

A Modern Odyssey in Search of Relevance

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Key words: Capacity building, GIM, spatial data infrastructure.

SUMMARY

A modern country has a voracious appetite for spatial information. The challenge is how to remove barriers inhibiting use of spatial information; link users and sources of information; and engender new value-adding services.

Surveyors are used to creating boundaries in order to separate and define individual interests. A new role is to remove boundaries. Barriers must come down between disciplines, economic sectors and communities of practice in order to deliver relevant services to society.

This paper aims to give a strategic overview of progress in Australia in developing a spatial information industry focussed on delivering better decision making across economic, social and environmental issues. The paper outlines a practical approach to dealing with conflicting interests found in a federation comprising independent government jurisdictions, a growing private sector and multiple disciplines.

Measures include addressing key issues such as natural resource management, marine administration, emergency management and counter-terrorism on the demand side. It is also necessary to look closely at the supply side, through implementing international best practices in spatial information management, amalgamating professional associations, creating partnerships between the public, private and academic sectors and investing in research and development of new innovative services.

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1. REMOVING BARRIERS

The past decade has seen significant investments made in collection and creation of digital spatial information. These investments can be measured in billions of dollars. In some cases the data collection has been part of traditional mapping programs, environmental monitoring and land administration transactions. However, different drivers are emerging that require a new understanding of the application and use of spatial data and information.

These new drivers include:

- Maximising the economic, social and environmental benefits from investment already being made in spatially referenced data;
- Facilitating industry development;
- Rising community expectations for online services;
- Globalisation;
- Technology;
- Changing societal priorities;
- Environmental degradation and natural resource depletion; and
- Protecting communities through measures such as emergency management and counter terrorism.

This changing landscape has uncovered a new set of problems for people engaged in collection, management, presentation and use of spatial information. These problems include:

- Immature institutional arrangements and user/provider relationships;
- Inconsistencies in the availability and quality of spatially referenced data;
- Inconsistent policies concerning access to and use of spatially referenced data;
- Incomplete knowledge about the availability and quality of existing spatially referenced data; and
- Lack of best practice in the utilisation of enabling technologies.

The experience in Australia is that these problems transcend economic sectors (the public/private sector divide), user communities and disciplines (traditional areas such as surveying and mapping). However, existing institutional arrangements and relationships are ill-suited to solving these problems. The fracture lines between agency, jurisdictional, practice and discipline entities act against collective effort to address the availability, quality, accessibility and utilisation of spatial data and information. The symptoms include “data silos”, duplication of effort, patch protection and barriers to data access.

The news is not all bad. We now hear more about efforts to overcome barriers, to dissolve borders between agencies, states and disciplines. There are efforts underway to construct national spatial data infrastructures, develop and adopt international standards and construction of value chains to underpin new e-government and e-business processes.

Experience also shows that these types of efforts need to be focussed on the user. Too often spatial information professionals are accused (rightly) of focussing on elegant technical solutions that do not address the real needs of users. But here's the rub – how do we know what a whole new group of users want? It was more simple in an environment where a piece of data was collected for a single use. Now data collected for one purpose can have many potential uses. Good examples can be found in the ubiquitous use of cadastral parcel data, vegetation data and built environment data for uses as divergent as land transfer and emergency management. Likewise, one form of presentation of these data does not suit all users. Users are now demanding products like property maps, reports on biota rights, environment assessments, fuel loading maps, bomb-blast modelling and critical infrastructure inventories, all using the same sets of data.

The key challenge for spatial information providers is to remain relevant to these new users, to be able to offer solutions related to new societal needs.

The strategy adopted in Australia to address these issues, to remove barriers and provide a more user-centric focus in the spatial information industry can be summarised as four steps:

- Partnership building;
- Institution building (or realignment);
- Capacity building;
- Creation of new innovative services.

It should be noted that these steps are primarily about people, not technology. Starting points have been an industry-wide plan, called the Spatial Information Industry Action Agenda (2001) sponsored by the Australian Government. The second is the Australian Spatial Data Infrastructure Action Plan for 2003-2004.

The Australian Spatial Information Industry Action Agenda identifies five goals as central to the future success of the industry:

1. Develop a Joint Policy Framework;
2. Improve Data Access and Pricing;
3. Increase Effective Research and Development;
4. Evaluate and Reform Education and Skills Formation;
5. Develop Domestic and Global Markets.

