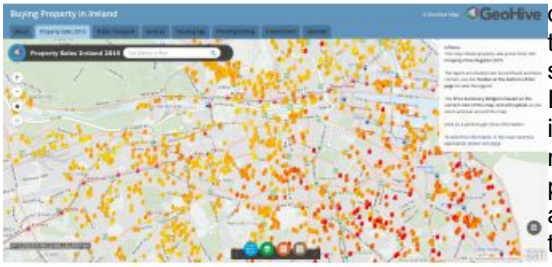
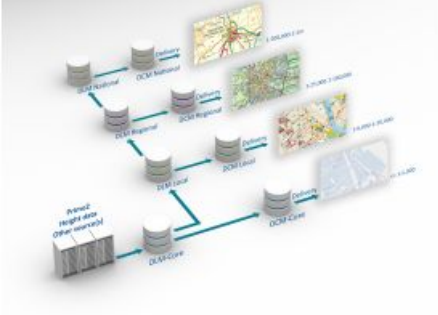
ORDNANCE SURVEY IRELAND SHOWS NEW PERSPECTIVES, PART 2

National Mapping as a Service





National mapping organisations from all over the world are interested to see how Ordnance Survey Ireland (OSi) is planning for its future. Not only has OSi re-engineered its work processes and implemented a multi-resolution data store to automate product and service delivery, but it has also developed a collaborative portal and is leading the way towards a National Mapping Agreement. OSi is now in the process of making 'linked data' available for all 50 million Irish real-world objects.

Ordnance Survey Ireland (OSi) has a clear technical strategy for offering national mapping as a service. In its own words, OSi wants to offer its users the streaming of "multi-resolution, spatial products and services in industry data formats from a single source of high-resolution topographic truth". The 'National Mapping-as-a-Service' strategy is one of the reasons why OSi migrated numerous legacy multi-scale databases into a single, scale-independent database known as PRIME2. It also implemented orchestrated, rule-based production workflows to enforce the highest levels of data quality, while enabling significant resource efficiencies in the various stages of data management. The newly developed data model is the foundation for OSi's Multi-Resolution Data Store (MRDS) where the data objects are brought up to date maintained once and are then automatically processed to produce a wide variety of information and products. This initiative makes it possible for OSi to be the first national mapping agency in the world that can automatically produce 1:1,000,000 cartographic products and services from its 1:1,000 topographic database. For more information about that, read Part 1 of this series on OSi in the December 2016 issue of *GIM International*.

Make your Map

About a year ago, OSi launched a web-based geoportal called GeoHive, which provides free access to Irish spatial data through a data catalogue and a map viewer. MapGenie, a commercial web-mapping service, already existed, giving both public-sector and private-sector customers access to map data. However, the use of MapGenie requires OGC-compliant GIS software or web applications, whereas GeoHive data can be queried and visualised directly.

On GeoHive, you can create maps specific to the task at hand by combining layers of location-based information from a range of public-sector bodies. Being fully responsive, the system reconfigures itself depending on the device used to open the application, e.g. either a PC or a smartphone. Colin Bray, OSi's CEO and chief survey officer, comments: "When developing this service with Esri, we chose to look from the perspective of a user with no GI knowledge and we've included user-friendly 'story maps' to show the power of combined data sources." OSi developed a tool called Make Your Map, which enables you to combine the map and authoritative data of your choice, save it on the platform for later use and share it via email and social media. You can use Make Your Map to mash up public datasets and create a map view that tells the story you need. If you are an

investor, you can look at variables such as population density, industry distribution, education, journey times by mode of transport, etc. and use this information for informed decision-making, such as choosing your office location. Another application within GeoHive is to investigate where to buy property in Ireland. You can evaluate and compare different locations by analysing transport systems, average house prices, schools, hospitals, housing age, planning zones, etc. “If people think that different stories can be told, or if the stories could be better told by using additional datasets, then we are very open to receiving suggestions,” states Bray. “If we see a topic in the media that can be better explained with spatial information, we will look at what other publicly available datasets are out there and bring them together to tell the story.” At a technical level, GeoHive uses the functionality of ArcGIS Online as its content management system for listing and categorising web services.

