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Your partners for **BIM** success

Mindful **BIM** collaboration

Collaboration is a key element in the successful execution of a BIM project and can help to share information across teams. David Philp, Head of BIM at Mace and the UK BIM Task Group details how BIM can aid collaboration...

Building Information Modelling (BIM) is purported to aid collaborative working. Every conference or symposium marries these two themes together without really unpacking what this relationship looks like. Like BIM, collaboration has different meanings depending on your perspective and what lens you are looking through, indeed the Collins Dictionary defines collaboration as either:

1. The act of working with another or others on a joint project;
2. Something created by working jointly with another or others;
3. The act of cooperating as a traitor.

Most would say that one and two are the most commonly related meanings in the context of our industry, though some I am sure would recognize the third definition as a reality on some projects.

Hopefully we all identify collaboration as a key element in the successful delivery and execution of a project programme and as a lever to help break down silos and successfully share information across teams. The reality, as the author Morten Hansen points out is that "bad collaboration is worse than no collaboration" and that "the goal of collaboration is not collaboration itself, but results." So how can BIM really help us collaborate and deliver better outcomes?

In this author's opinion, the main pedal to ensure successful collaboration in a BIM environment is a clear 'purpose'. High-performing teams are driven by a well-defined purpose (do not confuse this with a vision statement) and if BIM (Level 2) is good at anything it is; a) lots of new acronyms, but also b) defining clear information requirements at all stages of the asset life-cycle.

Level 2 maturity begins with clearly defining the purposes of the model(s) and their uses. These are referred to as the organisational and asset information requirements and are articulated to the supply chain through an Employer's Information Requirement (EIR).

Defined information requirements, defined processes (PAS1192-2 and 3) for information delivery and agreed data exchange standards (BS1192-4 COBie) create a strong foundation for collaboration, and when properly worked through with the entire project team, help create unifying goals. The wise client would also do well to additionally invest in BS 11000 Collaborative Business Relationships which defines roles and responsibilities and supports collaborative decision-making.

Level 2 BIM also ensures that collaboration extends beyond delivery, with the requirement for 'Soft landings' and the requisite for an operational champion to be involved throughout the plan of work for that project – starting with the end in mind and using the model as a basis to visualise and test the lifecycle solution at pre-construction stage. This is a great win in an industry where there is normally a large chasm between the delivery and operational lifecycles.

BIM is data rich in the context of both geometric and alphanumeric data which can be visualized in a 3D, or indeed an immersive environment. In terms of low hanging fruit, BIM allows all stakeholders in a project to clearly understand and explore the project life-cycle – often now assisted by 'gamification' methods and augmented reality (AR) techniques. It is essential however that organisations avoid 'lonely BIM', where one

solitary party sits staring at their exquisite model. Models need to be shared and used as a backdrop for decision making; if you like the modern virtual day camp fire but without marshmallows and bad singing. Projects using BIM should always consider as part of their strategy the creation of physical spaces where collaboration workshops can be undertaken, models reviewed and decisions made with screens such as short throw projectors. These are often referred to as 'big rooms' or Computer Assisted Virtual Environments (CAVEs).

It is also critical that rigor be given to managing information flow between the project stakeholders within the context of a common data environment (CDE) as set out in BS 1192:2007. In addition, the collaborative production of architectural, engineering and construction information Code of Practice, which establishes the outline methodologies for setting up the BIM project cannot be ignored. To exploit collaborative working processes, a common methodology for managing the data produced by, and between all parties, must be used. This should include the naming of data as well as a process for exchanging data. This common data environment is a key component of both level 1 and 2 BIM maturity.

Forms of procurement should also be considered as a lever to encourage collaboration. The Government Construction Strategy trialled the use of procurement routes which sought early contractor engagement. The value of this timely appointment should not be underestimated, however, it is essential that this same strategy be considered in the early engagement of specialist contractors and manufacturers who are key to a joined up data hierarchy. This is as much a cultural change as it is a process change.

Open data standards which allow the transportation of information and support interoperability are also really important to the collaborative

investment we need to ensure that everyone can play on a level field, especially SMEs. This is why the development of COBie and IFC are crucial to ensuring the uptake of BIM across the construction community.

We must also consider the danger of information overload in a collaborative network; it is therefore essential that the right amount of information, to the right level of maturity, at the right time, is established. It is crucial therefore that a well thought out Master Information Delivery Plan (MIDP) is established through a collaborative process before the information exchange process begins.

