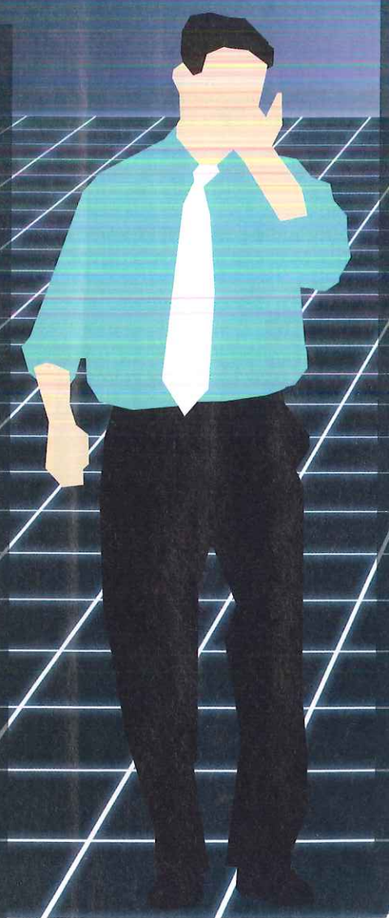
THE USE OF FORCE

Building information modelling may make everything better, but most firms don't want to use it. But that might change now the government plans to make it compulsory on all public projects. **Stephen Kennett** reports



Not many technologies can point to a global financial meltdown as their saviour. But building information modelling just might.

Earlier this month Paul Morrell, the government's chief construction adviser and the man tasked with improving the return on taxpayers' investment, indicated that the government intended to adopt building information modelling, or BIM, for the procurement and management of public assets. Morrell is convinced the technology could unlock new ways of working that will reduce cost and add long-term value to the development and management of public sector buildings.

The reasoning is simple. At the heart of BIM is a digital model of the building in which all the information on a project is stored. By giving everyone involved access to this model, information can be readily updated, shared and interrogated, streamlining the whole process and cutting down on errors. The benefits are well documented: at Heathrow Terminal 5 it shaved £210m off the project costs alone. Despite this, its uptake in the industry has been minimal, partly because of the seismic change in culture that would be required.

However, the UK wouldn't be the first to make it a requirement. In 2007 Finland and Denmark required BIM to be used on all public sector projects, while two of the largest public asset owners in the US, the US Coast Guard and the General Services Administration, require BIM to be used for certain functions.

To help establish BIM on public projects, a task group has been put together to draw a route map.

Mark Bew, who is heading the group, says the aim is to phase in uptake over a five-year period. Because BIM isn't a mature technology yet in the UK, the level to which it will be required on projects will reflect the ability of the industry. However, he adds that those organisations adopting BIM now will be the most likely to capitalise. Bew says the government is looking for pilot projects, and in March next year the task group will report to the Construction Clients Board – those responsible for major government construction programmes – which will mark the beginning of a commitment to a programme of transformation.

If Morrell's plan is to work though, the UK construction industry is going to have to go through a steep learning curve. A survey conducted this year by McGraw Hill on BIM uptake revealed that a little over a third of the industry had adopted it. This might sound reasonable, but the figure includes a wave of early adopters who began using it more than five years ago. Since then uptake has been flat. Compare this with the situation in North America, where most BIM adoption has occurred in the past three years and already outstrips uptake in western Europe.

What the survey also revealed is the extent to which BIM is being used. Although 60% of respondents in the survey classed themselves as frequent users, meaning they use it on at least 30% of projects, the figure for contractors was a dismal 11%, putting them firmly in the catch-up class.

Added to this is the fact that very few users are fully exploiting the potential of BIM. In its purest form it can be used for a project from cradle to grave – everything from checking planning regulations through to design and construction, facilities management and even decommissioning and demolition. However, Malcolm Stagg of contractor Skanska doubts there is a single company in the world using it to this extent. More common is the decision by project team members to build models for their individual needs rather than altering or adding to an existing model. This mirrors the traditional approach and is a far cry from the nirvana of a fully collaborative, single-model tool.

To gauge how well prepared the industry is for the transformation to BIM, we assess what the likely impact is for the individual members of the design team.

The client

You would imagine that if BIM promises greater cost certainty, improved quality, less risk and quicker delivery, clients would be screaming out for it. But, ironically, the number one reason given in the recent McGraw Hill report for not using it is because clients aren't asking for it. David King of architect HOK – which has been using BIM on all its projects since 2009 – agrees, saying resistance has largely been from clients and project managers who aren't involved with the day-to-day tasks of construction and so aren't familiar or don't understand the benefits.

Clients are in the best position to lead the adoption of BIM and if the government takes the lead, the private sector will inevitably follow. But what does this mean for competitive tendering if, at the early stage of take-up, there aren't enough practitioners out there using it? Richard McWilliams, director of research development and innovation at Capita Symonds, doesn't believe this will be a problem on medium-to-large projects. Where he foresees a problem is at the smaller end of the scale with projects of about £1m. "If it is a criterion of a pre-qualification questionnaire, it could end up filtering out local firms perfectly capable of doing the work who just don't have the experience of using BIM," says McWilliams.