Priority areas for implementation of the Australian Spatial Data Infrastructure in 2003–2004:

1. Governance and partnerships
2. Access to data
3. Data quality
4. Interoperability
5. Integrability

2. PARTNERSHIP AND INSTITUTION BUILDING

ANZLIC –the Spatial Information Council for Australia and New Zealand comprises senior representatives of the Australian Government, the New Zealand Government, the six Australian State and two Territory governments. This partnership between governments has existed since 1986 and has addressed many of the policy issues encountered during the period of intense collection of digital spatial data during the 1980's and 1990's by all governments. The Council's focus was on sharing experience and developments and where needed to adopt best practices nationally in both Australia and New Zealand.

The Council adopted a new strategy in the late 1990's: to actively engage with major user groups to assist them to develop capacity to use spatial data; at the same time as supporting growth in industry capacity to supply user services.

The means of doing this was to establish strategic partnerships with peak bodies representing communities of users and to support development of new bodies representing the major engine rooms of industry development – the commercial sector and the professions.

Partnerships have now been established with natural resource management through the National Land and Water Resources Audit Advisory Council; with emergency management through the Australian Emergency Management Committee; with local government through the Australian Local Government Association; and more recently, with counter-terrorism through reporting to the National Counter-Terrorism Committee. In each case there have been phases of evidence collection, awareness raising, joint strategy development and implementation of joint projects. The approach has been to listen to user needs, match these with potential solutions and then trial or demonstrate the benefits of use of spatial information as a joint investment. All these activities are still in train.

The Australian Emergency Management Committee (AEMC) and ANZLIC are peak inter-governmental bodies for emergency management and spatial information respectively.

The mutual benefits to be gained by the emergency management community and the spatial information industry in Australia through working together are now well recognised. There is growing interest in spatial information for emergency management functions including prevention, preparedness, response, recovery and mitigation. The AEMC is in a position to enunciate desired national emergency management outcomes, whilst ANZLIC can provide access through its members to independent advice on how these might be achieved. The key is to leverage expertise from both the emergency management community and the spatial information industry, at both jurisdictional and national levels.

The areas of common interest between AEMC and ANZLIC can be characterised as the innovative use of policy, people and technology to create safer communities. A common aim is to make people more productive through use of spatial information.

(from the AEMC/ANZLIC partnership agreement)

These efforts within government have been matched with a new level of involvement from the commercial sector and the professions. The Action Agenda provided the impetus for creating new institutional arrangements within these two sectors. In 2001, a single body representing business interests was created as the Australian Spatial Information Business Association (ASIBA). In 2003, the five principle professional and technical associations amalgamated as the Spatial Sciences Institute (SSI). There has also been a new national focus in the academic sector through the Australian Spatial Information Education and Research Association (ASIERA).

The principle national partnership and institutional arrangements are now in place to support the capacity building phase.

3. CAPACITY BUILDING

Capacity building relates to improving the ability of users to use spatial information for their specific needs and enabling spatial service providers to develop and deliver services to meet these needs. There is also a place for a framework (a spatial data infrastructure) which assists users to find and access data and services. In Australia, there are a number of initiatives under way to develop the needed capacities.

Research and development facilities are fundamental to growing capacities for both users and providers. Australia has been well served in the past with high quality academic and research institutions and new technology providers, each meeting niche market needs. However, there has been a gap in some of the new spatial science areas that do not align easily with traditional discipline areas. These include development of spatial data infrastructures, spatial visualisation, analysis and modelling. There was also a need to develop strategic capabilities meeting emerging industry needs and user applications.

The response was to create the Cooperative Research Centre for Spatial Information in 2003. The centre is funded by a consortium of governments, small businesses and academic

institutions to the tune of \$A80m over seven years. The Centre will draw on existing expertise in Australia and overseas to carry out its five priority research programs.

The mission of the Australian Cooperative Research Centre for Spatial Information is to develop the concept of a *Virtual Australia*, uniting research and commercial innovation in spatial information. The Centre will harness Australia's recognised research and commercialisation strengths in spatial information technologies to create new opportunities and increased prosperity for all Australians. The research and development will utilise technologies such as global positioning systems, satellite remote sensing, and geographic information systems and will explore the development of spatial data infrastructures in Australia in support of *Virtual Australia*.

