

1 The Current Situation

1.1 Introduction

The previous chapter discussed concepts that were related to the concept that is being investigated by this thesis. This chapter, The Current Situation, is an outline of some of the current, or recently completed, projects that are taking place around the world. In many cases the concepts outlined in the previous chapter are used in these projects. The chapter looks at each of the projects and describes the concepts and technologies behind them. The projects that are described in this chapter include Victoria's GI Strategy, DOIs GI Strategy, Land Channel, GI Connections, the ANZLIC Metadata Guidelines, the Australian Spatial Data Directory, BLIN and the New Brunswick Real Property Information Internet Service.

The chapter is separated into three sections, being:

- Victorian Developments;
- National Developments;
- International Developments;

1.1 Victorian Developments

1.1.1 Victoria's Geospatial Information Strategy

1.1.1.1 Introduction

In 1997 the Department of Natural Resources and Environment developed a Geospatial Information Strategy for Victoria. The strategy is based on establishing a geospatial information (GI) environment which has the ability to provide a strong business focus to the development of the GI industry in Victoria (DNRE 1997c). Its aim is to provide access to Victoria's geospatial data resources in a coordinated, consistent and cost effective manner that will benefit all Victorians. It aims to support the development of GI by all stakeholders in the Victorian geospatial industry, which including local government, regional groups, utilities, academia and the private sector.

1.1.1.2 Strategy Programs

As part of the overall GI strategy, 5 major programs have been established in order to achieve the strategies targets. The programs that have been established are named:

- 1) Policy Framework
- 2) Infrastructure
- 3) Education & Awareness

Situation

- 4) Marketplace
- 5) Business Systems Development

1.1.1.1.1 Strategy Program 1: Policy Framework

The policy framework program is intended to establish and maintain policies, procedures, guidelines and standards dealing with the establishment of the GI framework including the concepts of metadata, quality management, privacy, liability, licensing, pricing, custodianship and intellectual property (DNRE 1997c).

1.1.1.1.2 Program 2: Infrastructure

The Infrastructure program involves the establishment and maintenance of the GI environment according to the policy framework and to establish the operational structure necessary to implement the strategy. The infrastructure, or operational structure, that will need to be developed to allow the strategy to be a success has three parts, the Information, Access Infrastructure, and the Customer interface (DNRE 1997c).

1.1.1.1.1.1 Information

Without doubt the information is the foundation of the operational structure, for without it everything else is inconsequential. The base layer consists of the geodetic framework, upon which rests the core datasets of the SDMB (DNRE 1997c).

The information level of the operational structure is intended to be client neutral – that is the data should be available for direct access via a variety of systems which may change from time to time, depending on the current technology. Access to the information is not to be limited by the vendor or the agency specific technology (DNRE 1997c).

1.1.1.1.1.2 Access Infrastructure

There are three components to the access infrastructure. These are the:

- 1) Policy Framework, which includes aspects like:
 - licensing
 - data standards
 - quality management
 - metadata
- 2) Physical Network Infrastructure. This is highly dependent on the technology available at the time. Provisions are to be made so that the infrastructure can adapt to new technologies; and

Situation

- 3) GI Marketplaces, which are to provide public access to a wide range of information. Programs such as GI Connections, clearinghouses, and LandChannel all fit into this section (DNRE 1997c).

1.1.1.1.1.3 Customer Interface

The customer interface creates business solutions for the stakeholders by providing a business end for customers. A key component of the development of the customer interface is that customer requirements must be taken into considerations to improve customer service (DNRE 1997c).

1.1.1.1.3 Program 3: Education and Awareness

If the GI environment vision is to be achieved, one of the major achievements that has to occur is the raising of the communities awareness as to what GI can do for it. This program aims to increase community awareness and understanding of GI. It will have activities that will promote skills development, marketing, GI in schools, research activities and opportunity awareness (DNRE 1997c).

1.1.1.1.4 Program 4: Marketplaces

The aim of the marketplaces program is to establish a GI marketplace. Included in this is the undertaking of comprehensive customer needs assessment, promotion of the marketplace, and distribution (Internet access, GI Connections, Electronic Service Delivery, Land Channel, and Multimedia). Another important aspect will be the monitoring of customer satisfaction to determine how the marketplace can be improved (DNRE 1997c).

