerning expenditure of funds and the exercise of public authority should be given to the individuals affected, including legislators” (Considine, 2002, p22). This is important in both private and public organisations, but is generally more important in public organisations (Bozeman & Bretschneider, 1986). “The ability of the public sector external auditor to report in detail to the public domain of Parliament on the efficiency and effectiveness has no similar parallel in the private sector” (Barrett, 1996, p5). In the private sector, provided the decision-maker does not break the law, they may choose to do as they wish with no requirement to justify their decisions to others (Bozeman, 1979, Quiggin, 1999). The higher level of scrutiny in public organisations leads to higher levels of accountability mechanisms (Bozeman & Bretschneider, 1986) usually implemented as controls over process and procedures (the means) (Barrett, 2002a, Considine, 2002) because of the difficulty in identifying performance and output measures (the ends) to control (Bretschneider, 1990, Rainey, 1983).

There is a substantial overlap between the demands of accountability and those of governance (Barrett, 2003). Governance is attracting a great deal of attention at present because of high-profile failures in the private sector through poor or corrupt mismanagement (Barrett, 2001b), and the public sector is not immune to criticism in this area. This paper will, however, focus on the accountability issues embodied in the validation and verification of appropriate activity, and specifically some of the issues of auditing the postulated organisation.

The general public expects that the government is working in their (the public’s) best interests; a feeling of proprietorship and a fundamental belief that this is what government exists to do (Rainey, Backoff & Levine, 1976, Singh et al., 2001). In circumstances such as an integrated service provided across many tiers of government and involving private sector partners, the public will typically not be able to grasp the complexity of the accountability issues involved (Haque, 2001). But they will have a simple requirement: its operation must be fair, equitable, correct, timely, and not inadvertently disadvantage them. One suggestion is that “a reasonable test...might be

that [the accountability arrangements] are at least equivalent to the transparency and accountability ...if such arrangements were contained within one jurisdiction” (Crompton, 2004, p5). The public will want to be assured of this not by some complicated collection of audit reports but through a simple statement, preferably by an elected official who can be held electorally responsible that “everything is fine”. They will want to know that the large, detailed, audit reports exist, but not be particularly interested in the details themselves (Balmer, 1981).

What circumstances can we expect in the review of the appropriate behaviour of our postulated organisation that might lead to addressing the public’s expectations?

Both the federal and state levels of government have Auditors General whose role is specifically to provide an independent authoritative statement to the public, through the Parliament, of the appropriateness of operations of the government (Barrett, 2001b). State Auditors General have authority to audit the operations of local governments in their State (Barrett, 2002a). Most government agencies also maintain an internal audit team and many engage external auditors for additional scrutiny. However, all of these auditors are limited in the scope of their review by the legal environment in which they operate (Barrett, 2002a), and at base, the Australian Constitution (Balmer, 1981). In short, the federal Auditor General cannot review the operations of State government agencies, and no state Auditor General can review the operations of a federal government agency. And here lies the first issue with our proposed organisation. Recall Figure 1; the service scope extends beyond the organisational boundary into the operations of some federal, state and local governments. The federal Auditor General must limit his review to operations within the federal government sphere, and within the organisation itself. State Auditors General are similarly constrained. This can lead to two separate reviews developing two different, conflicting opinions on the success of the operation of the organisation (Barrett, 2002a). To some extent this is ameliorated if the audits are conducted simultaneously, however, if there are several states involved, this is a lot of simultaneous audit activity and may be unachievable (Barrett, 2002a).

The involvement of private sector players in the mix is less problematic in terms of access because of the contractual arrangements most likely to be adopted in such a circumstance (Barrett, 2002a, 2003). Essentially, private sector partners would be obliged to allow all relevant Auditors General to examine relevant records (Barrett, 2002a). However, serious issues might arise when commercially sensitive elements of the private sector players’ operations are included in the integrated service and are discussed in detail in audit reports (Barrett, 2003). For the government to gain benefits from including private sector players, it would be expecting to incorporate leading edge, highly competitive service components of its private sector partners. Such service components may represent the competitive advantage of the partner. Revelations in public audit documents about the processes, and particularly any weaknesses, would certainly represent potential damage to the private sector partners’ business.

