



Investors Report

Building Information Modelling (BIM)

Building Information Modelling enters mainstream UK construction market

Building Information Modelling (BIM) is poised to become a key means to deliver increased productivity and reduced risk within the construction sector. A number of major players have declared their intention to commence the roll-out of BIM technologies across their major project portfolios. This move will increasingly encourage successive supply-chain organisations and professionals to develop their own capability to work with the technology in order to maintain their market position or gain further competitive advantage. Serial construction clients are also beginning to awaken to BIM as a powerful post-occupancy management tool and this facility within BIM is also likely to drive demand. BIM is a major enabler for greater productivity, risk management, improved margins and sustainability as the construction sector focuses on a low-carbon future.

The Problem: Productivity in the UK market

With the tightening of the market, both in the public and the private sector, we can expect to see greater competition from the supply base, matched by a desire among clients for better value. This position will extend far beyond the short term, and every opportunity is being reviewed to find ways that will optimise productivity and efficiency.

When the UK and US construction markets are compared with other industry sectors, using indices of productivity (figs 1 and 2), it is apparent that construction has failed to maintain parity with these sectors – and the divergence is increasing year on year.

There is no single cause for this. But if we look at the retail, automotive, electronics and aerospace industries, transformation in these sectors could have only come about through the adoption and continuous development of modern processes and technology. If you take, for example, the data-rich retail market, accurate information is routinely used to predict and improve responses to client requirements. The construction industry, by contrast, captures and retains little data about the assets it delivers and operates. What data the sector does capture is rarely sufficiently analysed to allow performance on the existing project – or delivery of the next – to be improved. Building Information Modelling seeks to bring to construction and the built environment a mechanism and an opportunity to achieve sustained transformation. Early adopters are beginning to deliver tangible benefits to themselves and their clients and have demonstrated that BIM is a powerful tool to reverse the productivity trend.

Lean, green and clean

The market continues to respond to the green agenda in all its forms, but current processes are almost always carried out in isolation. The built environment is one of the nation's largest polluters after transport and power generation, and an integrated approach using BIM data will ensure that assets can be delivered and maintained in the cleanest, leanest way possible.

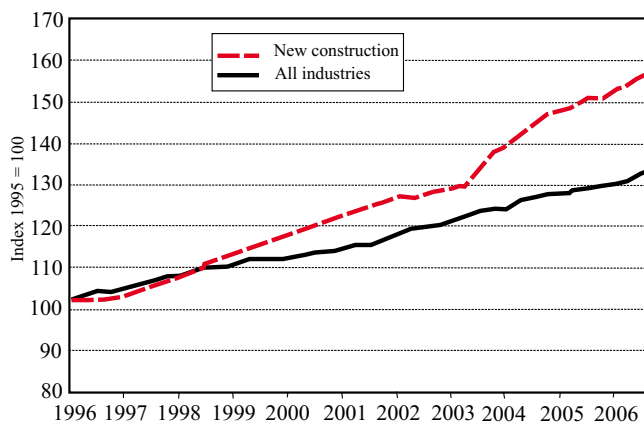


Figure 1 UK output price index (BERR Construction Statistics 2007)

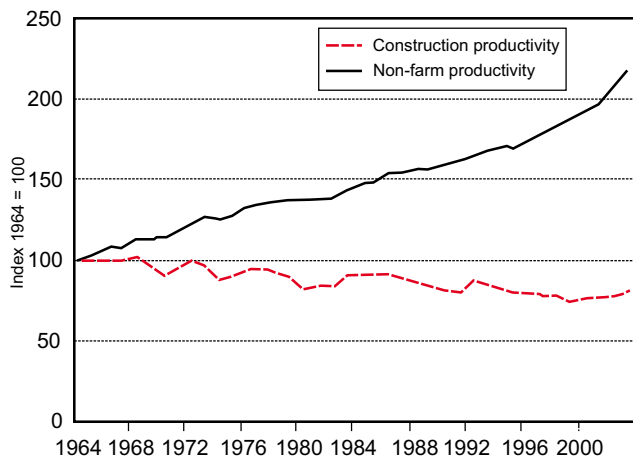


Figure 2 US construction and non-farm productivity index (U.S. Bureau of Labor Statistics 2007)

BIM... At a glance

Key Benefits

- Early cost certainty
- Reduced delivery costs
- Reduced operational costs
- Green performance
- Reduced risk
- Predictable planning

Key Projects

- Palace Exchange, Enfield
- Festival Place, Basingstoke
- Endeavour House, Stansted
- Terminal 5, Heathrow
- Portcullis House, London
- St. Bart's Hospital, London

Early Adopters

- Scott Wilson Group
- BDP
- BAA
- Laing O'Rourke
- Skanska
- Arup
- HOK

References

- BS 1192:2007
- Avanti BIM Guide
- The Business Value of BIM – McGraw-Hill, 2009
- Low Carbon Construction – BIS, March 2010
- Strategy for Sustainable Construction – BIS, Sept 2009

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More about BIM – Free download

- [Constructing the Business Case: Building Information Modelling](http://shop.bsigroup.com/bim)
- <http://shop.bsigroup.com/bim>

What is Building Information Modelling?

Building Information Modelling (BIM) is the process of generating and managing information about a building during its entire life cycle.

BIM is a suite of technologies and processes that integrate to form the 'system' at the heart of which is a component-based 3D representation of each building element; this supersedes traditional design tools currently in use. Each component is generated from a product library and has embedded information about the product and its placement, material, specification, fire rating, U-value, fittings, finishes, costs, 'carbon content' and any special requirements, which is stored in the system. As the design progresses, so the integrated information becomes more valuable. Sophisticated applications and clash detection can rapidly identify issues which can be designed out at an early stage. BIM could be mistaken for a simple design tool but this overlooks the fact that it is the way the system generates interfaces to and uses information from other systems which is fundamental to the delivery of greater benefits. These benefits accrue to the whole supply chain through the collaborative, integrated use of BIM.