1.1.1.1.5 Program 5: Business Systems Development

The final program is intended to support the development of geospatial decision support systems which will implement proposals arising from the vision statements prepared for designated Strategic Development areas (DNRE 1997c). Areas in which this program intends to focus are:

- Land Administration
- Industry Development
- Socio–Economic Planning
- Environment and Planning
- Transport and Logistics
- Emergency Management
- Infrastructure Development

Situation

1.1.1.3 Geospatial Information Pricing Policy

A new pricing policy for geospatial information is to be introduced in Victoria which has the aims of achieving the greatest possible use of GI and creating and stimulating the growth of the markets using GI (DNRE 1997b). Until recently the price of geospatial information has been high, and as such has made the purchasing of the information prohibitive to many potential customers. As the cost of collecting and maintaining the data went up, so did the price of the information to the customers. This often resulted in the loss of customers, meaning the custodian would have to increase the price again to cover the costs.

The new pricing policy has taken the approach that if the price of the information is affordable to all those who may wish to use it, enough customers will purchase it to allow the custodian to recover their costs. The new lower prices will help to achieve the two aims of greater usage and growth in the markets, and it will also encourage “non-traditional” users of GI to become involved in the GI industry, thus increasing the health of the industry. As part of the new policy both the private and public sectors will pay the same amount for GI, and both will be eligible for credits if they contribute information to the dataset. Subsidies will be available to those non-profit environment or education organisations wishing to purchase data (DNRE 1997b).

1.1.2 DOI GIS Strategy

1.1.2.1 Introduction

The Department of Infrastructure (DOI) was established in April 1996 through the merger of various business units and agencies with an “Infrastructure” focus. Its establishment brought together business units and agencies with a variety of GIS hardware, software and data investments. A strategy has recently been developed to put in place a common framework for the implementation of GIS technology in the DOI and to establish appropriate data management and coordination in the DOI and its associated agencies.

The strategy has been developed to be information based rather than hardware or software based. It is built on a set of portfolio wide information standards. The strategy does not propose a central GIS capacity.

1.1.2.2 Recommendations

The strategy came up with the recommendations outlined below.

1) Establish the State Digital Map Base (SDMB) as the common spatial base for the Department

The SDMB will be acquired as a resource for the entire portfolio under a single license for all the DOI divisions and agencies. All geospatial information that is acquired from the time that the SDMB is adopted will be required to be in conformance with the SDMB and at the appropriate quality standards (Thompson

Situation

1997). The decision to adopt the SDMB as the common spatial base is due to the decision that a common spatial base is required as well as common spatial boundaries.

2) Core data sets and data custodians

Each of the datasets that are of importance across the portfolio, the key datasets, will become the responsibility of a single custodian, who will be responsible for the definition, quality and availability of that dataset. The choice of who the custodian will be is to be determined by who normally produces the data set, who has the greatest interests in the quality of the data, who depends on having the data accurate and up to date to do their job, and who is in the best position to influence the quality of the data (Thompson 1997).

3) Data transfer standards

A common data transfer standard has been developed to make the sharing of data much easier. All data transfer within the Department will conform to the following standards:

- Where a common spatial base is in use, and data conforms to common spatial units/boundaries, only the attribute component of spatial data should be transferred. In the future this should be the case as all data will conform to the SDMB and the ASGC;
- Where transfer of the spatial data component is necessary and a platform to platform translation is not available it should, where possible, be first converted to attribute data; and
- Specific data transfer protocols will be developed and implemented as required (Thompson 1997).

The range of GIS software platforms in use in the Department creates problems in regards to data transfer. For this reason rationalisation, where possible, is encouraged (Thompson 1997).

4) Metadata

The DOI has become aware of the importance of metadata and the role that it serves within the organisation by retaining corporate knowledge of the characteristics of the datasets that the agency uses. For this reason each of the data custodians will be responsible for the creation and maintenance of metadata. The ANZLIC Metadata guidelines have been adopted as the format for the metadata (Thompson 1997).

5) *Geospatial application*

The DOI is primarily concerned with data analysis and presentation, as opposed to data acquisition. This involvement takes place at two levels – The GIS specialist who uses specialist GIS software, and a wider range of irregular, intermittent users with a lower level of GIS skills and a corresponding lower functional requirement. A GIS

Situation

browser and metadata browser application for use throughout the Department is to be developed to cater for the second of these two groups. Each of the business units and agencies will use their discretion as to whether they use the application or not (Thompson 1997).

This is essentially the area that the research in this thesis is aimed at. It is likely that the Geospatial application, GIS browser, will allow access to one or more homogeneous datasets at once, display them on the screen, and allow simple GIS functionality. It is unlikely at the stage of writing this thesis that the application would allow heterogeneous spatial data to be viewed/queried at once. This is the area of research that this thesis is involved in. It would be of great use to the DOI to be able to view/query multiple heterogeneous data sets at once using the one browser as it would allow distributed processing and hence a more efficient Department.

1.1.3 Land Channel

1.1.3.1 Introduction

One of the current projects being undertaken by the Victorian government is the electronic services delivery (ESD) project. The project is part of the Victoria 21 strategy of promoting economic development through encouraging multimedia and related activities to improve customer service.

