‘GEOGRAPHICAL DATA SHARING – ADVANTAGES OF WEB BASED TECHNOLOGY TO LOCAL GOVERNMENT.’

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ABSTRACT

Web based GIS is a way to introduce e-delivery into the operation of Local Government via geographical data sharing within the organization and with the outside world. The UK’s Government has promoted e-government to encourage local authorities to make all their systems and services electronic and integrated. Geography is often the only ‘glue’ that can integrate the data residing in different local authority departments. Web based GIS is the first step in e-government as it ensures that all departments within a local authority share essential information. Geography is the easiest way to improve the internal and external communication and to join up the work of departments and offer better information to the public.

An Intranet based GIS (back office system) promotes the building of better relationships among employees and departments within the local authority. Data sharing within the community assists the management of the city. Departments share each others data, therefore the concept of joined-up government and services becomes a reality. Centralised data storage helps centralised management and access to data for officials working at remote locations and in external departments. Services become ‘joined up;’ all systems and services become integrated and the data is viewed in the context of an entire organisation rather than in isolation. Furthermore, decision making is improved via better planning and money is saved or invested in a more efficient way.

Web based GIS (front office system) allows building positive relations between the authority and individual citizens, businesses, investors and tourists via sharing essential information in an intuitive and understandable way. GIS embedded into the authorities’ web page delivers ‘e’ services to citizens so that they have instant access to services provided by authority. Web based GIS adds value to authorities existing web pages while online service delivery represents financial savings for government as well as fostering increases in social inclusion. Moreover, web based GIS forms can assist in forming links with business community and provides information for visitors and tourists.

KEYWORDS: Geographical data sharing, e-Government, web based GIS technology, joined-up services, open standards

INTRODUCTION

E-government promotes the deployment of new technology for the better operation of Local Authorities. Web based GIS helps to meet the requirements of e-Government via geographical data sharing within the organization and with the outside world. With web based GIS Local Authorities may enhance their operations by improving efficiency within the organization and building positive relations with its citizens or visitors. Geography integrates or ‘joins up’ the work of departments. It also improves communication with the public, who understand maps when they do not necessarily understand department structures or jargon. It is the easiest way to improve the internal and external communication.

1. INTRANET GIS TO IMPROVE INTERNAL COMMUNICATION AND BUILD RELATIONSHIPS WITHIN A LOCAL AUTHORITY

A Local Authority encompasses numerous internal groups, departments and individuals (agencies, departments, non-profit organizations, etc.) which need to cooperate, exchange information and are interdependent. An Intranet GIS allows sharing of data throughout the local government departments, which strengthens the relations among the officers working in different departments within the organization.
departments. The London Borough of Ealing delivers joined up services via the sharing of geographic data across the entire local authority where Web based GIS technology implemented by GDC helps achieve immense advantages.

a) Departments share each others data
Web based GIS joins up the services via the sharing of data across the borders of the departments. Geographic information is often the only common ‘glue’ which can connect information residing in different departmental systems and make joined-up services a reality.

The concept of joint working and ‘joined up’ services

![Figure 1: Geography as a ‘glue’ – joining up the services within Local Government](image)

Darren Bestley, head of eGIS for Ealing: “today we have some 130 GIS licences reflecting the enthusiasm that many departments have for using GIS and the fact that a very large percentage of the information we all work with is location-based. However like every other local authority, most departments worked in isolation and very little information sharing took place, even though this could have helped to improve services. To tackle this, we wanted to make the concept of joined-up government and services a reality.”

b) Centralised data storage and management
The main problem that Ealing identified was that no central point existed for the maintenance and storage of geographic information. As often happens, each department had its own set of data in various versions and copies and little exchange of data and information between the departments took place. An immediate investment was made in a dedicated server and the centralisation of historical and current maps as well as aerial photos and all Ordnance Survey base mapping data began. Ealing realised that an Intranet-based GIS application would not only present a cost-effective solution but also allow, for the first time, true sharing of data. The centralised data storage helps centralised management and access to data for officials working in remote and independent departments.

c) Services are ‘joined up’
The joined-up concept emanates from the UK Government’s decision to promote e-government as the standard for all local authorities in the UK by 2005. The idea is to encourage local authorities to make all their systems and services electronic and integrated, allowing citizens to access information more easily. Joined-up is the first step in e-government as it ensures that all departments within a local authority share essential information, helping to cut duplication and
ensuring that they act as a cohesive unit to deliver improved services. Intranet-based GIS allows joining-up the departments upon the geographically based information.

**Geographical Data Sharing via intranet based GIS**

![Geographical Data Sharing between the Departments within Local Government](image)

**d) The data is viewed in the context of an entire organisation rather than in isolation**

The new Intranet GIS in Ealing went live in July 2001 and the results have been felt by the entire organisation. Data can now be viewed in a variety of different formats such as planning application maps, aerial photography, street and service maps. Different departments can now see how their services fit with others and act as a cohesive unit for other departments. Therefore, a new level of planning can now take place.