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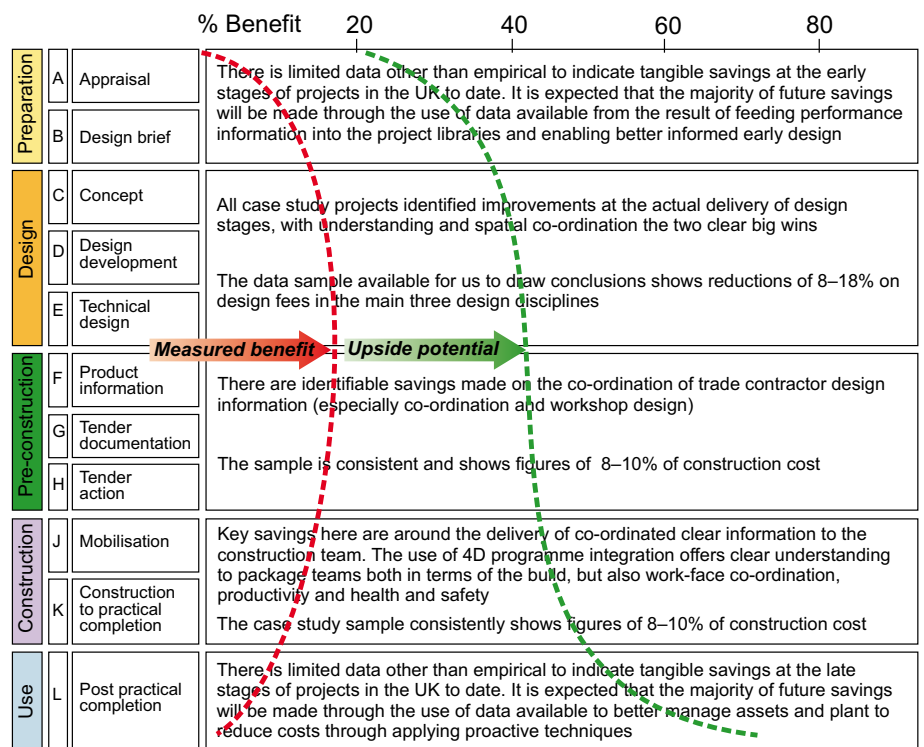
There are parallels between BIM and the EPOS (electronic point of sale) and ERP (enterprise resource planning) systems ubiquitously found in the retail sector. There is a clear interface between BIM and organisational corporate systems – including those dealing with procurement, finance and supply chain performance. As the graphic (above right) shows, BIM sits at the heart of an information web which includes systems directly attributed to design, construction and those business support systems which are used to ensure overall efficient asset and corporate performance.

Why Should I Consider BIM?

There is some published commercial research and data gathered from case studies. The case studies mentioned as 'key projects' in the right-hand panel on the previous page have been summarised in the graph (right).

The red plot indicates the average saving of projects available for measurement to date, with the green plot indicating potential benefits expected by the early adopter community.

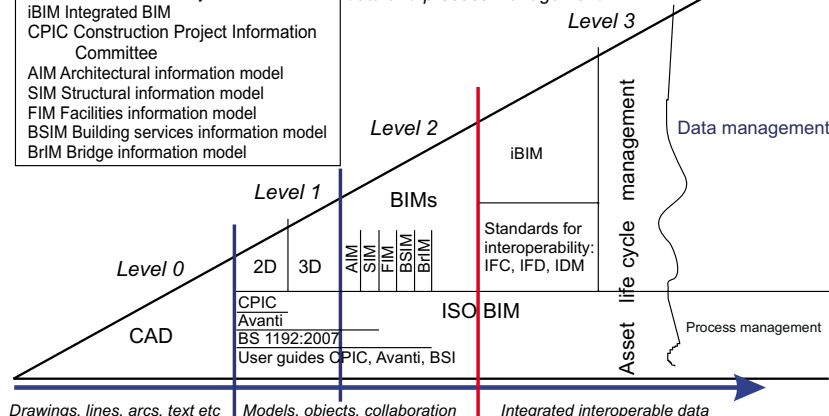
Most of the data covered the design, pre-construction and construction stages. There were clear wins in design understanding, spatial and design co-ordination and 4D programme integration. Benefits post construction have still to be measured. Clearly, this demonstrates considerable upside potential, especially when the processes are applied to the entire project life cycle through to facilities management. These benefits increase further year on year, as around 80% of an asset's cost is incurred during its operational phase. Whilst our case studies have focused on monetary benefits, studies are ongoing to establish similar relationships for carbon.



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- Key**
- IFC Industry Foundation Classes
 - IFD International Framework Dictionary
 - IDM Information Delivery Manual
 - iBIM Integrated BIM
 - CPIC Construction Project Information Committee
 - AIM Architectural information model
 - SIM Structural information model
 - FIM Facilities information model
 - BSIM Building services information model
 - BRIM Bridge information model

Moving up through the levels of technology use leads to seamless working and effective data and process management



Source: Bew and Richards, 2008

Evolution Not Revolution

As this illustration shows, BIM continues to develop. Clearly, not all businesses will adopt systems and technologies at the same rate. However, just like organisations in the retail sector before them, BIM adopters will need to go through a managed process of change which encompasses not only their internal organisation but also the way they interface with their external supply-base and clients. The majority of the UK market is still working with Level 1 processes, and the best in class are experiencing significant benefits by moving to Level 2. It is clear that organisations adopting BIM now will be those most likely to capitalise on this advantage as the market improves.