

## **A HISTORY OF WALIS**

### **A synopsis of the origins and evolution of the Western Australian Land Information System**

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The idea for the WA Land Information System (WALIS) began in the late seventies. Since that time there have been many people involved in WALIS, some restructures and many different plans and strategies. What have we learned from this journey, thus far? Have we been successful?

In the mid-seventies there were problems with the management of land information in Western Australia. Tenure and cadastral information in particular was increasing rapidly and suffering from uncommonly arduous retrieval processes. There was a lack of inter-departmental communication, which encouraged duplication.

Aside from improving efficiency, there were said to be financial benefits in improving the management of land information. Foremost amongst those was the resolution of land tax anomalies. It was estimated in 1982 that if all land tax records were checked in a LIS, a revenue gain of between \$1.4 - 4.6 million per year would result.

The Western Australian Government Computing Policy Committee (WAGCPC) was established in late 1977, with Mr Bob Boylen, the deputy under treasurer, as chair. Despite a non-computing background, he showed great interest in the introduction of computing systems into government.

In 1978, WAGCPC commissioned a management study by PA Consultants to complete an analysis of requirements for a land information system to meet the needs of Western Australia. The report identified significant duplication and allocation of resources. It went on to say that: "current regulations, areas of responsibility and other restrictions to change will need to alter if the LIS is to be implemented successfully. Everyone must be willing to change".

The report recommended the development of sub-systems to manage each particular type of information. A common geographic reference system would then allow parcels of information from each sub-system to be related to unique geographical locations. In this concept, the data is the greatest influence on system development, not the functions which may be performed on that data.

On the basis of the study, Brian Humphries, an experienced LIS consultant, was engaged to provide strategic planning and coordination for the development of an LIS. Several committees were formed ensuring representation of all interested parties whilst promoting responsibility for system development within each separate department. Central to WALIS management was the Land Information System Advisory Committee, established as a forum to represent the interests of the public and private sector, as expressed by Special Interest Groups (SIG). SIGs were established to address specific issues such as urban and rural land use. The WALIS engine was LISSC (Land Information System Support Centre), the hub of technology and skilled personnel developing WALIS.

The initial emphasis was on transferring very large amounts of legal and graphic cadastral information into digital format. The aim was to integrate these systems to develop a property register for all crown and freehold land.

Two pilot projects were initiated by Special Interest Groups to investigate other capabilities of the system. Unfortunately, neither project showed LIS in a good light. The difficulties experienced highlighted that a commitment to WALIS for the collection and integration of corporate data carried a degree of risk.

With hindsight, the emphasis in the recommendations should have emphasised organisational solutions rather than technical ones. Furthermore, senior management should have been better engaged. These are commonly recurring themes in the WALIS story.

In March 1984, the Department of Computing and Information Technology (DOCIT) was created to replace the old Government Computing Division of Treasury which included LISSC. The structure of LISSC was revised to reflect its expanding and more demanding role.

The LISSC was growing into a service provider with a well-resourced technology base and a wide array of computing and consultancy services. It seemed quite clear that LISSC wanted either a system which had all the data integrated and ready for use, or a very strong influence in the way agencies managed and integrated their land information. As a consequence, WALIS was seen as a creature of LISSC not as a creature of the participating agencies.

Since the inception of WALIS in 1980, development strategies and requirements had been strongly influenced by the findings and recommendations of the PA Report. By 1986 the rapid growth of databases and sub-systems forced a re-evaluation of the goals and strategies of WALIS.

A decision was made to establish on-line access to data through workstations and terminals. It was also decided to overlay topographic data on cadastral data and to continue capture of prioritised data sets.

To help alleviate the responsibility of LISSC for these improvements, the concept of data custodians was promoted. Custodians could instigate data capture and dissemination, rather than wait for centralised management to co-ordinate the task.

It is not quite clear how the establishment of custodians was to resolve this issue, other than by devolving accountability. But without strong co-ordination, this devolution could easily lead to duplication. By their nature, custodians emphasise their own business needs in their data collection programs. They are unlikely to focus on government-wide efficiency improvements unless it is to their advantage to do so.

A Functional Review Committee Report, in early October 1986, recommended the formation of the Department of Land Administration (DOLA) from the Department of Lands and Surveys and the Office of Titles. LISSC was transferred to DOLA and divided into two halves, one to address cross-government co-ordination and the other to concentrate on issues internal to DOLA. In effect, DOLA was claiming custodianship of tenure and cadastral data, leaving LISSC without a data management role.

In late 1986, Intergraph Corp reviewed WALIS' computing facilities, and concluded that cadastral information management had been prioritised at the expense of utility and geographic information management, potentially alienating many WALIS agencies.

So, in 1987 the committees were rearranged. The WALIS Executive Policy Committee was retained. The WALIS Council replaced the former WALIS Executive Steering Committee. The WALIS Secretariat was formed to replace the LISSC.

