

**A layman's guide to
Building Information
Management (BIM) software and
the advantages of its use**

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Introduction

This brief article aims to cut through all the jargon surrounding BIM, highlight its key advantages and understand how it has evolved to become as significant to the building services industry as it is today.

Building Information Modelling (BIM) is a recent concept. The increasing power of computers, the internet and the evolution of 3D computer software packages have enabled its creation. Differing meanings have been attached to the abbreviation BIM, some say **Building Information Modelling**, others define it as **Building Information Management**, however, the concept actually combines elements of both. Architectural areas of activity such as the structure and surrounding topology have been developed and integrated into the BIM model as have the Mechanical, Electrical and Plumbing (MEP) services.

Outside Influences

There have been many reports on the UK construction industry over the years, with one specific report carried out in 1994 by Sir Michael Lathan being the most famous. Contained within the report the industry is described with words such as *ineffective, adversarial* and *fragmented*.

As the report was government commissioned it is easy to understand that for a period of time the UK Government and, at a guess, many governments in other countries have been looking for a leaner method by which construction practices may be carried out. The UK Government now has a relatively new tool to add to its arsenal, that is BIM; in 2011 the UK published a paper called The Building Information Working Party Strategy Paper. It required that by 2016, all government projects at a value above £5 million are to be BIM collaboratively managed (BIM task group 2013). Building services are clearly part of that construction process, leading to the assimilation of building services into the BIM concept.

BIM Levels

Levels of UK BIM integration already exist, given below are their accepted descriptions.

Level 0

CAD, likely 2D, with communications and collaborations via electronic sources and paper in an unmanaged environment, the majority of commercial projects are still at this level.

Level 1

CAD, in either 2D or 3D which is managed, used to give a visual image to say a client, used to check clashes visually and may be used to reduce waste costs and conflicts.

Level 2

At this level, collaboration by all parties of the design team is required. The philosophy at this level is that of a collaboratively working concept. 3D models are used which does not necessarily mean working from one model, but members may work from separate models. There shall be use of the models by other parties, for example contractors, and at this level construction programmes may be incorporated.

Level 3

The model itself will be held on a central server where the access to that server by the project teams will be enabled, this may be thought of as iBIM with 'i' standing for integrated.

Computer Software

Integral to the success of BIM, is investment in the correct software package(s) to enable realisation of the concept. Many software companies have developed software packages which may be regarded as an evolving entity, the global software house Autodesk is one of the largest. Autodesk has many products such as AutoCAD, which is a 2D package along with their Revit package (more details to follow) which produces a 3D model at its core. There are associated third party software packages such as Integrated Environmental Solutions (IES) modelling package, developed as a stand-alone application or alternatively can be plugged into the Revit model or another software model. Plug-in is an industry term which allows differing packages produced by differing software houses to work with other parties' software packages.

Development

Revit is more than a 3D drawing package and contained within it is the ability to do much more. With Revit we can produce equipment schedules, render life-like images and conduct dynamic calculations, e.g. Ductwork pressure losses which relate to the design element. There are follow-on uses after the construction phase which leads the way for Revit to be utilised for maintenance tasks, referencing for fitted elements or components. Although there is more than one manufacturer of BIM software, Autodesk's Revit package appears to be the most adopted package in the UK.

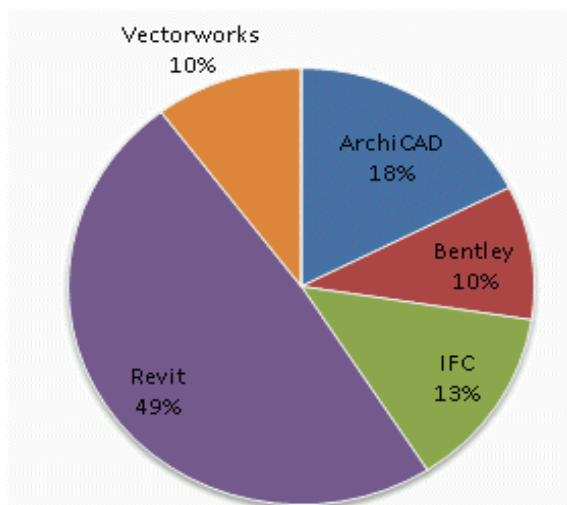


Figure 1: Comparison of BIM manufacturers' software in the UK market place (*Building Design Online, Anne Winston 2013*)

Revit may be regarded as a central hub from which other software packages such as Computational Fluid Dynamic (CFD) analysis packages or Integrated Energy Solutions (IES) may 'plug in'. Thermal Analysis Tool (TAS) may also plug in. Not forgetting the likes of Amtech, Cadduct and Autodesk's Navisworks, it is worth noting that not all software packages offer the ability to simply plug in, a further third party package may be required.

UK Building Regulations requires, under certain circumstances, the production of Energy Performance Certificates (EPC). Simply by the use of the Revit platform and plug in software, these certificates can now be quickly produced, though some legislative criteria will still need to be met.

Co-ordination

The co-ordination in restricted spaces can be modelled to ensure their fit. The information sharing ability and the cost benefits can be realised by thermal modelling, early identification of Health and Safety issues, reducing waste and the speedy production of cost estimates by designers to create a streamlined process.

Co-ordination can also be realised with those parties outside of model design. For example, in partnership with local council planning groups or with adjacent building owners who may have reservations over the buildings aesthetics.

Clash detection simply means that two or more services, for example MEP services, may not share the same space. If compared to a 2D design this error may not be apparent until construction is underway which would be costly in terms of time and money. With the use of clash detection within software packages, conflict can be reduced and a streamlined installation can be carried out.

Summary

BIM and Revit, coupled with the co-ordination it offers can create some extra costs. The costs are gathered mainly at the project outset and an early evaluation should be sought to maximise the benefits from using BIM/Revit.

This said, there are many apparent benefits to be had. As people become more familiar with the Revit software and other packages, integrating them into aspects of their design and overcoming difficult design aspects, the use of Revit and other packages will undeniably become more popular.

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