Doubling Productivity with a Web-Based Solution for As-Built CAD Drawings

Case Study: Jemena

"What has become business critical is maintaining the model, the representation of the electricity network in the GIS system used by our control systems. The timeliness of upkeep and the accuracy of representation are important. The FME solution from 1Spatial puts us in a position where we are a little bit future proof."

Brett Wilson, GIS Electricity Team Leader, Jemena

Industry	Energy Utility Infrastructure
Customer	Jemena, Australia
Challenge	Increase productivity of GIS Electricity Team members to meet increased demand.
Solution	A Web-based solution developed and deployed in FME that automatically transforms as-built AutoCAD drawings of underground infrastructure, seamlessly uploading them to Jemena's GIS system.

Key Benefits:

- Automated transformation has doubled the productivity of GIS Electricity Team members.
- 1Spatial reduced Jemena's financial risk with a proof of concept that validated its approach.
- Team members do not require advanced drafting skills to transform and upload drawings.
- AutoCAD drawings are not subject to human interpretation or manipulation prior to upload.
- Ensures that CAD drawings from different contractors conform to Jemena's standards.

Jemena

Overview

Jemena owns and operates a diverse portfolio of energy assets across northern Australia and Australia's east coast. With more than $12.4 billion worth of major utility infrastructure, it supplies millions of households and businesses with essential services.

Within this portfolio, Jemena's network distributes electricity to over 370,000 customer sites via approximately 6,800 km of distribution system covering over 950 square kilometres of north-west greater Melbourne. This incorporates major industrial areas, residential growth areas, established inner suburbs and Melbourne International Airport. The region has one of the fastest growing populations in Australia – a major contributor to Melbourne overtaking Sydney as Australia's most populous city.

To meet the increasing demand for electricity, Jemena contracts infrastructure construction companies to build new assets. As underground networks are now standard, there is increased reliance on GIS systems to accurately model critical assets that cannot be seen.

Challenge

Jemena relies on its GE Smallworld GIS system to model its electricity asset base and plan its program of work, with data about new assets submitted by contractors via "as-built" AutoCAD drawings.

Although Jemena developed an AutoCAD template to import as-built drawings more easily into its GIS system, data often varied from the standard template, with variations from contractor to contractor. To ensure the integrity of GIS data, drafters with specialist CAD and GIS skills validated and "cleaned up" the as-built drawings to conform with Jemena's AutoCAD template before uploading them to the GIS.

The volume of that work "has grown exponentially over the last 3-5 years, probably at around 20-25% per year," according to Brett Wilson, GIS Electricity Team Leader, Jemena. "We had to be more efficient in what we were doing. The volume was too great and we were starting to generate a backlog."

While Jemena was able to meet its statutory obligations, including uploading the as-built CAD drawings into a public register – in this case, the Before You Dig service – the GIS team also needed to meet internal key performance indicators (KPIs) which reflect how critical it is for Jemena to have up-to-date information.

"We have an internal KPI of 30 days to get it into the GIS. But we try and do it in 10 to 15 days," said Brett. "We had two choices to meet increasing demand – get smarter or get more people. We decided to get smarter."

Solution

After hearing about FME's ability to transform and upload CAD drawings into GIS systems from another major utility infrastructure company, Jemena's Digital team and the Network business team worked with 1Spatial, as Australia's longest serving premier platinum partner and reseller of Safe Software's FME data integration tool in Australia, to develop a solution.

To minimise Jemena's financial risk, 1Spatial proposed a proof-of-concept solution based on sample input and an indicative set of business rules. Based on the proof of concept, Jemena could have confidence that FME could do the job and gain a full understanding of the cost without making a full financial commitment.

The proof of concept proved highly successful. The partial solution implemented most of the transformation required at three times the speed of manual processing. That meant that a GIS team member could use FME to process a sample drawing in under an hour which had previously taken over three hours manually.

"Based on some fundamental rules, 1Spatial showed that FME could transform a drawing in a very short period of time that was 75% of the way there" said Brett. "You could see that it could quite easily convert points and join lines, for example, and upload them to the GIS."

In the second stage of the project, 1Spatial added more features to the FME transformation and implemented a full set of business logic to validate and transform a wide range of input data. It also deployed the solution in FME Flow, so that GIS team members could submit an AutoCAD drawing via a secure Web page and quickly integrate the transformed data into the GIS system.

The end result is a Web-based solution that doesn't require specialist CAD skills and enables team members to validate, transform and upload about three as-built drawings a day into the GIS system. This is twice as many as they could previously process, effectively doubling their productivity.

"I can use a GIS team member without a drafting background with the FME solution. It generates an output that they can just open up and look at. You don't have to use people with skills that are in high demand or who have disappeared from the workforce."

"With FME you are not manipulating the data and having to be subjective, you are transforming it. One of the biggest problems with manual transcription is the risk of interpreting the data wrongly. Now, any corrections are made in the GIS system and not within the CAD drawing. We are maintaining it in the source, which is a more efficient way of operating."

– Brett Wilson, GIS Electricity Team Leader, Jemena

"We first did a proof of concept to see if we could automate the manual cleanup process. We had some sample input and we collaborated with Jemena staff to understand their business logic. We demonstrated that an AutoCAD file could be cleaned up and converted into their template and Jemena were happy with the time reduction and the efficiencies gained."

– Ashish Manandhar, Senior Consultant, 1Spatial Australia