KarelCAD working with Autodesk Geospatial Solutions

KarelCAD are suppliers of Autodesk design solutions and CAD training in Australia and New Zealand. According to KarelCAD, local government engineers are using information systems as a means of increasing their productivity. The main technologies used include Computer Aided Drafting (CAD), which enables fast access, editing and printing of designs.

The limitations of this technology is due to the standards for output is little more than an electronic version of the paper it replaced and therefore lacking the capacity for integration into other corporate applications.

Additionally, engineering data created in this standard limits designers' ability to lever off other technologies, such as geographical information systems (GIS), to better communicate design, environmental impact and integration within the urban landscape.

While the move from hardcopy paper to CAD was a major step for designers, the way the data is created and stored by many local government designers has remained unchanged for more than a decade.

Traditional CAD is stored in 2D blocks and annotation layers. It is still an accepted standard for laying out subdivisions, road works and reticulated assets. This results in data, which needs to be re-entered and translated prior to reuse by other applications (e.g. GIS).

While any CAD file can be considered better than the hardcopy, the requirements of current applications include interoperability - the ability to reuse data. A fundamental for corporate information systems is the attainment of a single point of truth for data. Simply, as long as the engineering data lacks interoperability, it is an island of information.

Further, the productivity benefits of moving engineering design towards environments that enable data level integration are apparent when considering that up to 80% of all data in a GIS or asset system is created in engineering CAD applications.

Sharing other applications' data is also beneficial to engineers. For example, the use of GIS data (aerial photography and digital terrain models) has the capacity to reduce project times, reducing road closures and improve predictive modelling such as water flow analysis. Therefore, the toolset for the contemporary design engineer would include the capacity to consume data not traditionally considered CAD.

Future engineering design data will be more in demand, with the shift to the digital urban environment. The current trend is exemplified by Google and Microsoft's virtual cities. Both companies are currently creating 3D models of the major cities around the world. The data making up these models is typically from aerial images and therefore lacking internal content.

These interfaces, and others coming into the market, will be extended to modelling, such as water consumption or patterns of power usage based on actual occupancy. The inclusion of the original design information will extend engineering data further and offer real benefits to engineers and town planners.

Architects have already moved into such an environment and made data standards open and accessible. These designers have the options of model-based design where they select a wall object and move it into place and give it dimensions.

The object determines what materials make up an object of that type with those dimensions, including plasterboard, battens and bricks. The designer takes a door and places it into the wall and the objects interact removing the door dimensions equivalent in materials from the wall.

Further, the object also knows the model number and supplier of the door. The completed model of a house then is located and orientated to determine the heating and cooling required and the size of air conditioner is determined. This is all achieved in the building information models (BIM) standards.

This change in way data is treated has added another benefit to building designers as the modelling requirements of a building are also possible. Finite element modelling is incorporated into the application allowing designers to

size supporting structures and the insulation properties of the combined elements are known making the sizing of air-conditioning possible.

Applying this to current asset engineering data would mean that the 3D construction of bridges and pump stations has been included as a standard. It would allow for all information of reticulated assets to be collected and the data would be georeferenced.

When these assets are placed in a digital city, be it Google, Microsoft or other, one can then expect to model traffic outcomes of a new bridge, the impact of an apartment on water pressure and the visual effect of a proposed development. It is appropriate to examine the requirements of these digital environments as the data we collect today will contribute to their value.

Right now, engineering data has the potential to be stored, managed and accessed in an open standard. This enables the use of data for multiple users, outside the engineering department, and has the potential to improve the ability of a local government to complete its town planning, environmental and asset management obligations now and into the future. The key to this is open and accessible data, visualisation of design and intelligent use of current design technologies.

For more information about Geospatial solutions through KarelCAD please contact our solutions team on 1800 223 562 or visit www.karelcad.com.au