Furthermore, the organisation itself would be likely to have an internal and/or an external auditor appointed to promote efficient and accountable operations. These auditors would have the ability to see into the operations across the whole range of the organisation (entirely within the circle of Figure 1). They may even be provided the

access to the relevant elements of the public sector and private sector partners' operations. But, even if perfect insight was gained by that, they could only report to the organisation's leadership and almost certainly not be able to compel parliamentary attention to problems that might lie within one or more government agencies at whatever level. However, it seems unlikely that an auditor of our postulated organisation would be granted the complete range of access needed, and indeed, there may be concerns about revealing all of the operations within the organisational boundaries.

How to Manage Accountability in Our New Organisation

So, what remedies might be available to address the risks that are identified within this new organisational space? Two possibilities are immediately apparent, and there are probably others.

Firstly, the powers of Auditors General are established, and constrained, with the body of legislation governing our country (Barrett, 2002b, 2003). Intergovernmental agreement to amending the relevant laws might allow Auditors General to cross jurisdictional boundaries in appropriately limited ways to allow complete investigations 'in the national (or public) interest'. Such changes are likely to be fraught with political problems, if indeed the legal problems are surmountable. Further discussion of this alternative is outside the capacity of the author but this is an area where more research might valuably point to useful models for future intergovernmental collaboration.

We are imagining this Byzantine organisation in the context of the application of information technology in the operations of government. Perhaps information technology offers a potential remedy (Barrett, 2001a, 2002a)? The problem seems to be to allow insight into operations in other jurisdictions that relate directly to the operations of the integrated whole without 'revealing' the broader internal workings of autonomous agencies. One possible technology solution exists through the creation of highly-secure, shared audit logs of relevant information technology systems operations. In essence, as well as any other operations in the information systems that are integrated to produce the overarching service, a requirement might be set that an encrypted record of all transactions of the type offered within the service are written to a secure audit database housed within the proposed organisation (Barrett, 2001a, 2002a). This would mean that all transactions conducted by all organisations involved in the integrated service that relate to the components of the integrated service (even those transactions that were not delivered as part of an integrated transaction) would be written to one location.

The use of encrypted transactions allows controlled access to data that includes transactions that are not related to the specific operations of the postulated organisation; that is, those transactions that were not part of an integrated transaction but used systems in partner agencies that are normally part of an integrated transaction. One technique that might be usefully applied has been proposed for secure electronic vote counting (Jorba, Ruiz & Brown, 2003). In short, a public-private key pair is generated. All entries written to the audit database are encrypted by the public key of the audit database. The private key is not held by any one participant in the organisation, but say, one half is held by the organisation's auditor, and the

other half is held by all other interested auditors (generally public sector Auditors General). Two auditors must be involved in any examination of the audit database records. Transactions can be further verified by using digital signature authentication approaches, if necessary. Any auditor can examine all transactions of a certain type but cannot inquire into the processes in the partner organisation that produced the records unless otherwise permitted to in law.

For clarity, the purpose of component systems writing all transactions to the audit database instead of only those involved in integrated transactions is two-fold: it is simpler to have systems always do something than conditionally do something, and the comparison of transaction results in integrated and isolated operations provides necessary contextual information for the assessment of accountable operation of the relevant information system.

This technology solution is not perfect. It means that ‘complete’ audits of the integrated service rely upon entirely electronic records but does not guarantee that any particular audit will be able to investigate the procedural actions that led the system to generate the electronic records. It does, however, provide a single source for all audit investigations, and that should promote better coordination between auditors with relevant access to generate a comprehensive view of the accountability of the integrated service’s operation. The solution is not the only thing needed to address accountability in the proposed organisation. It is complementary to the other necessary elements of good accountability practice, including clarity in governance, policy, and procedures (Barrett, 2001a, 2002a).

