



The virtual organisation enabled United Utilities to overcome the restrictions of space and time to the company's full advantage, greatly reducing constraints and involvement in managing a major offshore operation and allowing me to effectively manage and control quality, schedules and cost



Customer Focus

Company:

United Utilities

What they do:

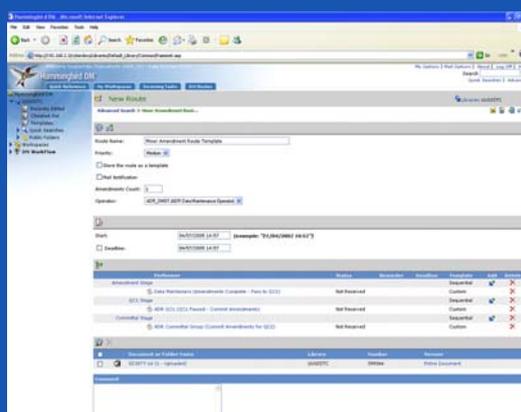
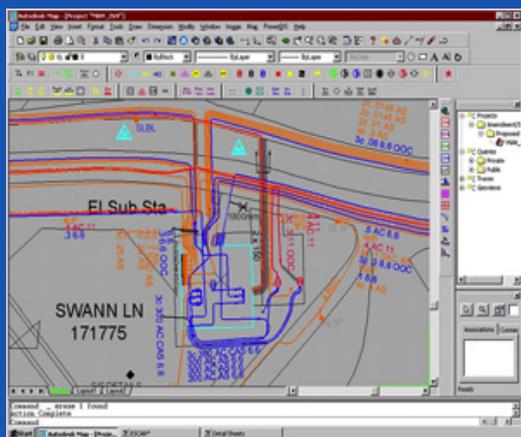
United Utilities principal activities are managing and operating the regulated electricity distribution, water and wastewater networks in North West England.

Project title:

GIS Quality Assurance

The project:

A quality control process which involved checking the accuracy of features and associated attributes, with responsibility for passing or failing data, broken down into 282 batches each comprising in the region of 45,000 features



Project : GIS Quality Assurance



Responding to the needs of an increasingly regulated and demanding utilities market, United Utilities embarked upon a major project to implement a fully integrated GIS model of their electricity distribution network serving over 2 million customers across the North West of England.

The GIS project was partly undertaken to help meet regulatory requirements for standards of service and to enable prompt and accurate identification of physical assets relating to specific customers so that fault identification and, where appropriate, compensation requirements could be achieved.

Providing a comprehensive geographical representation of the entire network and modelling the connectivity between physical assets e.g. sub-stations, transformers, cables, joints and street furniture etc, the GIS model has enabled United Utilities to improve service delivery by helping response times of accurate, reliable and up-to-date information utilised by planning and operational staff, as well as field engineers via ruggedised laptop computers.

Comprising 12 million asset features, more than 100 million attributes and a further 2.4 million address features, the GIS model took over 2 years to complete at a total cost of £9.62M, incorporating 45,000 km of underground cables, 14,000 km of overhead lines and 18,000 sub-stations.

Cad-Capture had previously established a close working relationship with United Utilities following the successful completion of the ESCAR project, involving the capture of 210,000 large

format paper network records that were based on OS mapping and in multi colour format to represent the various network voltages. These paper records detailed the electricity distribution network, previously held at drawing offices in Manchester, Preston, Kendal and Carlisle. Seen as a 'stepping stone' to a fully integrated GIS model, the ESCAR project provided United Utilities with a seamless raster map base of the network within GIS.

Selected for its ability to complete such a large scale project in the short timescales required by United Utilities, Baymont, a U.S. based provider of data conversion services was awarded the conversion contract to digitise features from the ESCAR map base from its offices in Malaysia. At peak, the Malaysian operation would have more than 700 staff working on the GIS project.