The ESD project has the following aims:

- Improve customer service. For too long service delivery systems have been designed to satisfy the operating requirements of the provider rather than the customer;
- Make government services more accessible;
- Lower the cost of doing business;
- Open the opportunities for new services and products;
- Coordinate the delivery of services and information by different agencies and spheres of government; and
- Stimulate the development of local communication and information technology industries and the Victorian economy at large (DNRE 1997a).

Multimedia Victoria, the government department responsible for the ESD project, have progressed satisfactorily with several services, including the Citizens Channel and the Business Channel. Through DNRE, Multimedia Victoria are in the process adding another service channel to the ESD project. The service, Land Channel, will provide a single point of access to Government land information by integrating service delivery across agencies. Clients wishing to gain access to land information and conduct commercial transactions, will be able to do so at their convenience without the need to understand the underlying structure of the government (DNRE 1997a).

Situation

Initially the types of technology that will deliver the Government services are the Internet, kiosks, and telephone transactions (IVR).

1.1.3.2 Implementation

The Land Channel is being implemented in three stages, as described below.

1.1.1.1.6 Stage 1. Land Information available via the Internet

The first stage of Land Channel was completed in late May 1998 and involved the setting up of a service that provides land information over the Internet. The development of the overall strategy, information flow, content mapping and quality assurance processes for the project was handled by the specially formed Land Channel Working Group. Each department, business unit and agency was required to develop their own strategies for the content that they contributed (DNRE 1997a). The information that is available at this stage is predominantly of an introductory nature. E.g.: An introduction to Discharge of Mortgage or a Guide to Government requirements when buying a house.

1.1.1.1.7 Stage 2. Land Information and Transactions via the Internet and Kiosks

Stage two of the implementation of the Land Channel will be to add the first of the transactions, both financial and non financial, and to extend the services to kiosks and IVR. Some examples of potential business transactions which may appear at this time on the Land Channel include the sale of property sales information, the sale of map information, electronic updates of the Survey Practice Information and the electronic distribution of the Land Titles Office lodgment forms (DNRE 1997a).

1.1.1.1.8 Stage 3. Land Channel and Electronic Commerce

Departments, business units and agencies will over the next five years need to ensure that electronic service delivery is a key component of their business. The reason for this is the stated objective of the Victorian Government to have all its services conducted electronically by the year 2001. Land Channel and Multimedia Victoria will lend great support to each of the Departments, Business Units and Agencies in helping to achieve this aim (DNRE 1997a).

1.1.3.3 Audience

Out of the number of potential audiences that were identified for the land channel project it was decided that the initial focus would be on the "Individual Occasional" users. Users in this audience are made up of individuals who will infrequently access land information, an example of which is an individual selling their home. These people are likely to be unaware of the specific information they require and as such are candidates for facilitated guidance to information at an introductory level. This audience was chosen as the main focus group as it was believed that the largest scope for improvement in the level of service could be obtained in the shortest time frame

Situation

for these people. The group also has a diverse enough base to provide a proof of concept for the project (DNRE 1997a).

1.1.3.4 Distributed Authoring

Due to the large size and scope of the Land Channel project the traditional Internet authoring techniques do not provide the flexibility or scalability required to be successful. In consultation with other channels, Land Channel has adopted the philosophy, methodologies and technologies of the "Distributed Authoring" model. This model facilitates the appropriate distribution of ownership and focus by separating the content from the technology and the navigation from the documents.

The distributed authoring model allows for the direct incorporation of text, graphics and media rich content, as well as the use of object oriented techniques to provide access to databases and real time services. The model also allows for the agencies/business units to remain in charge of their information, while the Land Channel provides its chosen communities of interest with an easy navigation method across government.

1.1.4 GI Connections

1.1.4.1 Introduction

GI Connections is a new web site that was launched in May 1998 and has replaced the old Geographic Data Victoria and GISNET web sites. Its main intention is to provide a site that is a searchable directory of material that is related in some way to geospatial information for Victoria. Geospatial information are any facts which can consist of information or data which are spatially referenced to a point on the earth.

The aim of the site is to:

- improve access to Victoria GI for the GI industry,
- highlight current items of interest for both new and regular users,
- link to GI suppliers and enable access to metadata and detailed data sets,
- provide links to other sites relating to GI such as research information, training, clearinghouses and education institutes.
- provide State Government policy statements on GI (DNRE 1998).

1.1.4.2 Features

The rest of this section on GI Connections will go into more detail on the above features of GI Connection.

