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Exploiting buried treasure

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1 Introduction

This paper will examine the background and evolution to the growing importance of Graphical Information (GI) to the *Telecommunications* sector in the last few years and how this now plays a vital role in the ability of companies to have competitive edge, provide shareholder value and meet regulatory/legal requirements. I will use the experience seen through the eyes of the company for whom I work to illustrate this, but it is also important to understand the process whereby such information is derived and managed.

2 Background

Until the early 1980s, there was no choice for telecommunications services in the UK when the Conservative Government of the time privatised the monopolistic supplier and introduced competition into this market sector as part of the drive to modernise industry. The fledgling competition did not make an immediate impression and it has taken a significant period of regulation to help arrive at today's comparatively high tech, low cost market situation. However, growing competition has driven this at much greater pace recently. Minimal regulation now operates, as competition drives all participants in the sector to provide the most cost effective service possible, due to the sheer number of suppliers and the cut throat nature of the business.

In the dark ages of telecommunications monopoly, there was never seen to be a need to create and maintain accurate geographical information on the location of external plant and other assets. Paper records and local knowledge (quite often retained in an individual's head) were deemed to be good enough as there were no financial penalties for inefficient service which was a characteristic of utilities at that time. A lack of clear records on location and capability hampered the whole operation, with typically new capacity being added that was not required. This would explain why you would often see a number of supplier vans gathered around the same location trying to work out what the job requirement actually was, could it be done from the limited information provided and who had which bit of the jigsaw to complete the work. If the customer actually got *what* they wanted, *when* they wanted it, this was sometimes pure co-incidence!

With the advent of liberalisation and accountability, there was a move towards better cost control and exploitation of assets, but paper based record systems continued to be used which has compounded the problem of inaccurate data as time has gone on. The perceived explosion of Broadband and Internet based services finally forced companies to re-examine their whole strategy of data management and the processes around how this is used. They suddenly woke up to the fact that the data they held within their grasp could open up new revenue streams and provide a competitive advantage. Geographical (i.e. location) information particularly, could not only tell companies where existing capability could be exploited to meet new products and services, but point out where investment was required to create market opportunity. The question was how to exploit this wealth of information!

3 Current Situation

The first requirement must be to look at the creation and management of such data. The ideal would be a single data repository where geographical and associated information required to provide/maintain service

could be obtained and updated as work is carried out. However this requires very slick and cost effective processes which are difficult to implement in large organisations where different functional area have different requirements. There are many solutions around to suit companies of varying sizes and needs, but it is not only systems and processes that need to be modernised. The need to treat location information as an asset must be embedded into the culture of an organisation if it is to be successful

Within the last few years, my company has spent a great deal of time and money trying to determine the best Graphical Information System (GIS) to manage its vast asset base and unlock the vast potential of the network. The need was to not only survive, but prosper in the climate where regulation and competition have eroded market share. There have been several false starts on an overall strategy with many ad-hoc systems (e.g. CAD) springing up – hence duplication and confusion!

Until approximately 3 years ago the company considered the best way forward would be to create electronic geographical information from its paper records, redefine the data model around the plant hierarchy and vectorise (i.e. add intelligence) all the data as it was input to the database. The pilot of this proved too costly and time consuming and was hampered by the politics of managing several suppliers. This big-bang strategy was scrapped.

Following re-appraisal, a more simplistic approach was agreed whereby working with a single supplier, a GIS database has been created based on raster data where paper records have been scanned in. This continues to have its limitations as the records have been scanned into various “worlds” of plant on map, duct and cable in the format that the old paper records were held. It has however opened up many cost saving and revenue generation possibilities as this information is now held electronically.

4 Exploitation using Limited Capability:

a) Reduced Records Upkeep Overhead

This information is now far more accessible and easier to maintain by dedicated records personnel whose role is to ensure information is up to date and conforms to common standards. Although still regionally based with paper still part of the process, there has been a significant reduction in the resource required to look after geographical records. In turn the location information gradually becomes updated and provides an even more valuable asset, for example reducing the number of jobs that have to be re-planned because data provided in the first instant is incorrect.

b) Meeting Legal Requirements

Information is required by Local Authorities and other Utilities regarding the location of plant where work is to be carried out in the public highway. There is a legal obligation to provide this when requested and in the past everything was done by post or fax. A facility has now been created whereby authorised users can access the GIS database via the company web site and request a print of a particular area which will be transmitted by e-mail to the originator. Again this has enabled a significant reduction in resource to undertake this type of work with all management of the process carried out from *one* location. Other benefits of this are the ability to provide location information quicker, which may be more up to date than if something is sent through the post, particularly in a high churn area. This could reduce the risk of damaged plant resulting from mis-information on location or plant type.

Another benefit from having a central GIS repository is the ability to meet Health and Safety requirements in terms of marking dangerous and hazardous locations in the network where the company’s own personnel or contract staff may work, e.g. manholes prone to gas build-up.