**e) Decision making is improved**

Decision making has been improved in Ealing, because the officials have instant access to other departments’ data. They can therefore see how their decisions are influenced by information residing in other departments. The education department can better plan safer school routes by referring to accident black spot maps. Elsewhere, an instant guide is provided on where pruning of the trees may need to take place to improve camera visibility in Ealing. This is achieved by combining the map of roadside trees with a map of the parking department’s location of CCTV cameras (security cameras).

A quicker decision process regarding the allocation of resources for various activities has been another benefit of the intranet based GIS system in Ealing. Using an in-built search engine and the layering function of intranet GIS, the employees can get detailed visual representations of the various needs of Ealing. They can then accurately match that with available resources, ensuring a better service for all the constituents.

**f) Money is saved or invested in a better way**

Introducing the intranet based GIS allows better standards for the customer service because council officers have access to information from other departments. Therefore they can make better decisions and better inform the citizens. The officials do not have to send the citizens to numerous departments for more information in the same area – all the necessary information may be accessed from one computer. The citizen, interested in all the information about a particular location, can find out everything he needs from one source.

If Geographic Information is to be made available to a wide range of users an intuitive client interface is required. It should be possible to tailor the functionality to different users’ needs, both within and external to the Authority. GDC have found that many of those with full desktop GIS
licences are barely scratching the service in terms of functionality. Most users just require the ability to view information, conduct simple spatial analysis and produce printed maps.

An Administration Module has been introduced, where the functionality can be tailored to the needs and knowledge of the individual user. A centralized administration console allows full control over the way different users interact with the intranet-based GIS. Each user logs in and receives the required functionality and no more than they need. Therefore, the users do not get discouraged once they open the GIS tool for the first time and are not overwhelmed with too much functionality.

**g) Both the local authority staff and the citizens benefit**

The citizens benefits from better operation of the local government. In Ealing, the combination of their own data with crime statistics from the local police forces has enabled to create hot spot maps showing where crimes were most likely to occur. Armed with this information Ealing can identify areas for new lighting and CCTV cameras.

30% of Dorset’s heathland is located in and around the urban areas of south east Dorset in close proximity to nearly half a million people. These locations are frequented on a regular basis by local residents as well as visitors to this popular area of the South Coast much of which has recently been designated a ‘World Heritage Site.’ Dorset County Council has always been aware of the importance of its landscape, particularly after the series of fires of 1976 which decimated much of its heathland. A determination to protect this valuable cultural landscape led to the creation of the Heathland Forum and a subsequent successful approach to the European Union’s Life Nature Fund, resulting in an award of £1.2 million over a five year period.

Intranet GIS currently has over 500 users across the Authority and its Partners. In terms of local authority users, all are now able to view and utilize the same GI data despite having several systems in operation as the Intranet GIS open standards approach unifies all information.

Even more significant are the benefits afforded to the environment and therefore to the citizens of Dorset. The combination of a coordinated approach, education and technology has led to a 52% reduction in the incidence of heathland fires. Thanks to intranet GIS, local authorities share vital data across the entire Dorset Heathland Partnership. Wardens are now able to monitor damaging activity and predict and prepare for further damage. The Dorset Fire and Rescue Service can now access vital, up to the minute data such as access routes, rendezvous points, fire hydrants and out of bounds areas enabling them to plan for, respond to and fight heathland fires. The increased reliability of the data accrued has also meant that Dorset Police’s crime analysis teams have had greater success in detecting offenders, leading to a number of successful prosecutions.

**2. WEB BASED GIS TO IMPROVE EXTERNAL COMMUNICATION AND BUILD RELATIONSHIPS WITH CITIZENS**

Via web based GIS the local government (e.g. [http://derbyshireregion.maps.derbyshire.gov.uk](http://derbyshireregion.maps.derbyshire.gov.uk)) can build improved relationship with the outside world, i.e. the citizens, investors, businesses and tourists.

In big cities, where several local authorities deliver services in close neighborhood, like in Warsaw, it is difficult for the citizens to understand and find relevant information from several web pages. Therefore, combining the spatial information on a common web page, delivers relevant information for the citizens and tourists, who do not know, or care, where the boundaries between the local communities are. They only wish to easily find the information they need.

Web based GIS solutions make the communication with the public easier, through intuitive navigation on maps. The London Central Partnership, for example (comprising the London Borough of Camden, Islington, the Royal Borough of Kensington & Chelsea, Westminster City...
Council and the Corporation of London), delivered a pilot in 2003 which aimed to combine geographical information from the five Boroughs and deliver it to citizens regardless of which authority provided a particular service, through common public interface.

**a) Deliver ‘e’ services to citizens**

Web based GIS is a means of giving the citizens the ability to communicate with the Local Government via the internet. This is one of the most obvious benefits of e-Government to the citizen. The communication with the authority, as well as delivering of services to the citizens is achieved irrespective of the boundaries between the local government areas. Therefore, the citizens may find the information they need no matter which authority delivers the service.