1) Victorian Spatial Data Directory

Situation

The Victorian Spatial Data Directory (VSDD) is a feature of the GI Connections site that allows a user to find out what spatial datasets exist within Victoria, along with the geographical extents, currency, status, access conditions, quality and contact information for the data. Every dataset that is listed in the directory has a metadata record that describes the aforementioned features of the dataset. The metadata records are in the format that was developed by ANZLIC, the ANZLIC Metadata Guidelines.

The directory includes both current and archived data and the contribution and maintenance of the metadata entries is undertaken by the custodian of the dataset. The directory can be searched in three ways, by predefined search words, using a free text search, and finally searching by the contact points for the datasets.

2) The State Digital Map Base

The State Digital Map Base feature of the GI Connections site allows a user to find out information about the Cadastral, Topographic, and State Digital Road Network aspects of the SDMB. It allows the user to view the metadata records, product descriptions, sample data, pricing and licensing agreements for each of the three aspects of the SDMB. Finally order forms are supplied on the site that allows the user to print them out and order the parts of the SDMB that they require. The order form feature is intended to be available online in the future so as though the SDMB can be order across the Internet.

3) State Government GI Policy Statements

This feature of the web site lists all the recent policy statements that have been generated by the Victorian government that deal specifically with Geospatial Information. All these documents are available for viewing online, with hyperlinks to them from the main listing. A facility for feedback is provided. This allows readers of the policy statements to have their thoughts heard on these policies.

4) Links to other GI sites of significance

This feature of the web site provides links to other web sites that may be of interest to users of geospatial information. Links have been provided in the areas of government, educational institutes, research, training, GI software and hardware, consultants, value added retailers, data brokers, data managers, utilities, and other relevant sites. There is also an intention to add links to map retailers, GPS retailers, aerial photography, satellite imagery, clearinghouses, and database sellers. A facility has also been added to allow a user to add their own entry to the site.

5) Map Viewers and Sample Data

This feature of the web site allows for the viewing of the State Digital Road Network online as well as the downloading of some sample data from the topographic, cadastral and state digital road network layers of the state digital map base. This feature is essentially a testing ground for the developers of GI Connections to develop new ways of disseminating the SDMB to potential users. It should be noted at this point that the online viewers are, at the time of writing this thesis, not yet functional.

1.2 National Developments

1.2.1 ANZLIC Metadata Guidelines

The ANZLIC metadata guidelines were developed over an 18 month period by the Australia New Zealand Land Information Council. They were developed with the input of every state, with the intention of producing a format for metadata that could be used throughout Australia and New Zealand in national land and geographic data directory systems (ANZLIC 1996). The metadata working group that was formed by ANZLIC developed a set of core metadata elements that were believed to be all the elements that were required for the data directories. This set of core metadata consisted of 31 elements that would adequately describe geographical extents, currency, status, access conditions, quality and contact information for the each of the datasets.