By 1987, the role of the LISSC had gone far beyond the co-ordination role. It was a controller, and was seen as an enclave of technical and political power. This concentration of power was seen as untenable by many senior managers and was one of the major factors contributing to the changes.

The emphasis still remained on the technology. Very little had been done about restructuring the processes, operations or structures made possible through re-engineering based on the new technology. Most likely this was due to the membership of SIGs, project teams, committees and other working parties. They were almost exclusively technical officials, and they were trying to solve all issues with technology. Some issues clearly required re-engineering before technology was applied.

A new corporate plan emerged from the re-structured WALIS management. It was a landmark report because, for the first time, it considered all issues, managerial and technical that needed to be addressed. In particular, it addressed one of the more important WALIS issues: how to develop a system that both emphasised cross-government gains, and allowed agency-specific developments to go ahead.

The report noted that progress in the capture of legal and especially graphical cadastre -- the 'fundamental building blocks' of WALIS -- had been disappointingly slow. The specific problems hindering the development of WALIS were highlighted. Computer processing and storage capacities were 'hopelessly overloaded'. Another problem was that there was no Wide Area Network.

There is no evidence of a concise response by the WALIS Executive Policy Committee, apart from a successful submission to Cabinet for additional funding to upgrade WALIS computers. Government contributed \$243,000 and individual agencies contributed \$100,000.

So whilst it appeared that a lack of technical skills was one of WALIS's greatest impediments, the analysis pointed more towards deficiencies in the management structure and culture. Obviously the concept of decentralised management and responsibility was not working properly. A lack of planning and policy had allowed personal and departmental technological fears and prejudices to stifle LIS/GIS development. The Executive Policy Committee and the WALIS Council had been unable to provide enough direction and decisions. Policies were not being effectively communicated to relevant organisations.

The need to instigate a comprehensive marketing strategy was brought into sharp focus when IBM approached the WA state government with a joint-venture proposal for the marketing of WA government land information. With no clear, government-wide marketing guidelines and policies, there was a growing potential for the inappropriate release of government data.

Consequently, in October 1988 Executive Policy Committee formed a WALIS Marketing Taskforce to develop policy for the marketing of state government information and to determine whether the marketing should involve the private sector. Coopers & Lybrand WD Scott (C & LWDS) were contracted to survey and interpret the marketability and market value of land information in WA by the end of 1988.

The report was the first to move the focus away from government data custodians and onto the needs of the private sector. It urged the development of an integrated, on-line LIS, with access from either an individual government department, or from a centralised agency. The report suggested that land information should be marketed to relevant user groups, using product packages, to maximise the value of the data.

But the organisational and technical difficulties in providing on-line access were consistently under-estimated. Few people appreciated either the scale of the communications infrastructure or the systems development needed, or the data

management regimes required. The technology available in the mid-eighties was simply not capable of providing the service.

Furthermore, with the departmental emphasis in WALIS, there was no one to take up the challenge of developing a government-wide business case for on-line access. The consequence of this was that on-line access remained a nice idea with very little chance of implementation.

The WALIS Marketing Taskforce integrated the C&LWDS survey into their own marketing study. Some recommendations were made. For instance, the taskforce argued that government should take an active role in information marketing. It should establish a co-ordinating body to market information. This marketing body should be a statutory authority, responsible to the Minister for Public Sector Management.

The report also suggested the government should recognise information as property, and assign ownership to all information sets. Government information should only be released according to the terms and conditions defined in an official government licensing agreement.

A cabinet submission was planned but the exercise lapsed. As with the 1987 Strategic Development Plan, few of the recommendations were actively developed and implemented.

The report, and the responses to it, repeats the pattern of considering technological solutions alone, without considering organisational or procedural solutions as well. To establish a comprehensive business case for any government-wide WALIS initiative required senior management and technologists alike to think beyond the agency horizons for which they were accountable.

The WALIS Secretariat was the only group that could build this business case. This however depended to a large degree on the support of agencies to provide the necessary information. But agencies had their own priorities and the support for such business cases was difficult to build.

With hindsight, the WALIS Secretariat would have been better advised to work more closely with agency senior management on building business cases, rather than working with agency officers with LIS experience.

This inability to engage senior management in the debates was telling. With their broader view of issues, senior managers could have placed different perspectives on various issues if the potential advantages could have been put in terms of a business case, rather than in terms of a technology installation or upgrade.

Even the restructure of WALIS management in 1986-87 was unable to change the focus from departmental sub-systems to a more corporate approach. Studies such as the Strategic Development Plan, and the WALIS Marketing Taskforce Report, which went to the heart of the integration problem received little distribution or public acknowledgment. Few of the recommendations made on system integration were adopted.

Late in 1989, the Public Service Commission was asked to nominate a new chair for Executive Policy Committee. In assessing the situation, the above concerns were brought to light. Consequently a cabinet submission was prepared to integrate and improve access to the state's land information. An Integrated Land Information Program (ILIP) Taskforce was established.

