

## GEOGRAPHICAL INFORMATION SYSTEMS

## Mapping the future of our development

By Dave Boland

One of the most remarkable feats of rhetoric ever committed to speech, Winston Churchill once stated that "business carried on as usual during alterations to the map of Europe". The fact that he was referring to the human catastrophe that was a world war rendered the understatement all the more effective, but there was a certain truth to what he said – the map was indeed being altered, along with the lands that the cartography represented.

There is, of course, much information to be gathered from a map, and in these times of Google Earth and satellite imagery, we can now match real-time images with the lines and symbols that make up traditional mapping.

Geographical Information Systems (GIS) are now an integral part of a business planner's armoury, whether they are mapping demographics for potential customers, or sourcing the ideal point to site a new supermarket or housing development.

Maps can be incredibly broad or incredibly detailed, depending on the needs of the end user. They can tell builders where to build, and armies where to bomb. They can be actual or virtual, depending on whether a feature exists yet – or not. But what is undeniable



is that the ability to turn raw data into usable information has had a profound effect on the way business and life is conducted in modern society.

But, in a modern sense, the whole business of GIS started in 1824, and the establishment of Ordnance Survey Ireland (OSI). Originally designed to accurately measure the land

for valuation and taxation purposes, the Irish Ordnance Survey completed the world's first large-scale mapping of an entire country by 1842, some 22 years after Thomas Colby, of the British army, was first charged with the task (a more informative series of maps was subsequently completed by 1867).

While it is easy to be amazed by the information currently supplied by the likes of Google Earth, which allows people to zoom from a panoramic view of the planet into a decent view of their own back garden, the feats of the original OSI people should not be forgotten.

For example, to establish an

accurate 'baseline' for the entire survey, Colby developed a measuring system which incorporated two parallel bars of different types of metals.

Once the baseline was established, the surveyors used triangulation between mountain tops to create a framework of reference points for the entire country (some of the sides of the primary triangles were over 150 kilometres in length).

means of stage lighting.

The exhaustive process eventually gave us the basis of what we have today, an accurate and reliable guide to the country. Every road and track, every stone wall and hedge, and every river and stream was surveyed and mapped with a level of precision never seen before, and many of the

place names which we use today were originally coined during the process, usually by a process of Anglicisation of the Irish names.

Of course, such is the dynamic nature of natural and urban development that it was never going to be enough for OSI to simply map the country and pat itself on the back. The intervening years called for greater accuracy, and changes in population and urban development have necessitated the constant updating of the data.

And, while the tools have changed, the mission has remained essentially the same – an accurate representation of Ireland and all that it has in it (excluding subterranean mapping).

So, while in the beginning surveyors would have used theodolites (an instrument for measuring both horizontal and vertical angles), telescopic levels, measuring tapes and chains, they later moved to microwave electronic distance measurement equipment in 1960, infrared electronic distance measurement equipment in 1970, digital theodolites and total stations in 1980, and total stations with GPS and table PC devices in the field in 2000.

Satellite imaging is not used by OSI, which relies instead on aerial photography and, importantly, teams on the ground. So little has changed, except that accuracy and reliability is greater these days than in 1842 – although a comparison between modern maps and their 19th century counterparts will show just how accurate the pioneers of GIS really were.

## 1.8 million reasons to use GeoDirectory

A collaboration between Ordnance Survey Ireland and An Post has provided a database of directions, writes Dave Boland

There are just over 1.8 million buildings in Ireland. That means every business, every utility company, every service provider and every governmental body has to contend with up to 1.8 million addresses on a daily basis – with the obvious potential for delays that number entails. But Irish company GeoDirectory, which grew from the collaboration between Ordnance Survey Ireland (OSI) and An Post, has provided a solution in a comprehensive database which has catalogued every building and location in the country.

"We identified an infrastructural deficit," said Dara Keogh, general manager of GeoDirectory. "OSI had the mapping information, and An Post had all the addresses, but there was no link between a building's geographic location and its address. So we brought the information together, geocoded all the addresses with x and y coordinates, and gave each building its own unique fingerprint."

The ability to correctly locate an address has taken on even greater significance as a rising awareness of environ-

mental issues has brought logistics to the fore. Companies and state agencies can not only significantly reduce their carbon footprints, but can also lower fuel costs in an era of rising fuel prices.

This is why so many public and private companies which rely on deliveries have turned to GeoDirectory for a solution to their logistical issues. GeoDirectory not only provides the exact location of an address, it also provides information on the function, type and status of the building – whether it is residential, commercial or

industrial; whether it is detached, semi-detached, duplex; and whether it is occupied, vacant or derelict.