Cad-Capture was selected to provide quality assurance services for the project, a major 2 year contract worth £1.8M. A high knowledge activity designed to add value to the building of the GIS model, the quality control process involved checking the accuracy of features and associated attributes, with responsibility for passing or failing data, broken down into 282 batches each comprising in the region of 45,000 features.

Cad-Capture's innovative approach to quality assurance was critical to the success of the project.

Automating as much of the checking process as possible, Cad-Capture pioneered the use of internationally recognised statistical sampling techniques based on ISO 2859 to provide a confident measure of conformance, helping to develop a specialist library of functions such that checks could be performed in a systematic and rigorous manner, thereby minimising the potential for human error and increasing process efficiency.

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Cad-Capture was required to implement its expertise in:

- 1) GIS
- 2) Quality Assurance



Project Overview:

The virtual organisation enabled United Utilities to overcome the restrictions of space and time to the company's full advantage, greatly reducing constraints and involvement in managing a major offshore operation



Different Acceptable Quality Levels (AQLs) were applied to the statistical sampling process. For example, because United Utilities placed great emphasis on the accuracy of Detail Sheets, an AQL of 0% was applied, requiring 100% inspection. For other areas such as, e.g. Feature Geography, a more relaxed requirement was appropriate.

During phase #1 of the checking process, digitised data submitted by Baymont was subjected to the following series of checks, applied with a 100% sample rate.

Attribute completeness ensures that all attributes required to be populated have a valid value. Connectivity completeness ensures that each connected feature has a connectivity record and is connected to the correct combination of other features types.

Ownership Identifies where features must own or be owned by other features, confirming that the correct relationship is established and an ownership record is in place.

Batch edge nodes Ensures that all edge nodes are within a set tolerance of the batch edge and are connected to a defined feature.

Phase #2 of the checking process required a QC operator to systematically step through features from the digitised data set, automatically sampled and presented to the operator in accordance with an agreed statistical sampling rate, such that specific properties could be isolated and the following checks performed in a dichotomous manner (e.g. PASS/FAIL).

Feature completeness Validates that the asset has been captured correctly. In this instance, the data set is sampled by generating random coordinates with the operator to identifying the asset nearest to the coordinates using the raster map base.

Attribute correctness Validates that the correct attribute value has been entered against a feature and that all attributes are recorded correctly in accordance with the digitisation specification for all mandatory attributes. The sample is taken by feature and all attributes associated with the feature checked.

Detail sheet correctness Validates that details from the raster map base are presented correctly with the appropriate orientation and correct feature association.

Connectivity accuracy Validates that the feature has been connected correctly.

Graphical placement Validates that the placement accuracy is within a prescribed tolerance.

Cad-Capture also played a key role in the development, implementation, maintenance and operation of the IT infrastructure, an essential enabler for a 'virtual organisation' formed by Cad-Capture, United Utilities and Baymont.

Driven by developments in information technologies including, in particular, Document Management, Virtual Private Networks and Broadband Internet connectivity, the interest in virtual organisations has grown considerably over the past decade.

United Utilities identified the need to establish a virtual organisation as an enabler for the successful and efficient completion of the GIS project and enlisted Cad-Capture to turn this vision into reality.

Based on market leading Document Management technology from Open Text's LiveLink ECM - eDOCS™ content management platform, Cad-Capture developed a secure and scalable environment for managing, accessing and collaborating on the large volumes of project related data in a controlled and efficient manner across the virtual community.

A Virtual Private Network (VPN) provided ubiquitous and secure access to content, dissolving traditional supply chain barriers associated with differences in geographic location and time zones, enabling United Utilities to minimise costs by taking advantage of the commercially attractive Malaysian economy, whilst benefiting from the high knowledge economy of the U.K.

Brian O'Neill, GIS Project Manager at United Utilities said, "The virtual organisation enabled United Utilities to overcome the restrictions of space and time to the company's full advantage, greatly reducing constraints and involvement in managing a major offshore operation and allowing me to effectively manage and control quality, schedules and cost".

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