BIM challenge: what next?

Industry pioneers met to debate how to build on the growing momentum behind BIM adoption and ways to tackle the issues of collaboration and education that stand in the technology's way

BIM
KATIE BARKER

How can building information modelling help us build better buildings and infrastructure?

This is a question that covers technology, asset management and processes, but it also requires the construction industry to fundamentally rethink its culture and relationships.

As the BIM debate gets more sophisticated and the economy shows signs of recovery, the time is right for the industry to begin this rethink, ask challenging questions and make those changes to move forward.

These were some of the themes debated during a roundtable debate hosted by *Construction News* in association with IFS.

The discussion, over dinner at the Gherkin, began with an open question to the assembled BIM specialists as to what they understand and mean by BIM.

What is BIM?

"BIM means something different to different people," said Mace head of BIM **David Philp**. "It's a metaphor for industry change; for me it's about collaboration and culture. We talk about technology but it is a human endeavour.

"It's also about better use of data right across the asset lifecycle and creating a more sustainable supply chain."

DAVID PHILP
HEAD OF BIM
MACE

"BIM is a metaphor for industry change; for me it's about collaboration and culture"

Because the term can be interpreted broadly, BIM was also seen as a catalyst for innovation and industry change.

"It's a bit of a Trojan horse to get innovation into the conversation about where investment should be," said Balfour Beatty principal BIM integrator **Neil Thompson**.

"Construction is traditionally low on its investment in innovation, and we need something to come along and help push that up the agenda."

Instead of seeing the different interpretations and broad definition of BIM as a negative, this was viewed as one of its strengths. "BIM should be the coat hook on which you hang a lot of different things," said Bryden Wood director **Jaimie Johnston**.

"We've moved on from trying to define exactly what BIM is to using it as an agent for change – and that is the key."

Laing O'Rourke Construction South sector leader for science and research **Spencer Baber** agreed. "BIM is a very generic expression but to try to define it might stifle innovation. It does mean different things to different people and organisations, but I think that should be encouraged."

JAIMIE JOHNSTON
DIRECTOR
BRYDEN WOOD

"We've moved on from trying to define what BIM is to using it as an agent for change"

A more efficient way

A recurring theme in the discussion was the link between BIM and efficiencies – it should help us build better, more efficient buildings while also making working through the supply chain more efficient.

"Using BIM has allowed us to communicate better with FM teams as engineers," said **Steven Hale**, director at consulting engineers SME Crofton Design.

"All of our engineers design into the model – we don't have a separate BIM team.

"They can take that away to the client's office and walk our clients through it so we can make design changes early.

"It allows us to articulate our information in a way we have previously struggled to do."

But using BIM alone is not enough to drive these efficiencies; it's also about cultural and process change. "Lots of people think BIM is the next generation of software that sits in the CAD department while engineers carry on doing what they've always done," said NG Bailey head of design and BIM development **Paul Marsland**.

"But it's actually about changing the process, otherwise you're just creating more processes. You can create the perfect BIM model but if you've still done things in a traditional way then you haven't made any efficiencies."

PAUL MARSLAND
HEAD OF DESIGN AND BIM DEVELOPMENT
NG BAILEY

"It's actually about changing the process, otherwise you're just creating more processes"

Effective use of data is a big part of making BIM successful, the attendees agreed, but what data we collect, how we manage it and how we share it needed addressing.

"We're striving for more perfect and useful information and if we move towards that it creates the agent for change that will eliminate the more adversarial bit of the industry and encourage collaboration," said David Miller Architects owner **David Miller**.

But does perfect information exist? "Every time that we do something we have to put an unrecoverable cost on checking that information in a world of perfect information," **Mr Thompson** said. "There is another argument that said we'll never be able to get to perfect information."

The availability of information was not the only problem when considering the effective use of data, either. "If you're creating aeroplane engines you're doing that using perfect information, so it is possible to get closer to perfection than we're getting, but our industry is set up differently – we're not striving for that," **Mr Miller** said.

A data-led future

Whether perfect information exists or not, data will undeniably feature prominently in the successful future of construction.

"The biggest challenge is recognising it's a data-led future, knowing what data to capture and how to use it," **Mr Baber** said.

"In my experience, as an industry we have a lot of data but we don't know what to do with it – that's a change in culture for the industry that's about the biggest challenge for me."

"It creates the change that will eliminate the more adversarial bit of the industry"

DAVID MILLER
OWNER
DAVID MILLER ARCHITECTS

But until clients and contractors consider the whole lifecycle of buildings, and record the data accordingly, the industry won't progress further with BIM.

