TBC ADAC XML DATA TRANSFER

TECHNICAL FOCUS

CHRIS POWER, UPG GEOSPATIAL APPLICATIONS ENGINEER, EXPLAINS THE FUNCTIONALITY (AND THE MANY ACRONYMS) OF IPWEAQ'S ASSET DESIGN - AS CONSTRUCTED SCHEMA

ADAC can be viewed as part of a merging between Land Surveying and GIS. It brings the discipline and accuracy of Surveying and the data capability of GIS together establishing benefits to both. For example Surveyors benefit from the expanded use of attribute tree structures as a means to rationalise field code lists, while GIS gains smoother, more reliable data flows. The benefit for the public is that spatial data is sourced directly from 'as built' surveys and not filtered through the dubious paradigm of heads up digitization and/or a string of spatial data format conversions.

The standardisation of spatial data is a long warranted requirement. ICSM have been working towards a harmonised data model since last century. Spatial data users are generally well aware of the benefits of streamlining data, and securing data standardisation at the source is fundamental to its successful implementation. Surveyors are the principle source of critical spatial datasets and ADAC provides a means to put standardisation into everyday workflows. Bringing public works and services assets into a harmonised model is a great achievement. ADAC is putting a big piece of the puzzle in place and this should encourage advocates of data standardisation in Transport and Mining to advance spatial data harmonisation in their respective 'as built' and design spatial data environments.

TBC, ADAC and GIS

TBC is a 'next generation' survey and construction software package. The software is underpinned by geodetic architecture which maximises the benefits of global positioning infrastructure and provides a clear and rigorous pathway to translate survey and design information between ground coordinates and standard projections. TBC has undergone extensive expansion reflecting the significant technological advancements which have occurred in Surveying and Spatial Science including GNSS, multi-stations, laser scanning, UAVs and terrestrial photogrammetry. Part of this expansion has also included the development of strong GIS oriented capabilities including...
a feature attribute spreadsheet which includes a customisable data filtering capability. Given that the ADAC context is easily described in GIS terms, these tools amount to a market advantage as the attribution demands of ADAC are clearly ameliorated by GIS style data manipulation options.

**Feature Definition**

The IPWEAQ ADAC schema provides the standardised data structure which was used as the basis for our feature definition file (ADAC_TBC.fxl). In terms of structure we undertook a degree of ‘flattening’ in order to make use of Trimble’s pre-existing solutions. For example Trimble’s software package “Feature Definition Manager” uses only three levels (category, feature, attributes) whereas the xml tree structure has, theoretically at least, an unlimited number of classification levels. This was accommodated by creating additional features which are subsequently mapped to and from the original tree structure on import and/or export. An example of this is where the schema calls another classification level to differentiate between circular, rectangular and custom sewerage manhole types, we simply created as separate features in the ADAC_TBC.fxl. The majority of ADAC features are defined using only three levels.

**ADAC Import/Export**

The program reads ADAC XML files into in-memory objects containing the file’s descriptive data fields as well as properties to represent ADAC domain class categories and subsequent objects. These are then reflected to obtain feature objects with instantiated attributes and geometries which are passed into TBC feature objects.

The exporter creates the project header using domain level data stored in the UI (ADAC Settings), then loops through selected objects, allocating objects according to geometry, before creating interim objects (to allow for final adjustments), and mapping these to ADAC features and creating the ADAC xml document. Although the export includes a sanity check to allow for pre-export validation against the schema, this check is currently bypassed due to resource priorities at the time of development. Plans to include this checking in later versions are currently in place.

**Conclusion**

IPWEAQ’s ADAC schema makes an important contribution to Australian Spatial Data Infrastructure. If an intended effect of the harmonised data model is to reduce the time wasting and data degradation sometimes associated with expedient proprietary format conversions, then ADAC will easily prove its worth. Data can be transferred to and from any participating platform without significant loss or degradation. Data specification is divorced from the software proprietor, effectively removing self-interest as a potential design factor, and promoting broader innovation. TBC functionality easily lends itself to ADAC workflows and this made it a relatively simple process to implement ADAC in TBC. The outlook for ADAC depends on the availability of tools and the ease with which the can be used. TBC has now added another option for Surveyors and Engineers that is definitely worth a look.