What we must always remember is that construction is a human endeavour and technology is there to support collaboration and not replace it. Indeed, the biggest danger is that we get bogged down in a technical discussion when BIM is a behavioural change programme more than anything else.

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CADSPEC – Your partner for BIM success

Our customers will tell you that there is much more to us than just consultancy and/or training services. Our way of partnering with organisations to understand their requirements and aspirations stands us out from the rest. It's this that has brought us and our customer's complete BIM success.

Having successfully worked with numerous companies to implement the move to BIM, we now have a highly developed and refined process that can be adapted to the individual needs of each company we partner with.

Experienced support

Our dedicated team of construction experts have years of experience in the industry and have a deep understanding of how it works. Working with experienced AEC professionals provides sector focussed solutions beyond just software and new technology.

We can help you in creating and defining your BIM execution plan with advice and guidance on Autodesk based software, plus training and consultancy across the UK. If you are unsure where to start or what to do, we'll support you every step of the way and ensure you're able to make the most of the significant opportunities that working within a BIM environment brings.

If you would like to explore how Cadspec can help your business grow and become more profitable, please give us a call on 01905 458000, drop us an email at sales@cadspec.co.uk or visit our web site www.cadspec.co.uk

BIM and beyond...

• CADSPEC specialise in CAD software solutions for the construction and manufacturing industries. We provide 1st class consultancy, training & technical support and pride ourselves on our collaborative approach to working with customers as their primary technology partner.

• We are part of the Stanford Marsh Group, the UK's leading provider of large format output devices, consumables & 3D Printing Solutions.

• We have been an Autodesk Gold Partner for over 25 years and have worked in partnership with a number of organisations in developing their BIM strategy resulting in improved efficiency, collaboration and reduced costs.

• Having successfully worked with numerous companies to implement the move to BIM, we now have a highly developed and refined process that can be adapted to the individual needs of each company we partner with.

BIM drivers – Change identified...

1994 Latham Report

  – 30% Reduction

2002 Egan Report

  – 10% Time and Cost
  – 20% Reduction in construction costs

2012 Murphy Report

  – 10 Million Tons construction waste (£1.5 Billion)
  – 50% of carbon from construction processes

Her Majesties Government BIM Strategy

"This Government's four year strategy for BIM implementation will change the dynamics and behaviours of the construction supply chain, unlocking new, more efficient and collaborative ways of working. This whole sector adoption of BIM will put us at the vanguard of a new digital construction era and position the UK to become the world leaders in BIM."

Francis Maude
Minister for the Cabinet Office

BIM in the Private and Public Sector

Building owners and operators are becoming increasingly aware of technology, and given the potential construction cost savings are increasingly starting to stipulate the use of BIM workflows and deliverables, not only for the construction phase, but for the building's on-going life cycle and for forward management of assets.

Not all construction projects will require full BIM, but the 3D model centric approach also delivers lots of benefits, so should not be ignored.

The private sector is forging ahead with BIM adoption, but it is the UK Governments BIM mandate that is really accelerating the adoption of BIM across the UK.

The government's strategy started in mid-2011 following guidance from the Building Information Modelling Task Group and the Construction Industry Council, which produced a comprehensive

Building Information Modelling Working Party Strategy Paper.

The task group brought together expertise from all parties, to drive the wider adoption of BIM technologies and processes across the private and public sectors, and also to assist the construction supply chain (see BIM for manufacturers).

The government's plan is based on a three cornered strategy which clearly spells out the government's action plan:

1) Fully commit to the existing BIM programme to create critical mass.
2) Aim for growth.
3) Help create the future growth by continually developing their capabilities.

BIM is seen by the government as the main tool for them to achieve their own internal cost reduction targets on capital projects of 20% by 2016

BIM is not going away

The rapidly increasing adoption of BIM across the private and public sectors is a clear marker in the sand for the future of BIM. Any doubt that businesses in the construction sector has about BIM should be alleviated, BIM is here to stay.

The most important part of **BIM** is the **I** in the middle. Information is king. In BIM methodology, data is collated, modelled, manipulated and managed, but always with a connection to the object to which data relates. This leads us on to BIM for Manufacturers.

BIM for Manufacturers

Any company that manufactures components for the construction industry is going to be affected by the growing adoption of BIM. The construction supply chain will need to be in a position to deliver BIM ready data as part of their project deliverables.