"Is there a responsibility for that?" asked Amec senior BIM specialist **Danny Hope**. "Is there a mechanism to capture that data and ensure it's passed on correctly?" Once we have that data, using it properly was deemed one of the most important aspects of BIM. "This is about information management over the lifecycle," Open Water Consulting director **John Eynon**. "It's about people management, process management and culture.

"As long as you're using that information properly and not reworking it all the time, that's the important bit. Technology helps, but you could be using the back of an envelope as long as you're using the information properly."

2016
Level 2 BIM adoption deadline for central government

Why won't we share?

One major cultural issue in the industry is its adversarial nature, which creates an unwillingness to share data throughout the supply chain. "There are still several methods of procurement that are battling against BIM," said Speller Metcalfe environmental manager and BIM lead **Adrian Speller**. "Often the people who did the original design are not willing to share the BIM information, so that takes away a lot of the efficiencies. They are nervous about sharing it."

Mr Hope agreed: "This opens up questions of trust between the various different disciplines."

But as a new generation joins the industry, is this changing?

"There is a wider cultural shift. The industry is adversarial, so people don't want to give away the model because they think the data will be used against them in some way," **Mr Johnston** said. "But there is a generation coming through asking 'what's the problem with that?' There is a shift coming not just to do with BIM but everyone getting more comfortable with using data."

UK government BIM task group chairman **Mark Bew** said his organisation was trying to encourage this shift.

"A lot of the things we are doing around Level 2 BIM are about getting people talking about data.

"The targets we've set ourselves in the Construction Strategy are life-changing and are not going to get delivered by doing what we've always done. The savings and improvements are not going to come just through BIM; they will come through behaviours, collaboration and all those elements we see in the aerospace and automotive industries."

Making those changes was agreed to be vital to the survival of the industry, not just for the success of BIM within it.

"That has to happen in the construction industry; we either go and make that change or these young people will find a better way to do it and start their own businesses," **Mr Thompson** said.

"The whole landscape of construction will change – some big companies will fail."

This may also affect the way the whole industry does business. "Are the business principles going to continue or disappear? Is this what we should be doing in the future or should we be doing something different?" asked IFS ▶

SPENCER BABER
SECTOR LEADER FOR SCIENCE AND RESEARCH, LAING O'ROURKE CONSTRUCTION SOUTH

"We have a lot of data but we don't know what to do with it – that's a change in culture"

NEIL THOMPSON
PRINCIPAL BIM INTEGRATOR
BALFOUR BEATTY

"We either go and make that change or these young people will find a better way to do it"

ATTENDEES

- **Spencer Baber**, sector leader for science and research, Laing O'Rourke
- **Colin Beaney**, global industry director – energy and utilities, IFS
- **Mark Bew**, chairman, government BIM task group
- **John Eynon**, director, Open Water Consulting
- **Rob Garvey**, lecturer in BIM, University of Wesminster
- **Steven Hale**, director, Crofton Design
- **Danny Hope**, senior BIM specialist, Amec
- **Kenny Ingram**, global industry director – construction and contracting, IFS
- **Jaimie Johnston**, director, Bryden Wood
- **Steve Jolley**, senior director, Bentley Systems
- **Martin Jones**, chief planner, Skanska
- **Anne Kemp**, director for BIM strategy and development, Atkins
- **Paul Marsland**, head of design and BIM development, NG Bailey
- **David Miller**, owner, David Miller Architects
- **José Oliveira**, BIM lead, Mott MacDonald
- **David Philp**, head of BIM, Mace
- **Adrian Speller**, environmental manager and BIM lead, Speller Metcalfe
- **Neil Thompson**, principal BIM integrator, Balfour Beatty
- Chair: **Rebecca Evans**, editor, *Construction News*

global industry director for construction and consulting **Kenny Ingram**.

What drives change?

While the panel were united over the need for change, the factors that will drive that change were perceived as varied and often complex. The energy and carbon agenda was cited as one such driver. "Once people start thinking about operational life rather than initial capital costs, that's what will begin to change the industry," **Mr Eynon** said.

"It will put the right drive in place to force people to adopt this technology, because if they don't they'll go out of business."

"Clients have a key role," **Mr Speller** added. "Working with local authority and public sector clients, we see a very vague understanding of BIM.

"They need to define at the outset what they want, and that they are going to drive the cyclical learning. We can provide the processes and information as companies, but without that wider educated client base, there are some big holes."

It was also vital that clients decided at the outset whether they wanted to use BIM on a project and then engaged with contractors early. "It's about informing clients right at the beginning," said Skanska chief planner **Martin Jones**.