There's also the question of fees. A decade ago one of the failures of BIM was that people wanted to charge more for using it on a project, but today it's accepted that the benefits should pay for themselves. However, what will probably need revisiting is the fee profile – who's paid what and when – because of the shift in information delivery.

Structural and building services engineers

When BIM first came on the scene, this was the group in the vanguard. The reason is simple – BIM can reduce conflicts during construction through the use of clash detection, minimise design changes and reduce the number of requests for information, which are a drain on time and cost money. There is also the potential to use BIM for carrying out thermal and daylighting analysis.

The big concern for engineers is the upfront cost of switching to BIM, which includes buying the software, upgrading hardware and training. There are also the technical hurdles of compatibility between the different software packages on the market. ©

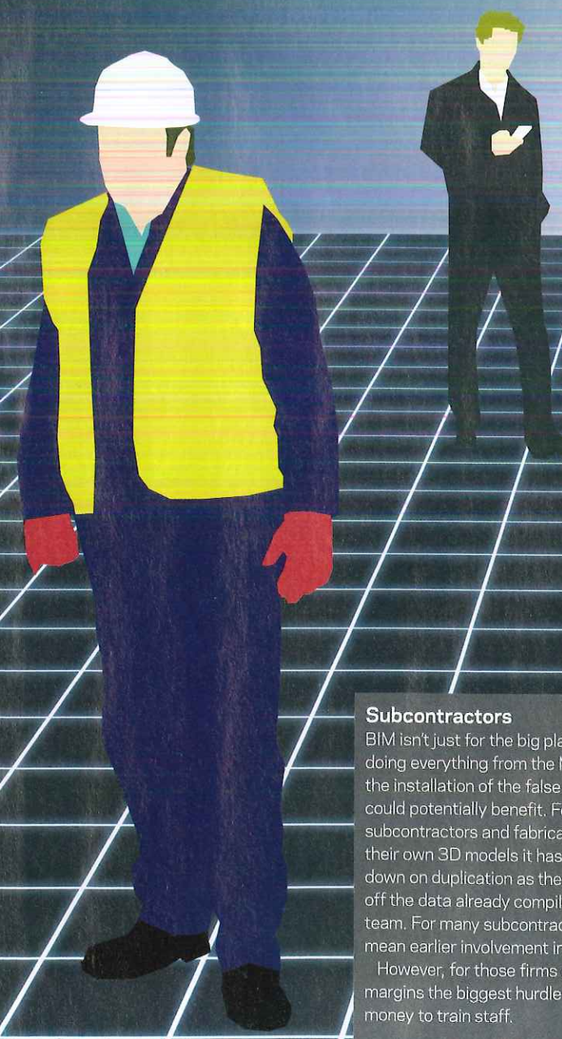
Cost consultants

It has been said that the introduction of BIM, with its ability to automate tasks such as taking quantities and schedules off drawings, could sound the death knell for the QS. This is wide of the mark, but the role of the QS could be transformed. Today's fragmented use of BIM and the fact that QSs don't create the initial model makes it difficult for them to take advantage of its rich data. However, if it does become more widespread and with the right skills and tools, the task of gathering information should be much slicker, giving more time for providing feedback to the design team and adding value through, for example, advice on specification, installation and scheduling.

Architects

For architects the attraction of BIM might have less to do with its potential for collaboration and more to do with the benefits of visualising projects and engaging clients. The main barrier, as with engineers, is the cost of investing in the software and hardware, which is a real concern given the collapsing profits experienced by many firms. Architects will also need to get used to working with modelling programmes that are more sophisticated than many of the current drawing packages.

Since 2009 architect HOK has modelled all its projects using Revit – Autodesk's 3D design tool. David King says: "This is the way we want to work as it flushes out design issues and provides feedback much earlier on, but it does require more work upfront." However, he admits that getting the rest of the design team to follow suit can be a struggle.



Main contractors

UK main contractors lag well behind architects and engineers when it comes to embracing BIM, which is strange given that it can reduce project risk and increase productivity. The reason is partly down to cost. According to the McGraw Hill study, contractors in western Europe perceive a low return on investment, with 40% expecting either only to break even or lose money by adopting the technology.

But this isn't everyone's view. Laing O'Rourke is driving the use of BIM and so too is Skanska which, since the end of 2008, has had a mandate across its business to use it on all projects where it is involved in the design.

Skanska's Malcolm Stagg says a lot of people don't believe the benefits it can bring or understand what is needed to successfully roll it out in a company. "You need a plan from the start – it can't be an afterthought," he says.

A high priority for contractors is training. This isn't just in the use of the software, but also in the collaborative approach and the delivery of information at different stages of the project.

A key area where BIM can help contractors is at the bidding stage. The 3D model can be used for walkthrough demonstrations to the client and, by adding a fourth dimension of time, show how the build will progress. It can also help align scheduling and budget control, as well as reduce programme time.

Subcontractors

BIM isn't just for the big players. Subcontractors doing everything from the M&E fit-out through to the installation of the false ceilings and flooring could potentially benefit. For the larger subcontractors and fabricators that already build their own 3D models it has the potential to cut down on duplication as they will be able to work off the data already compiled by the design team. For many subcontractors it could also mean earlier involvement in schemes.

However, for those firms operating on tight margins the biggest hurdle will be finding the money to train staff.