Development of people is another core capability building activity. The Spatial Sciences Institute has taken on the task of developing a national education and skills formation action plan, encompassing learning opportunities from kindergarten to continuing professional development in the workplace. Delivery will be achieved through existing education and training providers, the business and professional associations, government agencies and new institutions such as the Cooperative Research Centre.

ANZLIC has focused on capacity building in user communities. It has used its partnerships to develop and implement best practices in spatial data management in natural resource management and local government. It is working with emergency managers to develop training materials relevant to operational needs and to use spatial information as part of a national knowledge network.

Natural Resource Information Management Best Practice Toolkit

The Toolkit aims to:

- Build capacity at regional and local levels to manage, utilize and share natural resources data and information more effectively.
- Increase the awareness, understanding and skills of individuals responsible for data and information management in natural resource management (NRM) projects in the first instance. The longer-term goal is that the toolkit will be generic enough to be used in any project with minimal modification.
- Facilitate the development and adoption of internationally accepted standards and guidelines for information management and thereby promotes best practices in information management.
- Give participants in NRM projects access to practical information management tools to reduce set up costs and duplication of effort.
- Support the development of community networks through open and efficient sharing of information resources and knowledge, and assists the establishment of information loops between Regional, State and National levels.
- Ensure the sustainable management of data used or created in projects.
- Allows others to fully exploit the information generated from NRM projects.

The Toolkit can be viewed at www.nlwra.gov.au/toolkit/

The public and private sectors have also created evidence on beneficial uses of spatial information, starting with the ANZLIC Benefits Study in 1996. More detailed studies have been undertaken recently in emergency management and counter-terrorism.

4. NEW INNOVATIVE SERVICES

Analysis of needs has led to project funded by the Australian Government, with State government agencies and private businesses providing in-kind resources, aiming to develop demonstrations of the power of interoperable spatial services offered by the private sector to assist in emergency management. The total resources available to the project are around \$A2.8m. The project aims to implement interoperability elements of the ASDI to help demonstrate how user-focussed services can be provided by the private sector. These services are made possible by adoption of new international best practices developed within the global standards community. The project is due for completion in 2005.

New services are also being built through initiatives such as web-based natural resource atlases providing access to data across agency and jurisdictional borders, community of practice portals using spatially-enabled technologies and use of high-resolution satellite imagery. The shared resourcing models used in these initiatives are squarely based on the outcomes of institution building and enabled by the increasing capacity and confidence in both the spatial information industry and targeted user communities.

5. CONCLUSION

The search for relevancy of spatial services and technology to an increasing range of users is far from over. In Australia, users are questioning the value of products and services traditionally delivered by disciplines such as surveying, cartography and remote sensing. Their needs are changing and it is essential for service providers to take heed of these changes and to themselves change. Learning to use new technologies is not enough. The challenge is to learn what questions user communities are asking and to create solutions to meet these needs.

There is no single approach to this issue. This paper has outlined an approach being taken in Australia. The experience outlined here is that strategic directions need to be set, frameworks and institutions put into place and both users and service providers enabled to perform. There is insufficient room here to document the amount of work being done by individuals and organisations in government agencies, private enterprises and research bodies to answer the challenge from their users.

And maybe we will be successful.

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<http://www.anzlic.org.au/infrastructure/>

Australian Natural Resources Information Best Practice Toolkit

<http://www.nlwra.gov.au/toolkit/>

BIOGRAPHICAL NOTES

Paul Kelly has extensive experience in the development of spatial information policy and practice at national, state and local levels.

ANZLIC – the Spatial Information Council of Australia and New Zealand – created a National Office in 2001 with full-time staff to accelerate its work program and deliver the vision that Australia and New Zealand will have easily accessible and usable spatial information. Paul is the first Executive Director of the National Office. As such, he works for every government in Australia and New Zealand.

Prior to his current appointment, he was an Executive Director and Chief Information Officer in a state agency, tasked with delivering information management and technology strategies and services. He also chaired the board of an interagency group comprising twelve agencies tasked with implementing a whole of NSW government natural resource information management strategy involving a web-based distribution network.

Paul is currently a member of national strategic policy development groups within a wide range of communities of practice, including spatial information industry development, standards implementation, natural resource management, marine environment, emergency management and land administration reform.

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