Q&A WITH CHRIS ANDREWS, SENIOR PRODUCT MANAGER 3D AT ESRI

5 Questions about BIM and GIS



There has been much debate on the synergy of building information modelling (BIM) and GIS (geographic information systems). This makes for a potentially powerful combination, but what is the best way to maximise the advantages of the two? Not surprisingly, data plays a crucial role in delivering on the promise of transforming infrastructure design and construction. At '*GIM International*' we decided it was high time to ask a renowned expert from the field to share his views with our readers. Chris Andrews, senior product manager 3D at Esri, answers five key questions about the journey towards optimal integration.

BIM and GIS integration is often presented as the optimal solution for the movement of data throughout the asset lifecycle, but it is not so easy in practice. What are the biggest misconceptions?

One of the most obvious misconceptions when customers ask for the ability to use their design and construction data (BIM data) with GIS is that BIM models contain 'all' the data about assets. Typically, a BIM model is only a representation of what was built. Even the most accurate as-built BIM model will rarely contain the furniture and other unfixed assets that actually exist in the operational real-world structure. Another misconception is that BIM contains facility management information. For example, in architecture models we rarely see rooms, spaces or even a footprint of the building. These geometric properties are useful for building-asset management and space allocation, but they aren't necessary for building construction. From this perspective, the BIM is often missing information. Lastly, everyone – including many BIM practitioners – forgets that BIM applies to multiple, diverse industries. Architecture, civil transportation and utilities all use BIM processes, but have divergent data and construction needs.

What is needed to further enhance the combination of BIM and GIS?

Critical to more efficient, resilient data interoperability between BIM and GIS will be the establishment of lightweight exchange formats and interfaces for access to data across domains. GIS is largely open. There is a robust geospatial open standards community. Esri publishes interface and format specifications for access to just about anything a system integrator could want to access in ArcGIS Online, ArcGIS Enterprise or a geodatabase. While the BIM world has some similarities, we find that open-standard BIM exchange formats can be complicated and incomplete. There are also many proprietary BIM model formats that are black-box data stores with little or no ability to access their content. We understand that BIM content is complex, diverse and often contains proprietary algorithms or techniques, but the pressure to better enable use of BIM data in asset lifecycles is enormous and demands better access to BIM content.

Which steps could software vendors take in order to support GIS and BIM integration?

Software vendors on both sides can work together to provide better access to data, more transparent interfaces to connect systems, and even to use common access and authentication patterns so that customers can more easily combine and use the data that they already own. Customers want to do their work using the tools and platforms that were designed for specific tasks, and more open access to data eliminates attempts to do tasks using the wrong tools. We want customers to be successful with the right data in the right tools, knowing that 'the right data' is a task-appropriate view on the geospatial context and the design and construction detail that makes up our customers' assets.

Data is at the core of the digital transition, but BIM data is usually much more detailed than GIS data. How can BIM data be integrated into GIS data workably?

BIM is perceived to be more detailed than GIS because, to construct a building or bridge, the details have to be specified in the design documentation. With the emergence of 3D as a core capability of GIS, customers are now discovering that 3D

technology enables them to have more accurate geospatial models of plans, proposals and the real world around us. Although what we find is that not all BIM information needs to be captured in a GIS for design and construction data to be used for mapping and spatial analysis, GIS technology also needs to be improved to support many orders of magnitude higher-density spatial information than was necessary in the past. We are not simply working on filters or better translations of BIM to get it into GIS, but – as an industry – we are inventing new technologies to support high-density 3D information about the built and natural worlds around us.

As two essential pillars of smart cities, how will BIM and GIS shape smart city-related developments in the coming years?

The preponderance of data about cities and their inhabitants presents an overwhelming problem for planning, analysis, monitoring and response to world events, environmental change and economic pressures. The key to enabling access to data for any urban problem in the future will be to identify the specific location, things and timing of events and programmes in cities related to the people who will be affected. Simplistically, GIS supplies location and BIM processes supply details about things. A more seamless flow of information about location and spatial characteristics and the design and behaviour of things will be essential to enable government leaders to manage the timing and impact of events and programmes on citizens in our increasingly densifying cities.

About Chris Andrews

Chris Andrews is the senior product manager for 3D across the ArcGIS platform at Esri, based in Southern California, USA. He has focused on strategic innovation projects that have significant market impact in response to customer demand, such as the ArcGIS Earth effort, the Indexed 3D Scene Layer open standard and the Autodesk alliance. He leads a team of product managers focused on customers in the defence, urban and AEC domains.

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