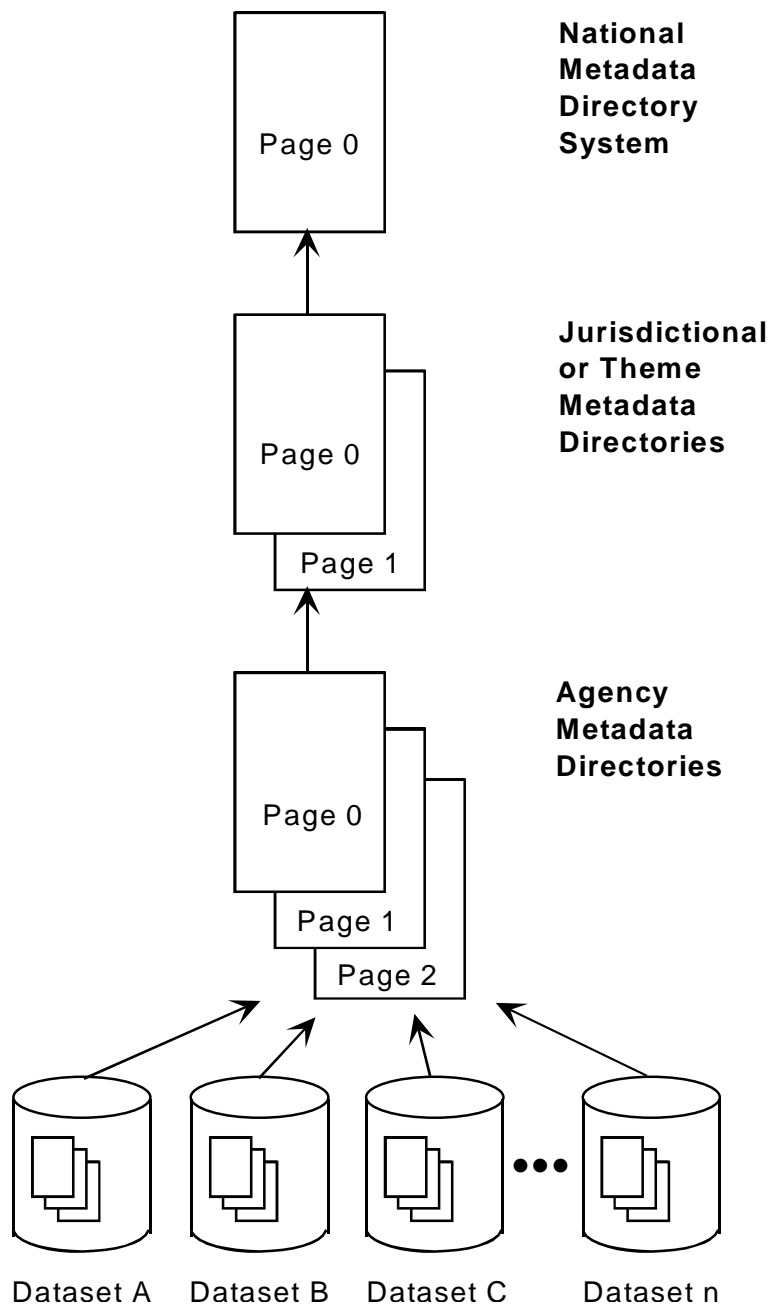
Situation

Figure 1-1: The Pages Concepts (ANZLIC 1996)

There are many more possible metadata elements that could have been placed within the core set. This is evident in the fact that the United States metadata standard has 220 elements in it. It was decided by the ANZLIC working group that to add all these to core set would make it too cumbersome. To allow for these extra metadata entries to be added on top of the core set it was decided that a pages approach for the guidelines should be adopted. Figure 1-1 shows the pages approach. In the pages the core elements are stored at the page 0 level along with another entry which is a link to page 1. This allows individual agencies to add any additional metadata to their metadata that they think they need at the page 1 or subsequent levels.

1.2.2 Australian Spatial Data Directory

1.2.2.1 Introduction

One of the main reasons the ANZLIC metadata guidelines were developed was to facilitate the development of the Australian Spatial Data Directory (ASDD). The ASDD is intended to be a searchable listing of all the public and private spatial datasets that exist within Australia. Each dataset that is listed within this directory is to have a metadata record associated with it that is able to be viewed. It is to be a national version of the spatial data directory that exists on the GI Connections web site.

The ANZLIC Metadata Working Group is in the process of examining user requirements and technologies for a distributed Australian Spatial Data Directory. The strategy to develop and implement a national land and geographic data directory system for Australia and New Zealand is designed “to maximise community access to land and geographic information with due regard for issues of privacy and confidentiality” (ANZLIC 1997).

Two main achievements have come from the work so far, being a user requirements survey and a prototype.

1.2.2.2 User Requirements Survey

The ANZLIC Metadata Working Group conducted a survey of user requirements for the Australian Spatial Data Directory in June 1997. What follows is a brief summary of the results of the survey, taken from the PDDD Project Evaluation that are of relevance to the Prototype Distributed Data Directory that was developed.

1) Access to the ASDD

- 91% of users surveyed have access to the WWW on the Internet.
- 65% of users surveyed would like to access the ASDD online via the Internet.

2) Requirements of the ASDD

- Spatial Searches – Searching by one or more defined regions, e.g. mapsheets, (mandatory by 57% of users surveyed), or via a bounding rectangle (mandatory by 56% of users surveyed) were the most popular methods of spatial searching.
- Textual Searches – Searching via pre-defined search words was considered mandatory by 71% of users surveyed. Searching of data based on the available format types (e.g. Digital or Non Digital) was considered mandatory by 42% of users surveyed. Searching based on data currency was considered mandatory by 36% of users surveyed. Searching by one or more custodians was considered mandatory by 29% of users surveyed.

Situation

- Displaying Search Results – 96% of users surveyed preferred search results to include both text and map combined.
- Generating Reports of Search Results – 59% of users surveyed preferred printed reports generated to include both text and a map report.

3) Metadata in Users Agency

- 79% of users surveyed were willing to contribute their agency's metadata to the ASDD. 54% of the users surveyed believed that their agency would prefer to manage access to their metadata themselves within a distributed ASDD.

1.2.2.3 Prototype

As part of the process of developing the ASDD, ERIN, Land Victoria and WALIS have developed a prototype distributed data directory to demonstrate the technology that could be used for the ASDD and to assist the working group with identifying implementation issues that will have to be solved.

