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Implementing and Enterprise Level GIS System

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Introduction

In March 2000 Scottish Enterprise (Scotland's economic development agency) launched a project called Kmap. The aim of the project was to increase the organisations use of geographic data through greater use of Internet technologies and greater sharing of data between organisations. The first year of the project was mostly spent trying to facilitate the sharing of data between government agencies, local authorities and similar bodies. Although the concept of data sharing has been widely accepted, the actual logistics of implementing this proved considerable. As the project evolved, a greater emphasis was placed on delivery of more diverse range of geographic services to the staff base.

One of the key drivers towards the creation of more geographic services was the introduction of the Business Transformation process at Scottish Enterprise. This process was implemented to increase the sharing of information and more importantly to increase the access to this information. A large amount of this is facilitated through Internet technologies. In most organisations the majority of data held has a spatial element to it. This is often just an address or postcode but is still easily mapped. In a corporate environment the sharing of this information becomes increasingly important and the need to build comparisons between this information is again important. As modern GIS technologies have developed embedding this within the corporate environment has become easier to facilitate. The paper will continue to discuss some of the technical choices organisations will have to make and the issues that may exist in joining with mainstream corporate IT policies.

Discussion

Before we start to get into the technical details of corporate or enterprise level GIS solutions, we need to look at exactly what these terms mean. There are many online GIS dictionaries as well as text books giving definitions of GI terminology, but looking into this paper most don't recognise corporate and those that do give fairly woolly explanations. Because of this, many vendors prefer to it in slightly different contexts. For the purpose of this paper, corporate or an enterprise level solution is being referred in the following context "a system that serves a large user base, who need to interact with the system on several different levels". The Kmap project has 4 different user levels. The first is highly functional intranet map users, the second being lower functionality map viewers, again based on Internet technologies. The third customer base is people who want to retrieve geographic query based information without the need for maps. The final user base is a group of expert GIS users who need access to the same data, with the flexibility of traditional GIS desktop packages such as ArcView or MapInfo. Here we see how we have several highly different user groups, however they all need access to the same underlying data. Each delivery channel must always output some data, it might be presented differently or have greater detail but an unemployment rate should not change if a different delivery channel is used to access the same information.

Various GIS vendors have in recent years marketed themselves as fulfilling this agenda. Each of these vendors' claims is true to an extent, however, it should be remembered that each of these systems have

their own strengths and weaknesses. When implementing a corporate GIS generally the systems that run on an RDMBS such as SQL, Oracle, or similar are best as they offer the greater level of flexibility. Traditional file structure based GIS's tend not to be suited when being accessed by several different users each with different access permissions.

As mentioned above each piece of software has its strengths and weaknesses. If you are implementing a system with several different user groups and hence versions of the same data, you may infact need to use 3 separate pieces of software. Generally if these are from the same vendor this is easy enough. However, the strength of some software could lead you to use a mixture of vendors and software.

When selecting the software components that you need to implement your solution it is important to remember what the actual business requirements are. If you do not have them, they must firmly be established before selecting software. At Scottish Enterprise we had well defined services that were required and hence were able to select the most appropriate software. In our case we selected a mixture of ESRI and Auto Desk products. There are also a few users using MapInfo. Our main spatial data holding uses SQL server and ESRI's SDE product. Interaction with of he software such as Autodesk and MapInfo products is based on live translations of our main SDE data holdings. In addition a database was built to control the interaction between delivery channels.

One of the key drivers behind the shift to a more corporate GI Solution was a general organisational shift to share data more effectively. This corporate shift in IT policy enabled us to piggy back on several IT upgrades that would enable us to have greater reliability on our final systems. It also took care of most of the security and access requirements for the site. The main benefit came from the creation of a highly robust service that meant we could offer all our users a full 24/7 service. These are all very major benefits however there have also been sever drawbacks. To fit with the central IT infrastructure we had to re-engineer our software model to encompass the need for switching between servers. Also being part of a 24/7 service has meant that we have had to double our IT infrastructure so we always have a live spare ready incase there are problems with the live service. Having said there are disadvantages, the strength of being imbedded as part of a "one stop" information system means people access our services often without realising it.

Having greater access to this information is also starting to bring a new set of organisational issues to the foreground. Now users expect to easily access their information on a map, but all too frequently the quality of their data needs further costly work. A shift in organisational culture is needed to force people to start thinking of mapping requirements at the start of a project, not at the end.

We have successfully implemented a corporate GIS across a large organisation and although it is a success it could have been easier. Most vendors in the market place insist on using their own storage mechanisms, which means for it to be read by an alternative software package it normally needs to be translated to a different format. This then requires creation of GML (Geographic Markup Language) and the OS's bold move toward this for their Mastermap product this could well be a possible future solution. If all vendors fully embraced this common standard, multi vendor solutions would be much easier to implement. On the other hand this could open the market up more and perhaps this is why the vendors are only slowly up taking this standard and not to its full potential.

Conclusions

A corporate GIS has many users often of different abilities and also with different requirements, because of this you will often have several different software requirements. When selecting software you must always select it based on the business requirements and you will often need to use more than one vendor. This will probably lead to incompatibility issues that can normally be worked around with data translation tools and customised solutions. Integrating with a corporate IT infrastructure has many advantages often associated with greater access to corporate data holdings such as CRM systems and similar, however, there are several downsides as well such as increased bureaucracy and standards that could otherwise be

avoided. With a shift to corporate GIS systems there is also a need for organisational culture change to ensure that geographic information is included at the start of the project rather than an afterthought.

References

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