**Finding the schools and other services in close proximity to home**

![Figure 4: Service delivery irrespective of Local Authority boundaries](image)

Web based GIS allows problem reporting (like blocked drains, neighbour noise or traffic light failure) with one click of the mouse on the map. Detailed information is then sent to the respective official who can deal with the problem. This improves the experience the citizen has with the authority and therefore the level of satisfaction. It also saves time and money, since the citizens do not have to phone the authority in order to report problems. Moreover, the rate of reporting is improved as the citizens, who did not know who was responsible for the area where they spotted the problem was still able to report the problem.
Reporting problems to Wardens with clicking on the specific location

![Problem Reporting Tool](image)

**Figure 5: Problem Reporting Tool**

b) **Add value to authorities existing web pages / services**

The citizens’ satisfaction and therefore loyalty can be improved if more value is added to the services offered. Web based GIS solutions add enormous additional value to the local governments’ services. Imagine a local authority producing a glossy brochure and distributing it in a poor area. Citizens could be enraged if they saw ‘their money’ being spent that way. Quite conversely, internet users are often a well educated and affluent group. They will be satisfied in seeing web based GIS solutions (like the map integrated with local planning application on the web page), naturally accepting the way their money is spent.

*Web based GIS to deliver information in an integrated form*
Figure 6: GIS embedded into web page integrates the displayed data

c) 24/7/365 access to service provided by authority

Web based GIS enables the authority to communicate with the public 24 hours a day, seven days a week. For example road repair and construction. The interactive, on-line maps show up-to-date locations of an ongoing and planned road projects. The list and map can be automatically updated by the city staff. Therefore, the travellers may pick alternative routes, avoiding stress, delays, annoyance and pollution. With the implementation of web based GIS the Local Government ensures that the citizens will not find out about the unexpected road congestion after the fact – after they are stuck in traffic jam. The citizens get the updated information 24/7/365.

Updated online information about traffic jams and expected delays

Figure 7: Web based GIS to inform the citizens
d) **Online service delivery represents financial savings for government**

Online access to important information increases contact with the community and is a proven means to reduce costs of operation of the Local Authority. For example the officials who deal with citizens enquiries, can be focused on other crucial activities. Therefore, online access to information assists a better allocation of resources across the authority.

e) **Increase social inclusion**

In case of web based GIS the time spent on finding the location of the nearest Library, School or Sports Facility (irrespective of the local authority boundaries) is drastically reduced. Additionally, it is a new channel of communicating with citizens, who can report e.g. abandoned cars or litter by pinpointing it on the map. ‘The customer-perceived sacrifices’ are limited because the citizens avoid spending time in the queues or calling the officers, trying to find the right person to report the problems to. Web based technology helps citizens to become more involved with their community. The use of multi language deployments of web based technology ensures all citizens can benefit from the same services.

f) **Form links with business community**

By forming links with local business the local authority can deliver additional information to its citizens. Information about services delivered by local businesses can be provided to the citizen in the same interface as used by the authority. Web based GIS allows the investors who might consider investing in the area to see the site from their office abroad. The investors may be able to see the nearest parks, banks, restaurants, etc. depending on the nature of investment. Therefore, the local authority increases the value of information available to investors, which can speed up decision processes.

g) **Provide information for visitors and tourists**

Competition for international tourists can be achieved via the web. This makes the web based GIS a natural choice. Tourists may search on local government web pages for the places of special interest to them, fulfilling certain conditions (close to a hotel, park or beach). They can see them on the map, with all the Point of Interest (POI) being shown at the same time (ATMs, swimming pools, parking, etc.). They can search through the community address database and print out the map window together with the information on the object and the way to the nearest POI. This gives the tourists the map to be taken with them.

h) **AGI Award**

The Judges of the Association for Geographic Information Local Government Award 2003 recommended the London CABI (central information from A to B) project as the winner. ‘The project provides an innovative solution for joining up geographic information to provide a seamless locator for services to the public. The CABI service enables citizens to find their nearest council facility irrespective of which Borough provides it. The solution is platform independent (various different GIS are used by the partner organisations), as geographic information from 5 local authorities are joined together in a web GIS using GML. The project demonstrates that the use of interoperability data standards (specifically OGC) can join up data into a seamless service as requested by the e-service delivery agenda. The project gives an example for good cross-organisational and public private sector partnerships. Aside from the 5 local authorities that contribute the data, GDC offered this unique technical solution by partnering with private sector companies.’

**Summary**

Web based GIS allows building positive relations between the authority and individual citizens, businesses, investors and tourists. GIS embedded into the authorities’ web page promotes building positive relations with the public via sharing the data in the form of an easily navigated map displaying data relevant to the user. Therefore, the Local Government can inform the public and conduct an on-going campaign to promote its region as a great place to live, visit and invest.
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