A whole variety of information should be provided with building components, including graphical and visual information, specification and performance, part, product and manufacturers data. As well as manuals and documentation. However not all this information should go into the object for use within the design model as it is unnecessary and can impact performance.

Whilst participation in BIM projects is not mandatory for manufacturing for construction, given the acceleration of BIM adoption, and the fact that construction products represent about 40% of the UK construction costs; Building Product Manufacturers who do not meet the growing demands of the market could quite quickly experience a diminishing market share.

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The benefits of BIM:

Consider the chart below which is a McGraw Hill report based on a poll of companies that have successfully used BIM on multiple projects. It shows the short term benefits gained.
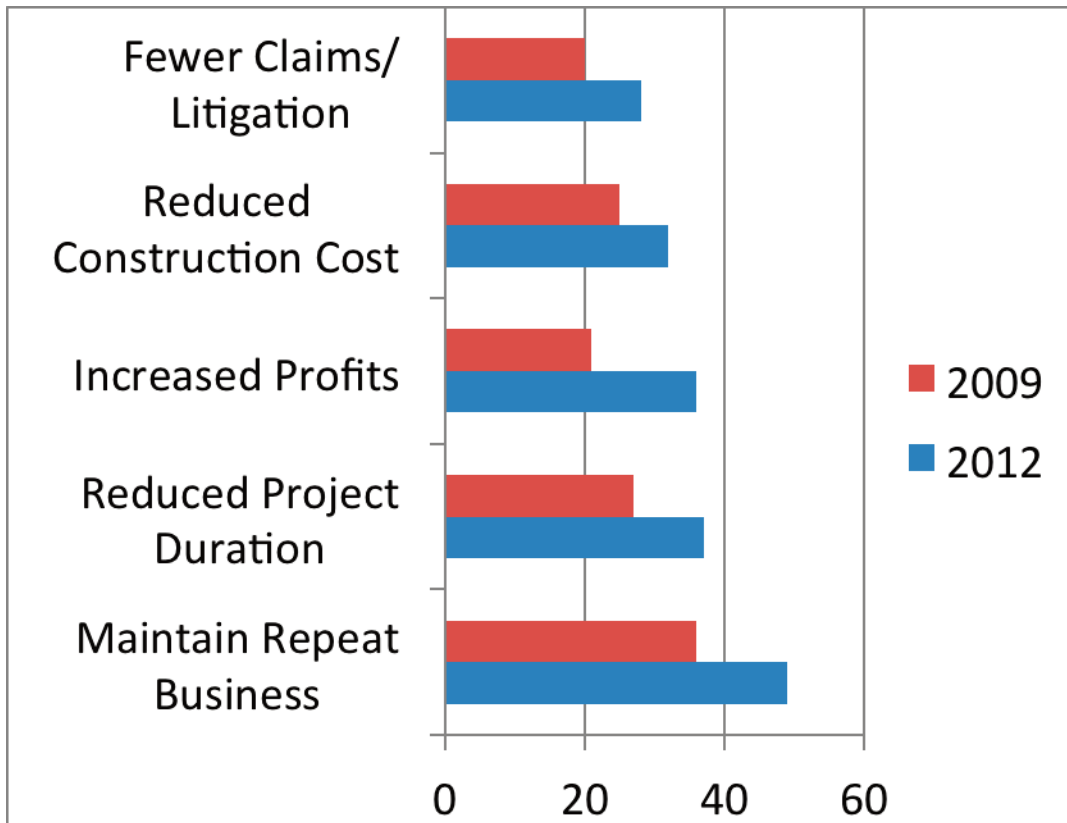
Short-term BIM benefits (2009 & 2012)
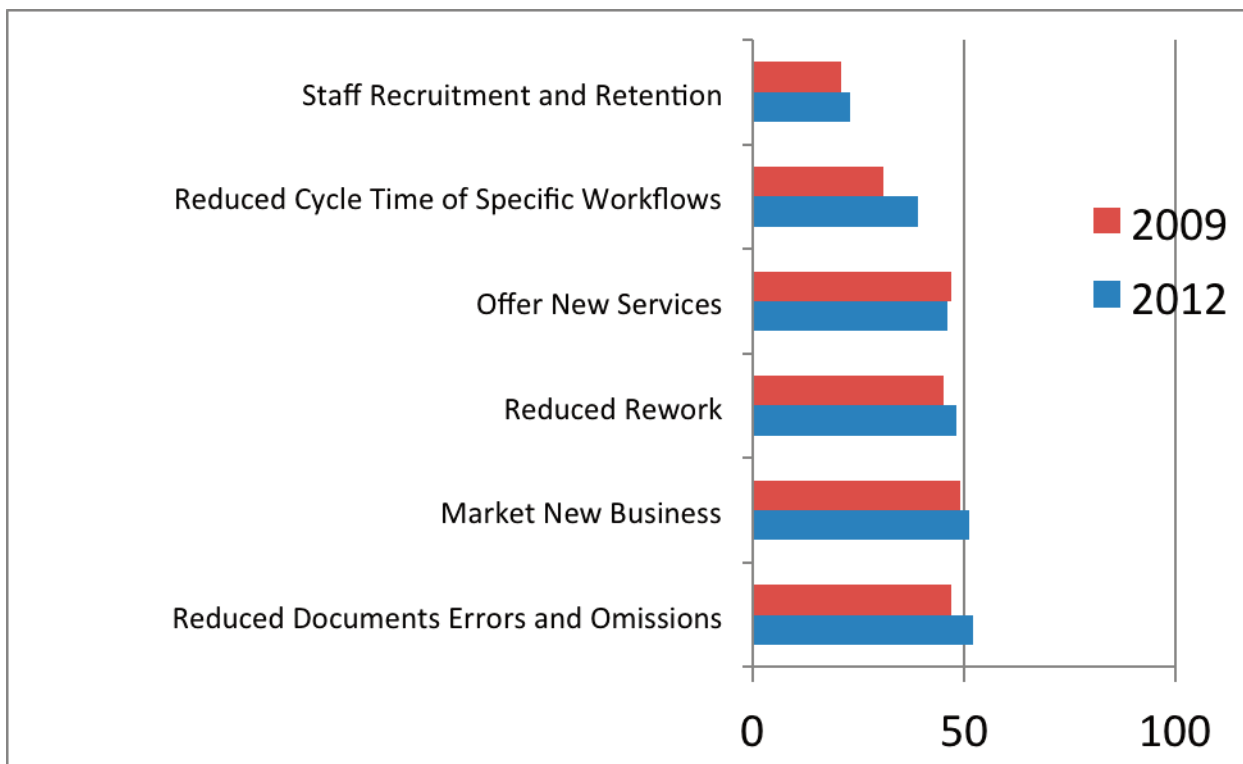
It clearly shows a number of definable benefits for companies using BIM.