The prototype recently had 1261 metadata entries that can be queried, 24 of these were held at ERIN in Canberra, 430 were held at Land Victoria, and the other 807 were held by WALIS in Perth (Hatton 1997a). The prototype does a live search of the metadata held at these three sites and is able to rank the results of the search according to how useful they are likely to be.

The prototype at this stage has only one entry point, which is located at the ERIN web site. In practice there could be any number of entry points, all with slightly different interfaces to search for different subsets of data first. The prototype demonstrates direct access to a number of directory systems that are distributed in Victoria, Canberra, and WA as shown by the above system architecture. The prototype is currently searching text based directories at both the WALIS and Land Victoria sites while a relational database (Oracle) is being accessed to retrieve metadata records from ERIN. This architecture allows the maintenance of metadata close to its source and overcomes the update problem common to centralised directories. Figure 1-2 shows the architecture of the prototype.

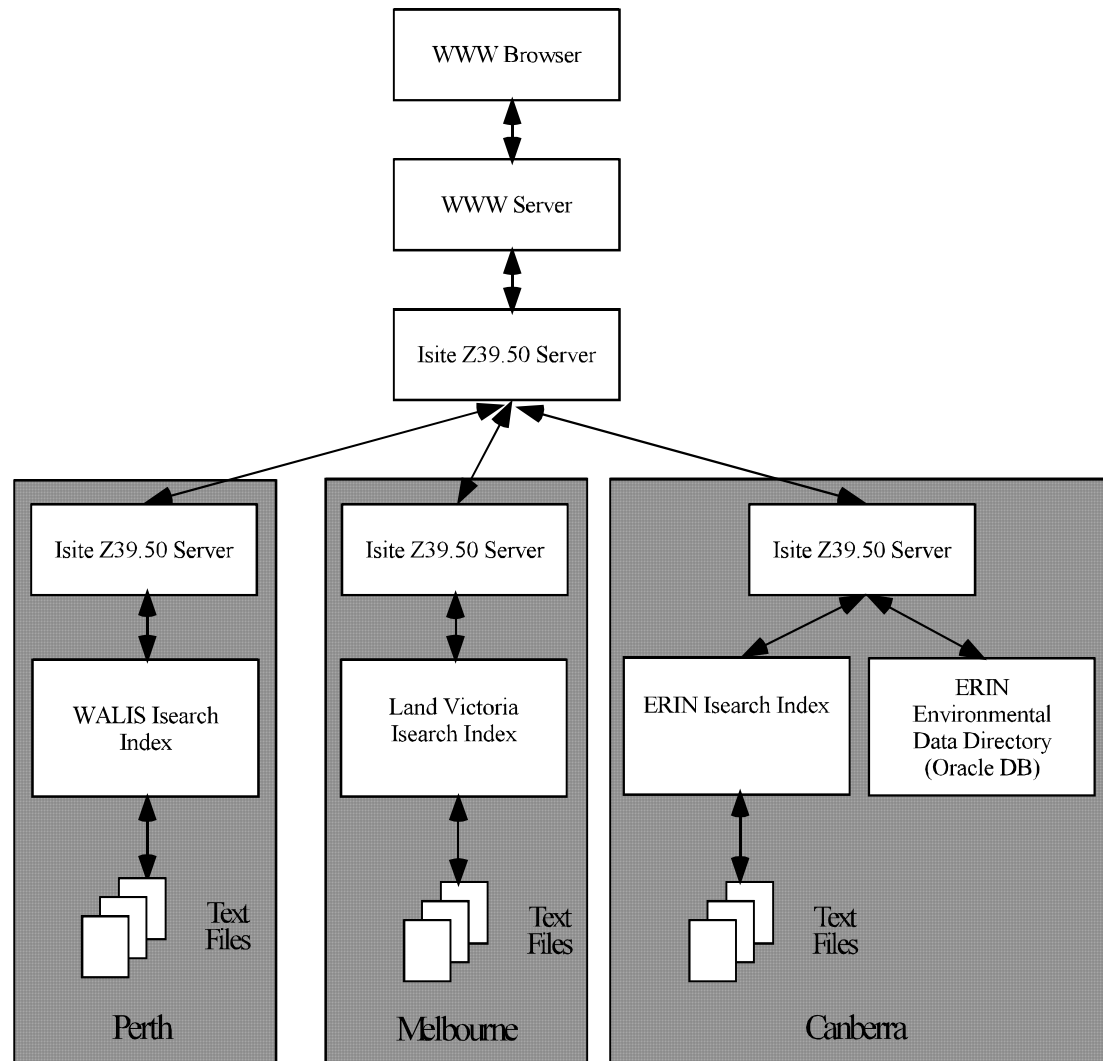
Situation

Figure 1-2: Structure of the Prototype Distributed Data Directory (Hatton 1997b)

