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BIM AND SECURITY

By Simon Hensworth

Imagine if you knew all the security issues a building would suffer during its entire lifespan before you even start to build. You could design these issues out before they ever became issues. Well, the ability to do this is now closer than ever. Building Information Modeling (BIM) which uses a 3D format to design buildings is becoming more widely used as designers and engineers recognise the advantages and efficiencies it produces. With this wider use comes new advantages for Security design.

BIM

BIM stands for Building Information Modeling. It generally uses software such as Revit to produce a 3D virtual model of a building in place of the typical 2D plans used in conventional building Architectural and Building Services design.

Whilst the actual virtual building model is designed in 3D, BIM is often described as being a 6D system,

where the fourth dimension represents time, the fifth dimension being cost and sixth dimension being lifecycle. This enables efficiencies in the planning of the facility in terms of its overall design staging and associated costing.

Whilst it has been suggested that the concept of BIM has been around as early as the 1970's, the first implementation of BIM (in its infant stages) was not



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pioneered until the late 1980's. It is not until recently, due to advances in IT and new software available that BIM has recently escalated into a new boom period.

Constructing a 3D virtual model of a building generally follows the same construction process as constructing the actual 3D building in real life. Initially, pads and footings are designed and modelled, followed by walls, roofs, infrastructure, services, right down to the final fittings and furnishings. 3D representations of building infrastructure, services, furnishings and fittings are all modelled using accurate real life dimensions and can even include manufacturers' details for specific equipment and technologies.

This provides a realistic preview of the building process and potential issues that may arise.

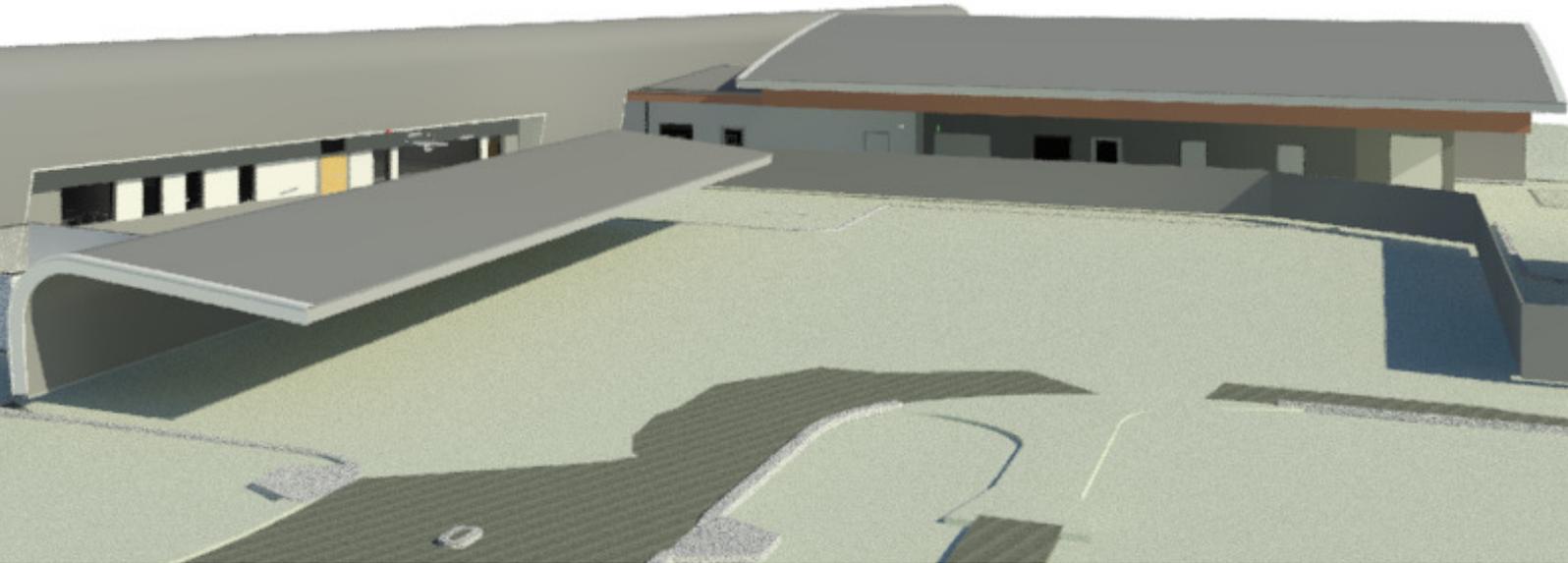
The outcome is a perfect 3D virtual model representing the final finished building.

ADVANTAGES

ETC recently used BIM to design and document the Electrical and Security design for the Onslow Health Service. The use of the 3D modelling assisted in meeting a number of challenges including spatial constraints for services, and early assessment of security considerations.

One of the greatest advantages of BIM is the enhanced ability to visualise the finished building. This allows the building owner to see an almost perfect representation of the finished product at the design stage.

This is very useful for security design as it provides the ability to select optimum locations for CCTV, and



select specific fields of view (FOV) for each camera at the design stage.

This also allows security inspections and CPTED (Crime Prevention Through Environmental Design) reviews at the design stage using the model, so that design elements that may offer opportunities for crime or unwanted behaviour can be identified and mitigated early in the design process.

The enhanced visualisation of a 3D model also assists in communication of potential security issues to the building owner. For example, climb points and natural ladders that may allow intruders to climb the building or access points that may be used which could put people in danger are easier to visualise and demonstrate on a 3D model than they are on a 2D plan.

The 3D model allows more advanced consideration and assessment of the spatial relationships in and around the building and analysis of lighting for sustainable design purposes.

The 3D model can be designed concurrently by all disciplines which assists in the early identification of clashes in services.

All information making up the model is a structured database. Information can be scheduled to enable the extraction of quantities, and materials/equipment can be easily extracted from the model for pricing purposes.

Builders are provided with far more detailed and specific information that provides efficiencies in construction. For example, a builder can have building elements manufactured to the exact dimensions required to save work on site.

The 3D design assists in maximising the transfer of information from the design team to the construction team and on to the end user.

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The BIM could be used downstream by an end user to go back and reference elements of the building throughout its design lifecycle. For example, if extensions are required to security systems, rather than a building operator search through documentation, or have technicians inspect conduit runs through the building, the BIM will show specific details of what exists and where it is located.

Future advantages of BIM are its potential to be used for 3D printing of buildings.

END NOTE

Designing in 3D has already started to supersede traditional 2D design methods, and the efficiencies and advantages it offers is sure to accelerate it as a preferred design method. BIM's early advantages have already started to include enhancements for Security design and as BIM evolves and becomes the design standard, it is sure to offer even greater potential to safety and crime prevention.

NOTE

Before undertaking any activity related to this article, it is recommended you consult a Security Professional licensed in your State.

Some information from this article has been referenced from: http://en.wikipedia.org/wiki/Building_Information_Modeling

ABOUT THE AUTHOR

Simon is a Senior Security Professional with Engineering Technology Consultants – ETC. Simon has over 14 years' experience in providing security advice, design and consultancy services for a range of clients with major assets in Western Australia. He is a registered Security Professional on the Australasian Security Professionals Registry and one of 10 CPTED practitioners certified by the International Crime Prevention Through Environmental Design Association (ICA), worldwide. Simon is involved in all aspects of Security Management, security design and documentation, CPTED and promoting Security Awareness.

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