1) Staff are motivated to stay with their employers, they want to learn and use new technology and processes, and they continue to be motivated.
2) There is a 30% reduction changing from one workflow to a BIM workflow which increases over time to 40%
3) There is an immediate ability to offer new services to customers, increasing market share and profitability.
4) There is a 45% reduction in rework on BIM projects, saving time and money.
5) Customers are better able to market their services, and win new business.
6) A 50% reduction in documentation errors.

Overall the chart shows immediate gains which increase slightly over time.

Now let's look at the long-term BIM benefits (2009 & 2012)

A horizontal bar chart comparing 2009 and 2012 values across categories: Fewer Claims/Litigation, Reduced Construction Cost, Increased Profits, Reduced Project Duration, Maintain Repeat Business. Legend: 2009 (red), 2012 (blue). X-axis from 0 to 60.

1) There is an immediate 20% reduction in claims and litigation, this improves by over 50% with long term use of BIM.

2) There is an immediate reduction in construction costs of 25%, again over time this improves to 30%, proving as you continue to use BIM your costs reduce.

3) **The BIG one.** Companies using BIM see an increase in profits of 20%, the more they use this process their profitability increases to 35%.

4) Projects take initially 30% less time, this increases to 37% over time. Meaning you are free to take on more work and increase profitability.

5) The ability of any business to maintain repeat business is key to business success, the chart clearly shows that over time your ability to win new business from your existing clients is greatly enhanced using BIM.

Overall, companies that use BIM on their projects can see immediate gains, but the real benefits accrue as they use BIM over a period of time.

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Cadspec BIM services

With demand for BIM compliant projects growing at an increasing rate, it is important to understand where to start and how to go about getting involved in an effective, structured way. In our experience, some companies are going into BIM blind and they simply agree that they can deliver level 2 BIM and sometimes even level 3 on bids when they have no idea what is involved. This is costing real money and business due to their inability to deliver.