This is an example of working with an innovative supplier who has provided functionality to meet business requirements because they fully understand the customer needs.

c) Data at the Touch of a Button

Location information is now available online via the Company Intranet and this has had immediate benefits in terms of reducing requests to the records office for prints and facilitating more effective planning by the ability to carry out surveys from the desk instead of visiting the site. This has also provided the capability to provide accurate location information quicker to contractors with prints direct from the system instead of local paper copies as part of the job pack.

d) Ability to get to Market Quickly

With competition so intense, any facility to get one step ahead of the opposition is a vital weapon in any company's armoury. Local authorities and developers will supply information on Greenfield sites for housing and industry. Functionality has been designed to immediately process these site plans in terms of the make up of the site and likely customer profile. Optimised network design then occurs to best fit each location. The network requirements are then not only passed to contractors to commence build, but to the marketers to enable them to plan campaigns to attract new custom (or retain existing custom which is as equally important) from that location. An example of this is where deals have been struck with executive homebuilders to install two or even three lines prior to customer occupation in anticipation of home working. A system is also under development where the process of "plot call-off", i.e. activating service when residency of a new property takes place is being automated based on location data already being created – this includes the ability to do this via mobile phone.

e) Marketing Specific Products and Services

The capability to provide new high bandwidth products and services is sensitive to the quality and type of network technology, but is also subject to transmission loss from the exchange. An example of this is ADSL which can provide 2Mbit capability down a copper line, but where the premises being provided has to be within less than one kilometre of the serving exchange. Such information can be provided to the Front Office so that the customer service requests can be answered on first contact. This is not always the case at the moment due to the unreliable nature of some of the relevant data. This is where location information is so valuable, in that a decision can be taken to market products or services where capability already exists, i.e. maximising existing assets. The alternative is to build and market new capability to match forecasts where this does not already exist.

f) Empowering Our People

One very successful initiative has been the provision of GIS information to the field engineering workforce who are organisationally based around approximately 80 Customer Service Areas (CSA). The application itself was developed in conjunction with a leading business intelligence solutions provider and demonstrates the power of close collaboration. Each CSA database averages 3Gbits of data, which is provided on the engineer's laptop computer. This gives users access to detailed maps of ducts and cables supplying all types of customers as well as premise location. It enables engineers to locate a property, and then progressively zoom in to view road networks and local plant/network details, underground ducts and finally cables within these ducts. This solution also allows engineers to type in an address or postcode to locate the customer on a detailed map as well as delivering the quickest route to the customer or network fault. This has provided significant productivity benefits by reducing the amount of time locating customer premises and pinpointing faults. This has been a major step in the removal of reliance on paper based records and all their inaccuracies which often resulted in losing valuable time responding to the customer and which has a long term effect on the ability to remain competitive.

Another feature of the application is to be able to annotate the application with new or amended plant information and return electronically for database updates. Network build or corrections can then therefore be relayed back to Records Management for immediate update.

5 Future Imperatives

All the above initiatives have enabled the company to keep pace with market changes, but it now needs to move up a gear to gain competitive advantage in the provision of data rich services. This will be achieved by various initiatives that are either underway or planned – some examples are outlined below.

a) E-Business

A pilot is underway with a limited number of contractors (e.g. Fujitsu) where electronic job packs are being sent electronically for network build and maintenance to be carried out. When work is complete the job is returned electronically for checking and payment to be made. The next stage of this is to enable the records systems to be updated online when contractors return the completed job details. The main benefits are the accuracy of the data being provided under this process (no paper to be mis-interpreted), speed of update of

records and probably the most important of all, the ability to utilise these new/improved assets as they are created.

b) Creation of Intelligent Objects

The current GIS system contains in the main dumb data, i.e. these are images with NO attribute information known as Raster. In order to further exploit this data, it is imperative that intelligence can be added to these objects to provide more information on location, capability and performance of network components. An example of this would be to vectorise all Distribution Points (DP's) in the database, which would provide information on the number and status of copper pairs with connectivity. This would also allow quicker access to information via the ability to go direct to that object in the database.

c) Public and Private Sector Collaboration

Several organisations have recently been involved in a project known as NJUG (National Joint Utilities Group) which consisted of several utility companies including Transco and NTL who came together to run a trial in sharing Geographical Information (Plant on Map location data) over the Internet for mutual benefit. Despite technology challenges, this concept has proved feasible and a recommendation has been made for this to go national deployment. This will eliminate paper based map records, consequential damage to plant and danger to operatives. Typically up to four or five utility companies may have records relating to an individual location in a built up area. Such a system could provide rapid response night or day without manual intervention.

d) Other Initiatives

Enhanced fault location capability and the ability to plot key network nodes using algorithms are being investigated.

6 Conclusion

The importance of *accurate* geographic data to organisations in this sector cannot be under estimated. In essence, it is the difference between success and failure in this highly competitive market sector where the edges blur day by day as IT, broadcast and telecommunications combine forces.

Some *key success criteria* are:

- Accessibility
- Collaboration
- Standards
- Electronically

Some *benefits* to be derived are:

- Access to market
- Asset utilisation
- Improved productivity

These are some of the ingredients to turn **Copper** into **GOLD**.