From a business perspective, in addition to collating the information on every house and apartment in the country, GeoDirectory also has 193,000 businesses on its database, with information such as business name, address, and what is known as a NACE code – the international code for classification of business types.

GeoDirectory is essentially a database, albeit a large and complex one. It exists to add value and create greater efficiencies for companies, but it is these end-users usages of GeoDirectory that will resonate most clearly with the public.

For example, one of its first customers was the ESB, whose back-up services need to be available to every one of its customers, 365 days a year. To deliver this service efficiently, ESB Networks has to know each customer's postal and geographic address, and it also needs to allocate each customer an 'electrical address' which identifies the route by which the network supplies the customer.

However, following a detailed survey of its customer base, ESB recognised that it would require more accurate information to ensure that all customers would get advanced warning of any power outage – all 1.9 million of them. It also needed to match each customer to the correct substation. To achieve this, and to standardise its address formats, ESB elected to use the services of GeoDirectory, which allowed the electricity provider to link every building with its correct electricity substation, and to provide every address with a unique Meter Point Reference Number.

Given the vast customer spreads of utilities, telecommunications and broadcast companies, it is little surprise that these organisations should look towards the comprehensive data service provided by



Dara Keogh, general manager of GeoDirectory

TONY O'SHEA

GeoDirectory. But more private companies and public entities have found an ideal solution to their logistical needs through GeoDirectory.

For example, Dominos Pizza has incorporated the technology into its online delivery service, allowing it to achieve its goals of on-time delivery by linking the right pizzeria with the correct customer's address. Similarly, Daft.ie has utilised GeoDirectory to facilitate its users in their search for properties – a notoriously vague pursuit, especially in rural areas where addresses are often unclear.

In the public sector, the 999 Services use GeoDirectory's technology for accurate and reliable emergency response, and the Garda helicopter even uses GeoDirectory when involved in aerial surveillance and pursuit.

In another innovative use, South Dublin County Council uses GeoDirectory for its Connect Me programme, which displays the location of amenities, businesses and services in local areas – an invaluable service, especially for newcomers to the area. And, in Cork, two taxi companies have begun to utilise the GeoDirectory services to minimise errors (and have found that the service quickly paid for itself in eliminating missed appointments and wrong addresses).

GeoDirectory's customer

base has been growing significantly as more companies realise the benefits of reliable information. But for the future, these sorts of GeoDirectory services will be available on phones (to people who have GPS-enabled phones) – be-

cause people often need information most when they are outside the home.

"As attitudes and lifestyle are changing there is a dual requirement for both on the move connectivity and information," said Keogh. "People

want to know about services such as restaurants, doctors, petrol stations, etc, and how to get to them from where there are now. GeoDirectory works with the businesses that facilitate this change in attitude and change in lifestyle."

## Planning and design brought closer

GIS and Cad often represent two sides of the same coin when it comes to a construction project, each forming a crucial part of the planning and design process. However, the trouble is that it is often difficult to see one side when concentrating on the other. Despite their obvious synergies, there is frequently a lack of cohesion between the GIS department and the Cad department, and this often leads to delays, not to mention the possibility of outdated information becoming self-propagating down the line.

"Typically, an organisation such as a local authority will have a lot of data in its GIS database," said

Brian O'Connor, geospatial sales executive at Cadco, whose AutoCad Map 3D is in the process of revolutionising the industry, by bringing GIS and Cad closer together.

"But Cad teams and designers need to be able to access this data. So, rather than having to go to the GIS office, it makes much more sense to be able to extract it directly from a database."

Eliminating the gap between GIS and Cad will have a number of benefits, even outside of simple efficiencies and man hours. For example, the re-integration of Cad into the GIS information database allows for far greater accu-

racy, not to mention cutting down on the reams of versions of information which could be floating around on data sticks or on hard drives – one could have pre-design GIS, post-design GIS, or a differently designed GIS, but unless the process is integrated, these will all exist independently.

"You could have very sophisticated GIS, but you may not be feeding your as-built information back into it," said O'Connor. "Re-integration of designs into the database can take time – what we are saying is that you can do it quicker and more efficiently by using a product such as AutoCad Map 3D."

## WE HELP THE EMERGENCY SERVICES FIND PEOPLE FAST

Now we can do it for your company too!

GeoDirectory has given every building in the Republic of Ireland its own fingerprint: a unique, standardised address pinpointed to an exact location by the combined expertise of Ordnance Survey Ireland and An Post.

Having this information at your fingertips could help you plan, analyse and evaluate far more easily – just like organisations such as the emergency services, Vodafone, Sky TV, Domino's Pizza and many others have already done.

To find out more, visit [www.geodirectory.ie](http://www.geodirectory.ie)

Telephone 01 705 7005