"In our market we try to provide BIM, but when we receive a tender and stage E design there is nowhere to go, and they often want to start the project in a few months' time.

"What are we going to do? Stop the job and go back six months to start the design fresh? To retrofit BIM into the commercial market is extremely difficult."

"What are we going to do? Stop the job and go back six months to start the design fresh?"

MARTIN JONES
CHIEF PLANNER
SKANSKA

MARK BEW
CHAIRMAN
UK GOVERNMENT
BIM TASK GROUP

"The targets are life-changing and won't be delivered by doing what we've always done"

KENNY INGRAM
GLOBAL INDUSTRY
DIRECTOR FOR
CONSTRUCTION AND
CONSULTING, IFS

"Are the business principles going to disappear? Is this what we should be doing"

Some of the responsibility for creating educated clients must lie with contractors and the wider industry, however. "It's how the construction industry articulates its value proposition to clients," **Mr Thompson** said. "It says, 'I'm going to go out and build something'; it doesn't go out and say, 'I can deliver these savings up front'."

But it's also difficult to control the external influences on clients. "It's the advisers; the client is still being advised by people who have plenty of experience but do they have BIM knowledge?" said **Rob Garvey**, a lecturer in BIM at the University of Westminster.

Should the process even be client-led at all? "Clients want more for less, which is another driver, and it's up to the industry to pick up on that," said Bentley Systems senior director **Steve Jolley**. "It's about business change not technology change – the most important thing is data.

"How you manipulate and share the data is crucial. BIM should be seen as something we should be doing to improve the efficiency of the capital and operational supply chain."

The progress that has already been made with clients should not be underestimated. "We're less than two years into a massive change programme," **Mr Bew** said.

"In time those skills and that awareness will increase. And the fact that you can go to a client and have a debate is a massive step forward from where we were two or three years ago."

Atkins director for BIM strategy and development **Anne Kemp** was also positive about the progress the industry is making. "We're on a journey and we're nowhere near completing it. I'm involved with the Highways Agency and the Environment Agency and it really is joining up for whole lifecycle and supply chain. The word is out and starting to gain momentum."

Individual experiences of BIM uptake from the panel also seem to reflect this shift in attitudes and positivity. "I've been surprised how quickly BIM has been adopted in our office," **Mr Hale** said. "I thought we'd be dragging our guys kicking and screaming. We decided two years ago to implement it because we assumed we'd be out of business if we didn't, and I thought it would be hard. But the guys have seen how much easier it is."

20%
Target cost cut for public sector construction

Getting the message out

But not all companies and individuals have been as clear about the benefits of using BIM – both for themselves personally, and for the wider industry. "There is a level of misunderstanding and of feeling threatened which is driving some poor behaviours," **Ms Kemp** said.

"This is going to hold us back if we can't communicate much more clearly. We need to say, 'Hang on in there guys. You might have taken some short-term hits, but in the longer term you will see the benefits'."

Communicating this message to the wider industry was agreed to be one of the major challenges.

"How do we reach 2m people over the next 18 months and get them to understand this and how it applies to their role?" **Mr Eynon** asked. "However much BIM has penetrated the industry, we've barely scratched the surface.

"That is the fundamental challenge. How do you explain that to a 55-year-old bricklayer down the road?"

Making the conversation relevant and personal was one way to address this issue.

"If you can show the 55-year-old bricklayer or your team how

DANNY HOPE
SENIOR BIM SPECIALIST
AMEC

"Is there a mechanism to capture data and ensure it's passed on correctly?"

EXTERNAL LESSONS

Aerospace, automotive and retail were cited as sectors that use data effectively and offer interesting comparisons for construction.

"Until recently, the industry took the attitude that if it ain't broke, don't fix it," Mr Jolley said. "But from a client's perspective, it's important they have a requirement and deliver on that requirement. The reason those industries can do that is those clients know exactly what they want from the outset."

Although both automotive and aerospace use data effectively, there are some elements of those industries construction does not want to emulate. "Look at those two industries – they're down to two vendors, which I think would be bad for us," Mr Bew said.

"There are lots of cars that look different but are essentially the same underneath. The underlying thing that makes that work is data, the reliability of data and the availability of data."

SYNCHRONISED STANDARDS CRUCIAL TO SUCCESS

Developing sharable and suitable BIM standards for the industry is another important step to wider implementation, but assembling those standards is far from easy.

"If it's too complex people won't use them, too simple and it won't function," Mr Bew said. "We need to find a way of funding it so we can have standards that are simple and competent enough. It's not going to happen overnight."