Conclusion

e-Government is sufficiently acceptable that “it will simply be the way government operates in the future” (Deloitte Research, 2000). The next steps in the e-government journey are not yet clearly defined, and they will not be easy; the low-hanging fruit has been picked, citizen expectations have been piqued and are increasing (Accenture, 2003, National Office of the Information Economy, 2002). Although technology is slowly moving towards ready interoperability, the diversity of government approaches to administrative and policy matters will constantly challenge integrators.

To accommodate the citizen’s increasing expectation for e-government to simplify interactions with government and to hide the complexity of the bureaucracy needed to manage the complex policy issues of our time, integrated services that cross agency and jurisdictional boundaries are necessary (Barrett, 2002a, National Office of the Information Economy, 2002). To protect the autonomy of governments at different levels and to maintain the democratic principle of allowing people to elect representatives in line with their view of the delivery of representational capacity, these integrated services will be agglomerations of individually crafted components found in many jurisdictions and even in the private sector (Balmer, 1981, Barrett, 2002a). To coordinate the operation of these integrated services in some equitably-governed approach will require the creation of organisations with unique ownership structures, novel governance structures, and subject to innovative accountability regimes (Barrett, 2002a). Importantly, these organisations will be different to, and more complex than, current intergovernmental arrangements, because of the likely intimate involvement of private sector partners (Barrett, 2002a, 2003, Painter, 1998c),

and because of the detailed administrative nature of their operation, where daily transactions span multiple jurisdictions.

This paper recounted some of the complexity of such organisations and particularly discussed the apparent issues to be addressed in the accountability of an organisation that provides integrated services across tiers of government. It noted that the legal structures in place in Australia limit the extent to which any of the otherwise appropriate auditing entities could oversee such an organisation. These limitations may be addressed by changes to the law. However, the paper proposed a means where the technology that promotes the potential for highly integrated government services can provide a suitable basis on which the existing auditing structures and jurisdictional boundaries could reach far enough. This would allow the existing auditors to provide the necessary assurance to the public that these supra-governmental organisations meet the expectation of acting in the public's best interests without compromising the sovereignty and autonomy of government and private partners.

Bibliography

- Accenture 2003, *eGovernment Leadership: Engaging the Customer*, Accenture.
- Alston, R. 2002, *Government Online a Success as Australia Moves to a New Era of eGovernment*, Available: [http://www.dcita.gov.au/Article/0,,0_1-2_15-4_103828,00.html] (23 Aug 02).
- Balmer, C. J. 1981, 'Criteria for the allocation of responsibilities: an interpretive discussion', in *Towards Adaptive Federalism: A Search for Criteria for Responsibility Sharing in a Federal System*, Australian Government Publishing Service, Canberra, pp. 217 - 242.
- Barrett, P. 2001a, 'E-Government: Transforming Public Administration', in *Institute of Public Administration Australia*, Canberra.
- Barrett, P. 2001b, 'The Role of Watchdogs in this New Era of Partnerships', in *"Beyond Traditional Boundaries"*, *Institute of Public Administration Australia National Conference*, Sydney.
- Barrett, P. 2002a, 'e-Government and Joined-Up Government', in *Global Working Group Meeting*, Wellington, New Zealand.
- Barrett, P. 2002b, 'Governance and Joined-up Government – Some Issues and Early Successes', Australian National Audit Office, Canberra.
- Barrett, P. 2003, 'Public private partnerships – Are there gaps in public sector accountability?' in *2002 Australasian Council of Public Accounts Committees, 7th Biennial Conference*, Melbourne.
- Barrett, P. J. 1996, *Managing Risk as Part of Good Management - An ANAO Perspective*, Available: [<http://www.anao.gov.au/Web/wsPub.nsf/SpeechesByTitle/EA1B4CE68914DCEC4A2568FE000B41AC>] (16 Jan 02).
- Bozeman, B. 1979, *Public Management and Policy Analysis*, St Martin's Press, New York.
- Bozeman, B. & Bretschneider, S. 1986, 'Public Management Information Systems: Theory and Prescription', *Public Administration Review*, vol. 46, pp. 475 - 487.

