By **Adam Taylor**, *Director, Ignite Architects*

BIM – looking beyond design

Ignite Director Adam Taylor, urges architects to embrace all the possibilities of BIM. Those who don't might just get left behind.

IMAGINE A future where every building we work on is not only designed to be beautiful and sturdy but also avoids going over budget, and running costs and energy usage are kept low long after it's built. One where builders have a say in how a project is designed, infrastructure is built before it's needed, workplace accidents are almost nil and no one has to rebuild something because a client isn't happy.

Sounds like a dream - but those of us using BIM are already one step closer to making it a reality.

Architects not making full use of BIM

The latest EBOSS research shows some architecture firms have already embraced BIM, which is great, but that BIM is used very little beyond the very first stage of design.

The biggest challenge we face as an industry is convincing more people that BIM is not a stand-alone package. Increasingly it's just about using modern technology to deliver building projects, whether we call it computational design or digital engineering.

The Huapai Country Club – its architects made extensive use of BIM, not only for its design capabilities but because it enables cost management and sharing with project partners.

Limiting the use of this technology also limits the benefits we can pass on to our clients and risks the New Zealand construction industry lagging behind the rest of the world. With such a huge range of applications available to us, we can do better.

What the EBOSS study showed was that BIM was being used in the design stages of construction the majority of the time. When it came to structural analysis, however, BIM was used in only 30% of cases and in less than 10% for evaluating a building's energy use and sustainability.

Yet given that we've all been challenged to build more homes for Kiwis, more affordably, more sustainably and more quickly, it makes sense for BIM to become the industry standard.

Taking BIM further

One of Ignite's latest projects, The Country Club, Huapai, in northwest Auckland, illustrates how our partners used BIM collaboratively in a way that goes beyond mere design. We used modelling to plan the overall 6-hectare development of aged care apartments and townhouses, working out the ➤

best locations for each building according to the slope of the site and building design.

We used the software in tandem with virtual reality, enabling contractors and consultants to walk through the buildings in BIM so they could examine the facility and request changes before any dirt was dug.

Interactive capacity a big plus

As an architect, this interactive element is one of the key benefits to using BIM, enabling us to isolate issues and speed up the whole building process. Because I'm able to show people a 3D model rather than a series of flat paper drawings, BIM helps ensure they understand what they're getting.

This makes communication with clients and stakeholders so much easier and increases their engagement with the project. It also helps make the final product better, because it gives everyone an opportunity to give feedback and because it's much easier to spot any problems in 3D.

Despite resistance from some clients, this can save them money, even including initially higher costs, as clear communication means there are fewer - if any - variations required once the build process begins. We've also found it helps highlight potential hazards to contractors, minimising any incidents on site.

Optimising building placement

It's also been exciting to implement a city information modelling (CIM) process at Huapai, which shows us the best placement of buildings on the site to suit the roads and footpaths required. The model can instantly show what any population changes would mean for building requirements.

With CIM, we could easily expand the projections to include a wide range of buildings for a much bigger population, including commercial and retail areas, and instantly receive information on all the amenities from infrastructure and parks to parking spaces this would require. Once all of us are using BIM, scaling up from planning buildings to planning whole cities becomes much easier.

BIM was used to monitor design costs at Huapai.

However, BIM has even wider applications than that. The whole idea of the technology is that value is added at every stage of the building process. The same 3D model gets passed on and used by contractors for site planning. This includes giving expected build completion times for various elements (the 4D phase) and costs such as initial materials. Expected running costs are added by quantity surveyors (the 5D phase), as we did very early on at The Country Club.

The 6D stage allows for recommendations to help maximise efficiency and lower costs after the building is completed.

Using BIM for cost management

At Huapai, Ignite and its partners have used BIM to not only plan the development but also to take it the next step, projecting and monitoring costs throughout the design phases. The files Ignite created were used by our quantity surveying partner Jacobs to allow them to create a much more accurate cost estimate.

During construction, we'll be able to ensure everyone is kept informed of any changes and that the budget is on track. This is something we should be doing more of in New Zealand, moving past the 3D stage towards making the entire life cycle of our buildings more sustainable and cost-effective.

Admittedly, it does take time and effort to become proficient, which can be a barrier for busy contractors. Industry wide, there is a skills gap between younger practitioners who've trained in the software and older professionals.

BIM will be essential

However, we've found the effort pays dividends in client satisfaction and time saved, and I'm confident that it's simply a matter of time before BIM is a natural part of the construction process. Technology is changing fast, and no part of the construction industry will be unaffected.

It's essential that we provide ourselves with the skills to stay ahead and remain competitive, or we risk losing contracts to those who have. In an increasingly global world, that's more important than ever.