Commitment to BIM needs to be fully understood to ensure you are not promising too much and that your entire business is operating collaboratively with a BIM ethos without unnecessary risk. Having successfully worked with numerous companies to implement the move to BIM, we believe there are a number of key steps to follow in developing your implementation plan.

Step 1. Where do we start?

Before we get started we need to understand all of the key elements that will make up the plan. We need to recognise why we are going through the process, how we achieve our objectives and who will be involved.

Here we need to think about the real business benefits of BIM such as:
• Support to complete projects within your specified timeframe.
• Reducing waste and therefore saving costs.
• Increased profits.
• Winning new business.

Step 2. Get to level 2 BIM by 2016

We need to get ahead of the game by planning sooner. The UK Government has set a deadline that all public projects should be BIM compliant by 2016, and our experience tells us that most companies that implement BIM do so across their whole portfolio.

We can support you with this by:
• Working with you to obtain high level buy-in and developing your company implementation plan.
• Reviewing the technology and processes currently being used.
• Advising on IT infrastructure capability and possible upgrade options.
• Supporting you in adjusting your processes to ensure BIM compliance.
• Understanding public indemnity, BIM data – who owns it and who's responsible.

Step 3. Defining what a successful BIM project is

Before we embark on a BIM project, we need to define what a successful BIM project is and we'll work with you to do this. First we should consider how to measure success and agree objectives. We will ensure these are reviewed going forward and work with you to adjust your BIM strategy as we move through this learning process.

Step 4. Professional training

BIM brings diversity to professionals of all disciplines, and sometimes non-CAD users who need to check, communicate and collaborate within a project. We can develop your training programme to embrace all levels within the organisation, ensuring everyone on the project is engaged within the BIM workflow effectively.

Our main courses include:
• Autodesk Revit Architecture
• Autodesk Revit Structure
• Autodesk Revit MEP
• Autodesk Civil 3D
• Autodesk Navisworks for CAD & non CAD users
• BIM Management & Content Creation
• Data management for complete control of document workflow

Which proposal will differentiate you from the competition?
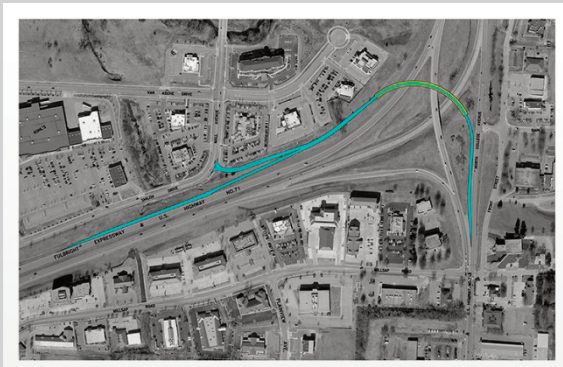
Start your BIM journey now!

If you would like to explore how Cadspec can help your business grow and become more profitable, please give us a call on 01905 458000, drop us an email at sales@cadspec.co.uk or visit our website www.cadspec.co.uk

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Manufacturing for **BIM**

Addressing the challenges faced by manufacturers in the BIM process requires that digital product information can be exchanged with supply chain partners. Steve Thompson, Chair of BIM4M2 discusses the support and advice available…

Even before the UK Government announced its intention to require collaborative 3D BIM on its projects by 2016, the construction industry had been busy readying itself for the change to a digital world. Whilst it is clear that the creation, exchange and use of product data is crucial to the BIM process, a common understanding of the type of information that product manufacturers should provide to support BIM has been missing. In March of this year BIM4M2 was formed, with the purpose to support product manufacturers through the transition to a BIM-ready industry, and to provide a forum to share their knowledge.

For me, one of the most exciting aspects of BIM is the willingness of organisations and individuals across the industry to collaborate and work together to address the challenge. Manufacturers have been using digital information and processes for over half a century, but exchanging digital information with supply chain partners is a very different proposition, and one that the sector is eager to tackle. From the preliminary results of the survey of manufacturers that our Promotions Working Group are undertaking, 93% of those responding said they plan to invest in the process (41% already have, and 52% will have by 2016). So, for many the question is less about whether to develop their BIM capabilities, but more about how, in what format and on which platforms? This is where the real challenges lie for the manufacturer, and the answers can be different for every organisation depending on their product types, supply chain routes, markets, regions and scale. However, the basic principles remain the same, to provide structured digital product information that can be exchanged with supply chain partners.