Linked Data

The changing world of content delivery offers new perspectives for OSi’s mapping-as-a-service strategy. The organisation has been working with the ADAPT research Centre at Trinity College, Dublin, on the creation of a linked spatial data management model. ‘Linked data’ marks a shift from human-readable HTML documents that are connected via hyperlinks to machine-readable documents that allow for connections of data between web systems across the globe. The publication of OSi’s geospatial data as linked data on the web enables third parties to explore and consume the data via a combination of simple, standardised technologies, such as Unique Resource Identifiers (URIs) that operate over the internet’s existing HTTP infrastructure (a URI identifies a resource either by location or by name, or both). The data is available both via Triple Pattern Fragments Server and Web Client, a linked-data front end (e.g. by following the HTTP URI of *county Dublin*) and as downloadable datasets for local use. OSi’s PRIME2 database is made up of over 50 million uniquely referenced geographic objects, and many of them will have URIs in due time.

OSi has created a new linked data standard for high-resolution geometry: the Geospatial Linked Data Standard. Bray explains: “The existing standards were not good enough for large-scale spatial data when part of the geometry changes. Users must be able to drill down, getting different resolutions of the data, going from seeing a hundred objects to one aggregated object in seconds. Those objects need to be able to link back to the source. And that is what this new standard is doing.”

But everything can’t be done at once. Therefore, because administrative boundary data has enormous relevance to many public organisations, OSi chose to make that available as linked data first. Via the dedicated Linked Data platform, third parties can consult authoritative administrative boundary data and develop novel applications on top of it. For example, the Linked Data platform could be used to access Irish administrative boundary data and then to combine it with the 2011 Census data, which has been published by the Central Statistics Office as open-source linked data. Additional datasets are being made available and new stories will be told.

National Mapping Agreement

GeoHive and the linked data initiatives support the Irish Public Sector Reform Plan 2014-2016. Under this plan, OSi was asked to develop a national spatial data strategy and to create a National Mapping Agreement to ensure that a national geospatial platform can be released for the public sector. This indicates central government’s recognition of the importance of geographic information. Bray expects the National Mapping Agreement to come into effect in 2017. “That will enable us to open up all of our data to the public sector under a centralised licensing agreement. Mapping is not just about locations anymore – nowadays, it’s about objects. We had 5,000 map sheets that described the large-scale data for Ireland, and we now have a single database with millions of unique objects. Each of those objects has a location reference. We have to make sure that all public organisations talk about the same objects and the same ‘somewhere’. That’s why part of the developing national strategy needs to be education and awareness, and we will support our colleagues in their transformation.”

The Near Future

An initial study showed that the use of geoinformation in government saves EUR82 million per year in running costs. “And that’s a conservative figure, based on the current, limited use. So we intend to undertake another study in three years’ time, when our data platform is further embedded in government planning and decision-making. We foresee further quantifiable cost savings and efficiencies for government from the use of a national standards-based geospatial platform,” says Colin Bray. “There are already many more users than in previous years who take our data as an interactive layer in their own systems. At the end of the three-year period, we want to be the national providers of trusted, maintained spatial data and platforms. We want to be the enablers making the state’s spatial data easy to find, share and use.”

In Bray’s view, OSi supplies the state with an authoritative geospatial platform, but the maintenance of the databases will continue to be based on a federated approach. For example, OSi collects the road geometry but the National Roads Authority provides the attribution. “The types of objects, features and details will grow, but we don’t have to do everything ourselves. As for our own database, we are now preparing to update it in 3D. We also need to consider the inside of buildings and see how we integrate with the concepts of building information modelling (BIM) and of mapping below ground – not only what is visible. Technology will give us directions in what is doable, as it has always done in the past.

Output

Besides MapGenie and GeoHive described here, there is also Geoportal (www.geoportal.ie), which is a shared government resource, developed and maintained by OSi, designed to facilitate the viewing and downloading of spatial data according to the requirements of the EU INSPIRE Directive. All EU countries have such a national portal for their core national reference datasets. Ireland additionally has the national portal www.data.gov.ie, on which OSi has over 50 open datasets.

Ordnance Survey Ireland is Ireland’s national mapping agency, a state body. Its funding model is made up of commercial

revenue (81%) and national interest mapping (19%). 60% of its commercial income comes from the public sector.