1.2.3 The Basic Land Information Network – BLIN

The Basic Land Information Network (BLIN) is a product developed inhouse by the Department of Natural Resources (DNR) in Queensland. It is a network that brings together a selection of key elements from different databases. It allows single point access to a variety of the Departments databases. BLIN is available at Land Service Centres across Queensland in all the Department's District offices. The products and services that BLIN provides are only available at DNR Offices throughout the State of Queensland. At this stage these are the only locations that have online access. The databases that are networked include:

- The Digital Cadastral Database (DCDB);
- The Integrated Valuations and Sales database (IVAS);
- The Automated Titles System (ATS);
- The Survey Control Database (SCDB);

Situation

- The Computer Inventory of Survey Plans (CISP); and
- The Image Library of scanned survey plans, or Document Library (Rush 1997).

The DNR intends that other databases will be added to this network and that the existing databases will have upgraded services developed in order to enhance the output as business requirements dictate. An example that the DNR states is that they have a large natural resource information database which would be a great benefit to include, as it has management information on soils, water and climate.

The DNR developed two distinct BLIN applications, being

- BLIN GIS; and
- BLIN Enquiry.

BLIN GIS as the name suggests is a Geographic Information System with the full analysis and manipulative powers of a regular GIS. The GIS allows professional users such as valuers and real estate agents to process, display and analyse information from all the databases that BLIN is connected too (DNR 1997). It could be said that the system, from the users point of view, is a data warehouse with the one difference being that the information is not all stored in one centralised database. To the user it appears as though the data is all stored in the one location.

BLIN Enquiry is a low cost enquiry engine that is now available too all staff of the DNR. It provides the ability to make land information inquiries by accessing the DCDB, IVAS and SCDB. Information can be displayed on screen, printed off in the form of a condensed textual report and/or a map of the details printed. (DNR 1997)

BLIN Enquiry has the ability to:

- Produce a number of standard map products – Cadastral, Surveying, Valuation, and Property Purchase data. The system also has the ability to customise maps for clients to meet their specific requirements. The customised mapping facility does however attract a 50% surcharge to the price of the standard products.
- Make simple inquiries about any specific block of land in the state;
- Produce a computer derived map of any area of interest in the state;
- Obtain a map of a land holders property or locality showing Lot, Plan, Area, Tenure, Sale Price, Date of Agreement and Valuation information;
- Obtain Survey plans – a plan of survey of your land showing dimensions and area;
- Obtain a map showing Permanent Survey marks for an area in the state (DNR 1997).

Searches for a particular property are launched by using familiar information that every user will know, like the name of the street the person lives in. BLIN then leads

Situation

the user to that neighborhood and offers a choice of land information to the user. Searches can also be conducted by progressively zooming into the area of interest by the use of a key map (Lennon and Berenyi 1997).

The DNR is in the process of developing an Access Management Environment. When this is installed it will allow clients outside the DNR to gain access to the system. At the present time there are no security or accounting mechanisms in place to restrict and monitor access to the system, hence the restriction of only having entry points in DNR offices. The Access Management Environment adds security and accounting mechanisms on top of the existing system.

1.3 International Developments

1.3.1 New Brunswick Real Property Internet Information Service

The New Brunswick Geographic Information Corporation (NBGIC) was formed in 1990 by the province of New Brunswick, in Canada, to manage its land administration infrastructure. NBGIC provides product and services to its customers through online networks and 11 regional offices. Its clientele include federal government agencies, municipalities, lawyers, surveyors, appraisers, realtors, financial institutions, utilities, engineering and planning consultants and resource based industries (Arseneau, *et al.* 1997b).

The New Brunswick Real Property Information Internet Service was launched commercially on May 5, 1996 after a three month development period undertaken by Universal Systems Limited (USL) of Fredericton on behalf of the NBGIC. The service has three databases that are all linked together and are able to be viewed using a WWW browser. According to Arseneau et al. (1997a) these databases are:

- The Property Assessment and Taxation System (PATs) Database. This database contains information that supports the property value and tax credit programs.
- The Parcel Index Database. This database contains the ownership information on the 500,000 land parcels in the Province, as well as providing a parcel based index to registered documents for each of the parcels.
- The Property Map Database. This database contains a digital graphical representation of the parcels in the Province and is maintained on a regional basis.

It should be noted at this point that only non-confidential subsets of data from these databases are able to be viewed. This is achieved since the data that is viewed is not the actual data that resides in NBGIC's databases, but instead a cut/copy of it that is located at USL on its server. Any data is deemed to be confidential in nature is simply not copied from the NBGIC database to the database located at Universal (Arseneau, *et al.* 1997a). New data is delivered to Universal from NBGIC via tape.