In June 1990, cabinet approved a number of recommendations including the elevation of WALIS to full program status within DOLA. A second recommendation was to make the Minister for Lands the accountable minister.

In the 1990/91 budget an additional \$500,000 was allocated to accelerate data capture and improve communications between agencies.

The aim of the ILIP program was to integrate the system rather than the information, with a series of distributed agency systems housing data, accessed through an efficient communication network.

Several improvements were slowly developed and implemented in the period between 1990 and 1994. Agencies formally accepted custodianship for nearly 100 datasets and established capture and maintenance programs for many of them. As a consequence an annual State Land Information Capture Program was developed. The Program detailed agency capture programs and determined areas of high 'whole of government' need. A comprehensive custodianship policy was developed in 1994. A Land Information Directory -- an on-line graphical service providing metadata on WALIS data -- was developed.

Cabinet also approved data marketing and pricing policies for WALIS data in 1993.

The WALIS Strategic Plan 1994-1996 was an important initiative, as it publicly defined WALIS philosophy, strategies and plans, both long and short term. Developed through lengthy consultation with public and private sector agencies, it was endorsed by the Minister for Lands, and released in October 1994. It showed that WALIS had developed to the point where access to relevant, reliable, current and comprehensive land information was the paramount concern, rather than the development of the numerous systems that comprised WALIS.

In November 1994 the WALIS Advisory Committee met for the first time. This committee was formed to provide strategic advice to the WALIS Executive Policy Committee on land information management from a community perspective.

The WALIS Land Information Directory was made available on the Internet in early 1995. The WALIS Website also included a copy of WALIS policies and standards. In mid-1997 access to the Land Information Directory was made even more equitable, with the development of the Interragator CD-Rom. Interragator supported interactive spatial searching as well as text searches.

The convenience and benefit of having a clearly defined strategic plan was recognised with the publication of WALIS Strategic Directions in September 1996. Whilst the previous Strategic Plan had focussed on providing access to information, one of the main objectives of the 1996-1997 Strategic Plan was to ensure that the WALIS resource was optimised to realise its potential. To do this, a spatial data infrastructure was proposed to allow accurate, complete land information to be readily located and integrated. Spatial standards and fundamental datasets were vital to the development such a system.

The Strategic Plan recommended that datasets such as cadastre, road centreline, street address and geodetic control network be emphasised. The plan anticipated that interfaces between systems would be developed between various agency systems only where the need could be justified. This is a change from the previous attempts to develop on-line access.

Some industry comment on the fundamental concepts of data storage and data access in WALIS encouraged a more comprehensive access strategy to be

developed. Access to corporate data on the WALIS server is still limited to the larger government agencies. There is still a need to provide improved services to those agencies that do not have a strong LIS/GIS capability but nonetheless still want to use land information in their operations. A web-interface is being developed by WALIS to allow more effective access to the WALIS Clearing House of strategic corporate data sets. The eventual aim is a virtual data clearing house, with links to other national land information sites/servers.

The introduction of Net Appropriation, application of National Competition Policy regulations and 'end-to-end' process management in WALIS agencies is resulting in increased responsibilities for agencies in the coordination, supply and marketing of land information. New guidelines for the conduct of WALIS in the late 1990's have been developed, with the emphasis being on flexibility, and determining the most appropriate business approach for the vendor and purchaser

In an effort to ensure all WALIS Community members are represented, the WALIS Council had swollen to 28 members from an original 13 in 1987. A recent review recommended the reduction of WALIS Council to a core of thirteen. Each councillor will now need to represent all of WALIS rather than a single agency. The WALIS Office with the support of Council will need to build and sustain strong links with those agencies not represented on Council. Regular briefing and feedback sessions with all WALIS participants will be an essential feature of this.

So, how successful has WALIS been? If the only yardstick for success is on-line access, then no, we haven't been successful. On-line access requires sophisticated technical and managerial systems both at the custodian agency and the user agency. Whether it can be achieved, at a suitable price, is problematical.

The other deficiency has been in achieving the cross-government improvements in efficiencies promised when WALIS started. Few of these efficiencies have materialised. More effort is required here and senior management must be engaged in the debate.

On the other hand, there have been many successful LIS developments in WALIS agencies that are the equal of any in the world. A number of improvements to interagency information flow have been implemented. WALIS has been successful in resolving many data management issues that will underpin future access mechanisms. For instance, custodianship, pricing, marketing, metadata and data licensing. We have identified a number of others that we are turning our attention to and no doubt there will be other ones we haven't yet identified.

Today, the land management community's interest and participation in WALIS is strong. 450 interested professionals attended the last WALIS Forum, twenty five State Government agencies perceive value in being members of WALIS and the voices of local government and industry are being heard. If communication and participation are the building blocks of success, then WALIS is well positioned for the new millenium.