- Bretschneider, S. 1990, 'Management Information Systems in Public and Private Organizations: An Empirical Test', *Public Administration Review*, vol. 50, pp. 536 - 544.
- Cole, J. 2001, *East Bay cities get e-government boost*, Available: [<http://eastbasy.bizjournals.com/eastbasy/stories/2001/09/10/story4.html>] (22 Jan 04).
- Considine, M. 2002, 'The End of the Line? Accountable Governance in the Age of Networks, Partnerships, and Joined-up Services', *Governance*, vol. 15, no. 1, pp. 21 - 40.
- Crompton, M. 2004, 'Light Touch' or 'Soft Touch' - Reflections of a Regulator Implementing a New Privacy Regime', National Institute of Governance, Canberra.
- Deloitte Research 2000, *At the Dawn of e-Government: The Citizen as Customer*, Available: [http://www.dc.com/obx/script.php?Name=getFile&reportname=at_the_dawn_of_egovernment.pdf&type=pdf] [Requires Free Registration]] (16 Jan 02).
- Department of Industry Science and Technology 1997, *Investing for Growth*, Commonwealth of Australia, Canberra.
- Haque, M. S. 2001, 'The Diminishing Publicness of Public Service under the Current Mode of Governance', *Public Administration Review*, vol. 61, no. 1, pp. 65 - 82.
- Jorba, A. R., Ruiz, J. A. O. & Brown, P. 2003, 'Advanced Security to Enable Trustworthy Electronic Voting', in *Third European Conference on e-Government*, eds. F. Bannister & D. Remenyi, Trinity College, Dublin, Dublin, Ireland, pp. 377 - 384.
- Mertz, D. 2001, *Understanding ebXML: Untangling the business Web of the future*, Available: [<http://www-106.ibm.com/developersworks/library/x-ebxml>] (24 Oct 03).
- National Office of the Information Economy 2002, *Better Services, Better Government*, Available: [http://www.noie.gov.au/publications/NOIE/better_services-better_gov/Better_Services-Better_Gov.pdf] (22 Jan 04).
- Organisation for Economic Co-operation and Development 2003, *The e-Government Imperative*, OECD, Paris.
- Painter, M. 1998a, 'After Managerialism -- Rediscoveries and Redirections: The Case of Intergovernmental Relations', *Australian Journal of Public Administration*, vol. 57, no. 4, pp. 44 - 53.
- Painter, M. 1998b, *Collaborative Federalism: Economic Reform in Australia in the 1990s*, Cambridge University Press, Cambridge.
- Painter, M. 1998c, 'Public Sector Reform, Intergovernmental Relations and the Future of Australian Federalism', *Australian Journal of Public Administration*, vol. 57, no. 3, pp. 52 - 63.
- Quiggin, J. 1999, 'The Future of Government: Mixed Economy or Minimal State?' *Australian Journal of Public Administration*, vol. 58, no. 4, pp. 39 - 53.
- Rainey, H. G. 1983, 'Public Agencies and Private Firms: Incentive Structures, Goals and Individual Roles', *Administration & Society*, vol. 15, no. 2, pp. 207 - 242.
- Rainey, H. G., Backoff, R. W. & Levine, C. H. 1976, 'Comparing Public and Private Organisations', *Public Administration Review*, vol. 36, no. 1, pp. 233 - 244.

- Singh, S., Ryan, A., Kelso, R., Laidler, T., Burke, J. & Tegart, A. 2001, *The User Perspective on Government Electronic Service Delivery*, CIRCIT@RMIT, Melbourne.
- Wettenhall, R. 2003, 'The Rhetoric and Reality of Public-Private Partnerships', *Public Organization Review*, vol. 3, pp. 77 - 107.
- Wolter, R. 2001, *XML Web Services Basic*, Available:
[\[http://msdn.microsoft.com/webservices/understanding/webservicebasics/default.aspx?pull=/library/en-us/dnwebsrv/html/websrvbasics.asp\]](http://msdn.microsoft.com/webservices/understanding/webservicebasics/default.aspx?pull=/library/en-us/dnwebsrv/html/websrvbasics.asp) (24 Oct 03).