During the three month development period many special purpose software components were added to the CARIS Internet ServerTM. The software allows the user

Situation

to view and query maps, query attributes from external databases, select display layers, perform point in polygon analysis, and many more core GIS operations (Arseneau, *et al.* 1997b).

Clients who access the service have the ability to search for a property by specifying either a textual or graphical attribute, place name or coordinate information (Arseneau, *et al.* 1997b). With regards to place name searches, the New Brunswick Gazetteer from the Canadian Names database is used to retrieve the coordinate information for the location of the place name. Once a coordinate value has been derived for the search it is passed to the CARIS Internet ServerTM so that the map image can be rendered. The map that is displayed on the screen will be centred on the specified location.

The service is password protected, so as only those who have an account with NBGIC have the power to access it. When the service was first introduced a pricing policy was introduced that would not only cover the costs of developing the service, but would also cover the potential cost of losing revenue from other services that may no longer be as relevant as the once were (Arseneau, *et al.* 1997a). A pricing policy of charging for each textual search conducted, as well as a charge to access the digital property index map (unlimited pans and zooms) was introduced. After a testing period to track the usage and test the billing algorithm on this policy, a decision was made, with the input of customer feedback, that a logon time charging policy should be adopted (Arseneau, *et al.* 1997a). In this approach clients would be given ten hours logon time for \$100 per month. Any client that exceeded this maximum time would be subsequently charged at \$10 per hour, or part thereof.

1.4 Chapter Summary

This chapter has outlined some of the projects and policies that are being, or have been, implemented at the state, national and international levels. All of the projects and policies that have been outlined in this chapter have had a goal of improving the use of spatial data throughout the organisation that implemented them as well as the general community. This is a similar goal to that of the concept being researched in this thesis.

Victoria's Geospatial Information Strategy and the DOI GIS Strategy are two policy documents that were developed by Victorian government departments with a view to improving the use of spatial data within the departments as well as improving the use of it in the general community. Issues such as pricing policies, data custodianships, metadata collection and distribution, data transfer standards, access infrastructure and education are all covered within the documents. Both policies are of particular relevance to the concepts being investigated within this thesis. There is not much

Situation

point developing a metadata engine that is never going to be used since it does not fit into the vision or direction of the government.

Land Channel and GI Connections are two online Victorian government initiatives that have a primary aim of disseminating information and services dealing with spatial data across the web. Land Channel deals primarily with the delivery of spatial data services that are already available over a counter in a government department. It is part of the ESD project of the current government. GI Connections is intended to be a searchable directory of material that is in some way related to spatial information for the state. Both of these projects are essentially first steps in the process of achieving the objectives of this thesis. Whereas both of these projects allow users to search for spatial data, perhaps even buy it, they do not allow for all the results of a users search to viewed concurrently online. This is the intention of the thesis.

The Australian Spatial Data Directory is searchable listing of Australian public and private spatial datasets. Each of the datasets that is listed within the directory has a metadata record associated with it that conforms to the ANZLIC metadata guidelines. This project is extremely relevant to the concepts being investigated in this thesis as it is the first step in developing a distributed system. The Australian Spatial Data Directory allows the user to search for certain datasets and returns the corresponding metadata records as the result. The concept being investigated in this thesis will go one step further and also allow the actual datasets to be viewed and queried.

BLIN is an initiative that was undertaken by the Department of Natural Resources in Queensland. It allows single point access to a variety of the Departments databases concurrently. The project essentially achieves what is intended in this thesis. It allows for the distributed processing of spatial data across a network. It does however have a few differences. Firstly the application is not available on the Internet. Secondly, the application is not easily extendable due to the fact that all the functions, locations of datasets, etc are all hard coded into the application. If new datasets are to be added to the system a lot of code will have to be changed. Thirdly, each of the datasets are stored in the same proprietary format. It is intended that in this thesis the datasets being accessed could be stored in any format. Finally, all the datasets are located on

Situation

the local network. It is intended in this thesis that the datasets could be located anywhere around the world.

The New Brunswick Real Property Internet Information Service is a web based application that allows users to access three of its databases simultaneously. The user does not actually access the individual datasets as such, but instead a data warehouse that contains all the data from each of the individual datasets. The concepts in the New Brunswick Real Property Internet Information Service are similar to the concepts being investigated in this thesis in that it allows access to several datasets at once, however the difference is that the approach taken in this thesis is to keep the datasets separate.

All the policies and projects discussed in this chapter are in some way related to the topic being researched in this thesis. Whether they be policies that shape the direction of our spatial data future, or projects that achieve some part of the aims of this thesis, either way they are a good starting point for research in this area.

