

The Client

Ordnance Survey of Northern Ireland (OSNI) is an Executive Agency in the Department of Culture, Arts and Leisure (DCAL) and is the official Government organisation responsible for supplying mapping and geographic information services for Northern Ireland, the organisation currently employs 167 staff.

OSNI's current digital mapping system was installed in the mid-1980s and was designed primarily to convert the hardcopy topographic archive into digital form. Between 1990 and the present day the system has been continually developed to provide map updating capability and surveying functionality. The digital conversion programme was completed in 2000.

OSNI's mission is to contribute to the public good by supplying the mapping information for Northern Ireland.

The Problem

OSNI required a map update and maintenance system (hardware, software and processes) to store and update its large and small scale mapping databases. The system had to:

- Create an efficient and effective map update and maintenance system enabling the introduction of a fully integrated workflow across the organisation, from identification of change, through survey & data capture, edit, update and loading to database;
- Create a spatial database capable of holding all OSNI digital map data, that can efficiently and effectively support OSNI map update and maintenance processes and support other OSNI production flowlines and products that either directly or indirectly use the large-scale data, including existing customer supply systems;
- The system was expected to support both office and field based workflows and enable digital map data to be updated by digital photogrammetric workstations and pen-based mobile systems.

Following the successful implementation of a system it was important for OSNI to develop a strategic relationship with the supplier as such a production environment was likely to continuously develop through a programme of support and enhancements.

It was essential that during each stage of this phase of the project the service to existing users of OSNI data, both internal and external, was maintained.

The Solution

In February 2003 OSNI awarded a contract to ESRI and Tadpole Cartesia to develop the Mapping Information Database And Surveying ("MIDAS") map production system. In order to ensure continuity of service to OSNI customers

(both external and internal) the system was implemented in the following stages:

- Stage 1 Development and implementation of an operational data store (hardware, spatial database and database management software) capable of holding key topographic and other reference data for Northern Ireland (vector, raster, height and dtm).

- Stage 2 Migration of OSNI Large Scale digital topographic data (graphic, address, photography and textual data e.g. addresses, vegetation, etc.) to the data store.

- Stage 3 Development and implementation of map update system (software and hardware) including interfaces to OSNI's existing photogrammetric system as well as EDM and GPS field survey devices.

- Stage 4 Development and implementation of link to the Pointer address database to enable updating and maintenance of OSNI-specific address information within Pointer by the map update system. Integration of system to select, view and print photographic images held within the data store.

In parallel to the technological aspect to this migration it was important to analyse the existing business processes within the OSNI map production unit in order to remove any limitations imposed by the current systems. To this end a business process review was carried out, taking into account existing processes as well as OSNI's long term objectives. The purpose of the BPR was to alleviate any existing bottlenecks in the end-to-end processes, refocus the flowlines, and ensure that OSNI achieved the maximum possible benefits to production throughput.

The Result

OSNI now manages and maintains a single spatial data repository which forms a continuous map-base for Northern Ireland. The map production system, for the first time, facilitates a fully integrated end-to-end workflow allowing OSNI management to monitor and track each business process and work flow within the production of large scale map data.

This workflow was optimised through the tasks carried out in the business process review. Each business process involved in the production of a large-scale map is broken down into a set of steps for the user. To manage a work-

flow the user simply creates a new job and is guided through the process of map production via a series of manual and automatic tasks.

MIDAS underpins the maintenance of OSNI's map based data and information, and will assist OSNI in its ongoing programme of quality improvement.

The Technology

MIDAS is delivered on ESRI's ArcGIS framework and utilises ArcEditor, the Job Tracking (JTX) extension and ArcSDE from ESRI and the Field GIS extension and Graphic Tool Suite from Tadpole Cartesia.

The system was delivered through the implementation of ArcSDE software to create the spatial database repository. Interfaces were then created from this central database to the air survey and field survey business units. This involved the development of interfaces to OSNI's existing photogrammetric system in air survey, and the development of a suite of graphic survey tools and EDM and GPS device capability built on ArcGIS in field survey.

The solution is deployed on standard desktop PC's within OSNI and more importantly on ruggedised tablet PC's to OSNI's surveyors for the data capture and update of information in the field.