

# 6 Ways Data Analytics is Transforming BIM



The use of building information modelling (BIM) is rapidly increasing in the design, construction, operation and maintenance of building and infrastructure assets. The reason is simple, according to AECOM's James Rosenwax and Ben May: digital technology is making it easier, cheaper and more efficient to manage buildings and infrastructure projects through digital models.

Using BIM, we can make digital replicas of physical assets, processes and systems; the so-called 'digital twins' of buildings. These models show three-dimensional details of construction drawings including structural, electrical, and mechanical elements, and fire safety systems. In addition to these key design elements, there are a variety of other data points that can be included such as material specifications, component costs and the

sequence of the construction and maintenance requirements.

Using such digital models, which draw vast amounts of data in one place, complex calculations can be drawn. In a similar way to how analytics is used to provide insights to financial data, we can now use analytics to interpret the vast amount of data contained within building and infrastructure project models. Many organizations are creating and maintaining digital models across the full lifecycle of an asset, from early design through construction and then into ongoing operation and maintenance.

However, there is currently no 'standard' way that infrastructure owner-operators set their data requirements. They often rely on an information manager (internal or external) to manually process data, which is laborious and time-consuming.

Here we offer six reasons why building and infrastructure owners and operators should use BIM analytics tools to unleash the full potential from their building information models.

## Reason 1: Data insights gathered over time help save projects time and money

The building and infrastructure sector has a poor record when it comes to productivity and efficiency. The opportunity to save time and money on projects without sacrificing the quality of outcomes is increasingly important. Project owner operators often receive models from a range of designers in a variety of formats and there are usually clashes that need to be resolved. Traditionally, this can take a couple of days for specialist BIM teams to analyze.

With access to artificial intelligence tools backed by machine learning, the days of manually extracting and interpreting data should be behind us. These digital tools allow teams to be more efficient and spend less time extracting data, increasing efficiency and accuracy, while freeing up BIM professionals to provide genuine insights and advice.

## Reason 2: Easier compliance with data requirements for an audit

Audits are probably the least pleasurable and most stressful part of any project or operation. If we apply technology smartly, however, they should be a seamless part of our delivery processes.

For owner-operators, digital project models must adhere to either a global data standard (such as COBie, Uniclass or OmniClass) or an organization's custom data standards. To ensure that these requirements are met throughout the design phase, BIM consultants are often engaged to conduct an audit on the model to validate compliance. This ensures that models meet the project-information requirements specified in the contract and are compliant for audit purposes.

We can use technology to automate the compliance process, allowing more time for consultants to analyze the results and work on solutions to identified problems. Automation allows checks to be done more often, at regular 'milestones', for greater confidence that a project is on track. Automation also makes it easy to validate that the model's data complies with the required standards.

## Reason 3: Cost avoidance and improved quality management through project controls

The larger and more complex the projects are, the bigger the chances that inadvertent and unnecessary duplication of orders are made for building materials and specialized labour. Effective supply management can lead to significant cost savings. BIM analytics makes it easier to monitor quantities of building materials to help streamline procurement and delivery schedules – all from the comfort of a site office or a mobile device. Model analytics charts and graphs make it easier to track quantities, with all suppliers and disciplines captured in a fully configurable dashboard.

In a recent project, the AECOM BIM team were able to identify seven different strengths of concrete being ordered. By simplifying this to three strengths of concrete, the team was able to reduce costs, including the time and cost of ordering, delivery, handling and processing. We are only just beginning to realize the benefits of having full control and visibility of all the data that is built into our projects.

## **Reason 4: Geometric clashes are resolved more efficiently, earlier on in a project**

The advancements in digital design tools and fabrication technology has led to increasingly complex model geometry, especially in building architecture. To a lesser extent, this is also the case across roads, bridges and rail projects. There are a myriad of clash detection tools available, which thankfully makes the construction and fabrication processes more efficient. If we take this one step further and apply BIM analytics tools, this allows project owners, suppliers and designers to identify clash relationships earlier in a project's design phase, reducing the likelihood of costly on-site delays.

## **Reason 5: Automated dashboards make communication and collaboration easier**

Major building and infrastructure projects hold regular stakeholder meetings to enable the various design disciplines, owners and project management teams to communicate and collaborate. These meetings are essential to delivering a large design project. In the past, supporting information raised during these meetings was typically manually collated, added to a pdf 'dashboard' and distributed to teams. Whilst this was once cutting edge, it can now be automated and distributed online, reducing the time spent collating data and allowing more time to be spent on collaboration and stakeholder engagement.

## **Reason 6: More efficient handovers**

Accurate, 'as-built,' digital models with resolved issues and clashes, full data compliance and optimized quantities improves construction efficiency and reduces errors and time delays. After construction, digital models can be transitioned to operations and maintenance teams to set up enterprise asset-management systems and building-management systems to support ongoing operations and maintenance.

Using digital technology to drive this process makes it easier to manage the required data handover process and ensures the data is compliant with standards at key points of handover, thereby streamlining the asset-handover process.

*This article, written by James Rosenwax and Ben May of AECOM Australia New Zealand, was initially published by AECON. See [here](#) for the original version.*