The lack of standards is driving companies to come up with their own, causing further problems. "We're getting tenders where although the documents look similar, everything has to be tweaked," Mr Miller said.

"Why don't we use one standard and feedback to improve it?" Mr Marsland added: "That's the ideal – but you can't get the authors. We're forced to do something bespoke because the standards don't work."

Retail's model may be of use. "The big American companies together over three or four months and came up with standards," Mr Garvey said. "Can we do that?"

"They collaborated over a big issue, and that's exactly what we want," Mr Bew said.

using the technology will make their job easier and more accurate, they're going to buy in quite quickly," **Mr Speller** said.

But without innovation, the level of penetration needed can never be achieved. "It's not a direct conversation with the bricklayer – there is a higher level we need to have the conversation with," **Mr Bew** said.

"There is no precedent, apart from possibly health and safety, where we've achieved that volume of penetration. That's where we need the innovation."

18
Attendees at the roundtable

Encouraging chain innovation

Was this where the SMEs come in? "SMEs make up the vast majority of the industry – is there an opportunity for them to engage with this and ways we can encourage them?" **Mr Miller** asked.

"A lot of innovation happens in SMEs because the culture change can happen quickly, and you can drive through innovation quickly, but you can't drive that through at a tier one contractor quickly.

"If we can find a way of incubating the integrated proposition of small organisations there is a real opportunity there."

Mr Eynon agreed. "It's the SMEs that are going to be the engine room and some of the major contractors will need to watch out in a few years' time."

But without collaboration and trust, the opportunity for companies of any size was limited. "Does size matter?" **Mr Jones** asked.

"The issue is about trust and value; ultimately the end-user wants value but if they are prepared to trust some parties to get in there early, collaborate and work efficiently, that's the bit that's missing.

"We would love to collaborate all of the time but we are not allowed to do so because everything is competitive because there is no trust."

Not everyone on the panel felt that a competitive environment meant that companies couldn't collaborate with their clients and their supply chain, however.

"Competition and collaboration are mutually compatible," **Mr Baber** argued.

"We collaborate every single time – that's not something that just happens because we think there's a difficult tender coming up; that is part of behaviour. If you adopt an approach where you're worried about a contract, you're backing yourself to fail."

What's next?

It's only through open and honest collaboration that the industry will be able to adopt BIM, drive the innovation needed to penetrate the wider industry and instigate change.

"In some industries it's supply chain versus supply chain, it's not contractor versus contractor," **Mr Jolley** said. "They consider the entire tier of delivery and ask, 'Can this supply chain match this supply chain?'

"The innovation happens all the way down, but it's going to be a tier one contractor that derives a supply chain that best works together, and then competes against the supply chain of another tier one contractor. That's where you drive innovation."

Against the backdrop of continually improving market, the panel agreed that the time was right for creating those supply chains.

"We're coming to a point in the market where demand is increasing quite rapidly; it's becoming a sellers' market again," **Mr Hale** said.

"Those tier one contractors that demonstrate good behaviour and have demonstrated good behaviour through the past four years, good tier two and three contractors will begin to want to trade solely with them.

"And those tier one contractors that have demonstrated bad behaviour will slip down the food chain."

But in the end, it all comes back to collaboration, relationships and trust. Is BIM the vehicle to improve these aspects of the industry and change it for the better? BIM cannot work without them, so perhaps cultural change rather than technological change represented the real challenge for the industry.

"We can choose to collaborate and get on and do this or we can choose to make it difficult for ourselves," **Ms Kemp** said.

"We're building up momentum, coverage is a challenge, but if we can just get ourselves over that barometer of enthusiasm and buy in, we will really see change."

ROB GARVEY
LECTURER IN BIM
UNIVERSITY OF WESMINISTER

"Clients are being advised by people with experience, but do they have BIM knowledge?"

STEVE JOLLEY
SENIOR DIRECTOR
BENTLEY SYSTEMS

"Clients want more for less, which is another driver, and it's up to industry to pick up on that"

STEVEN HALE
DIRECTOR
CROFTON DESIGN

"Contractors that have demonstrated bad behaviour in the past will slip down the food chain"

ADRIAN SPELLER
ENVIRONMENTAL MANAGER AND BIM LEAD
SPELLER METCALFE

"If you can show how using BIM will make their job easier, they're going to buy in"

ANNE KEMP
DIRECTOR FOR BIM STRATEGY AND DEVELOPMENT
ATKINS

"We can choose to get on and do this or we can choose to make it difficult for ourselves"