Mix of manufacturer organisation size responding to the BIM4M2 survey, and where they export to
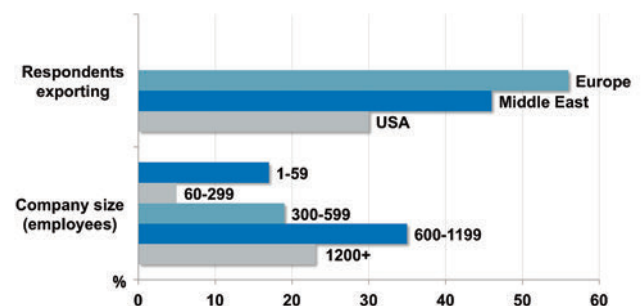
Adding to the complexity is the different information requirements of members of the client and supply chain team on any given project. To find a way through the complexity, we need to work together as an industry and develop an agreed way of describing products and their attributes, both for the UK and internationally. Certainly BS1192:4 (COBie) forms part of the solution as the mandated exchange format for Level 2 in the UK, and the broader Industry Foundation Classes (IFC) are also crucial; but these need to be supported by further definition of what information supply chain partners need and how this can be presented consistently by product suppliers. I'll illustrate this using a customer satisfaction approach.

As we know, on any construction project the client has a set of requirements that need to be met through the delivery of the project, and to support their delivery is a set of information requirements. In the BIM process these are the Employer's Information Requirements (EIR). Added to this, members of the supply chain also need information to deliver the project effectively, and

The expectation-delivery gap
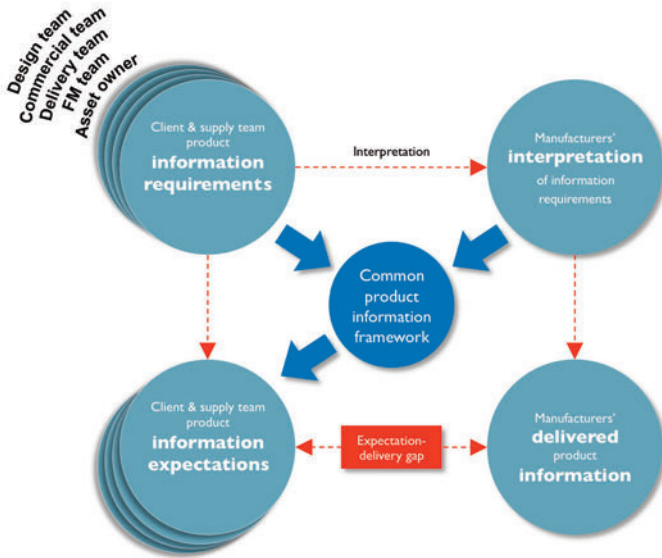
to share with others. In the BIM process these are described in the BIM Execution Plan (BEP).

Without close engagement and accurate definition of what information is required and the level of granularity (element, system, product), there is real potential for a gap between the supply team's expectations on what information a manufacturer provides and what will be delivered: the expectation-delivery gap. With a common framework for product information, supply teams will know what to expect, manufacturers will know what to provide as a minimum, and the gap between expectation and delivery is reduced.

With the development of COBie, the Digital Plan of Work and BS 8541 parts 1-6 in the UK, the gap will certainly begin to close where they are applied. To reduce the gap further the BIM4M2 Data Templates Working Group are working closely with other BIM4 Community groups, clients, professional institutes, trade associations and content providers to develop and refine product data templates to enable suppliers to provide information in a consistent format. There should, and will always be the potential to go further, but the templates will look to set the baseline to support the requirements of a Level 2 BIM maturity.

For those supplying products internationally, a common concern is that in developing structured information or objects for the UK, they will need to create different information for use in every region they operate in. The good news is that with the development of an ISO standard for the BIM process, there is the potential to reduce the differences that exist, and by structuring our information in a common digital format, it makes exchange of information across regions much more straightforward.

Furthermore, the BIM4M2 Education Working Group is developing guidance for product manufacturers on the implications of BIM, and how to develop and deliver a BIM strategy that is fit for their business.

If you would like further information on the group, or to get involved please contact us through our website or on the details provided.

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