

Suggested DAD over CAD could save millions

September 2 2013, by Nic White



Mr Kennedy says the size and complexity of electrical systems has grown phenomenally, containing 1000 times more information than 30 years ago.
Credit: Lafayette College

New engineering design software could drastically improve the efficiency and accuracy of electrical system documentation and save the construction, minerals and energy industries millions in labour costs.

Electrical systems documentation – blueprints that tell engineers how to install the cables and components in a project – is usually delivered as a series of 2D drawings that maps out how the system fits together in a schematic, known as Computer Assisted Design (CAD).

However, this often involves hundreds of drawings drafted by different

people that do not line up perfectly, and according to research, causes repetition of objects and makes the documentation complicated, confusing and prone to mistakes.

Any changes must be manually edited into each drawing, leading to inconsistencies and further errors.

[Previous research](#) by Curtin University Built Environment Peter Love found 449 errors in the 106 schematic drawings and one cable schedule, designed using CAD, of an [iron ore](#) stacker conveyer built in 2008 as part of a Pilbara mining project.

Professor Love says a shift to a System Information Model (SIM) approach would significantly reduce errors and engineering [design time](#).

Systems engineering firm I&E Systems have designed SIM software and procedure package Dynamic Asset Documentation (DAD) that emphasises objects and the connections between them over CAD's schematic map of the entire system.

"That's the trick that's probably unique to our model, that we have a sense of connections within our data objects so you can follow connections easily," I&E managing director Dermot Kennedy says.

"Whereas if you were adding something to an existing CAD documentation, you'd add symbols to some drawings and lines to others ... you can't tell where any item will be on the drawings so you have a complexity that drives a lot of cost," he says.

Mr Kennedy says the size and complexity of electrical systems has grown phenomenally, containing 1000 times more information than 30 years ago, making schematic modelling less viable.

DAD instead uses attachments to items in the software to give instructions on cable length and other properties and does not attempt to spatially represent the system, preventing redundancy across the documentation.

All items are in a database and any changes to them or their connections are automatically updated across the model to remove inconsistencies.

According to Professor Love's research, each of the 107 documents would take about two hours to produce using DAD compared to almost 40 hours in CAD.

This could save \$523,000 (94.22 per cent cost reduction), even though DAD draftsman earn \$20 more an hour.

Provided by Science Network WA

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