

## What is BIM?

The acronym stands for “Building Information Modelling”, and much has been written on this subject. Further reading on this subject is recommended including the advice provided on the Institution of Structural Engineers website. Our profession is creating more co-ordinated structures by encouraging a collaborative effort across the design team underpinned by digital technologies. Buying a software license does not constitute BIM, but it may be a first step towards it.

## How will I benefit?

Structural engineers often sketch and draw in both two and three dimensions, the use of BIM software therefore allows engineers to prepare an accurate design model from which detailed two dimension drawings can be produced.

Some of the advantages to BIM adoption include:

- Ability to bid on government contracts and large frameworks
- Better in-house productivity
- More project certainty and transparency
- Better relationships with design team and stakeholders
- Improved communication between client(s) and the design team
- Detailed drawings from the design model.

## What are the downsides?

Implementing BIM will somewhat disrupt existing business practices and inevitably there will be some disadvantages. Apart from the cost perspective you may encounter:

- Reduced performance / productivity in the initial weeks (this will be reversed soon after)
- Time lost to training & pathfinding (this will reduce in time)
- Change resistance especially from less technology friendly staff
- Scepticism from conservative circles (to counter these you can use training, in-house case studies and strategic seating to bring BIM users and sceptics together)
- Increased complexity (keep to small, well defined goals and map existing processes to new ones)

It is important to realise these downsides will pale into insignificance when compared to the long-term benefits BIM facilitates.

## What is BIM Level 2?

BIM level 2 is described as one of the “BIM Levels of Maturity” and is a series of domain and collaborative models. The models consist of both non-graphical and three-dimensional data prepared by various parties during the lifecycle of a construction project. The implementation of BIM Level 2 is part of the agenda of the UK BIM alliance, formerly named the BIM Task Group.

The file based collaboration requires data rich, individually developed discipline models shared in a controlled manner to aid:

- Clash free construction
- Efficient information exchange
- Various levels of interoperability
- Client decision-making
- Design team collaboration
- Audit trail

- Archival
- The creation of an Asset Information Model for the facility lifecycle

## **What is 4D, 5D and 6D BIM?**

4D BIM is time-related information associated with specific elements of a design model. Typically, a component of a model may produce data on its lead-time, construction or installation period. 5D BIM is cost data produced including running costs and estimated costs of capital. 6D BIM is lifecycle data which includes details of a component's manufacturer. With the same token, you may see that adding structural load cases, design options and so forth will enable you to add further dimensions before you feel silly quoting a 9-dimensional model.

## **We have a 3D software license therefore we are BIM ready, right?**

BIM is much more than a software in a box. The software is a basic enabler, but the real focus is on people. How the engineers and technicians communicate, work and how they manage the increasingly far reaching data. The improved methods in design, coordination, collaboration and general relationships trump superficial improvements in "modelling a frame" with XYZ software. A client will expect information rich deliverables that are clash and error free, efficient, cheap and on time right through project delivery stages (in information exchanges).

## **What happens if I don't do BIM?**

Initially business will appear as usual, but soon you'll realise that more and more clients are asking for BIM. On most tender and pre-qualification questionnaire's BIM is featured as a pass/fail question. Hiring employees may also be a problem as most talented candidates expect to be working in BIM. Government projects and meaningful business development are also out of question. The digital innovation that BIM has brought to our sector cannot be reversed. Without engaging with it, you face a slow decline into obsolescence.

## **How much does BIM adoption cost?**

Software and hardware costs will average between £1000 and £4000 per annum per seat, but further incidental (and necessary) costs are harder to quantify. These will present themselves as:

- Initial drop in productivity (average 40% by week 6, levelling out by week 26)
- Staff training (£1000 initial training cost, £1000 lost time, £1000 p.a. per seat on continuous training)
- Support (average £1000 per seat per annum in the initial years)
- In house process development (one full time BIM champion per 20 seats with minimal project responsibilities)
- Initial mistakes and their corrections
- Project BIM responsibilities (these vary, but remember doing BIM was an enabler to win the project in the first place)

In summary, the current estimate is around £10k per set for the initial year, tapering to £4k per annum per seat. This varies broadly between firms, but generally higher investment will result in higher returns. Correct implementation will result an average 20% uplift in design productivity to mention but one benefit. 2017 prices.

## **Will staff cost increase / can I ask for a raise with BIM?**

As of 2017 this is still the case. Digitally competent and experienced staff can command higher returns, but this is expected to taper off as BIM becomes the norm. This is justified by increased productivity and a wide range of abilities that BIM delivery involves.

## **I want to adopt BIM, how do I get started?**

Once a high-level decision has been made to allow investment, your first focus should be to establish a solid technology core. This is the enabler for all future BIM efforts. Review your computer network, hardware and software inventory and upscale as necessary. Create a skills matrix / training planner for all staff. Identify and execute a pilot project, not too big, but not too small. Identify key users and train them as necessary. Record any problems and mistakes you encounter during the pilot and plan for wider rollout. Some firms find using a BIM consultant for assistance in training and implementation useful. Set SMART objectives and create a sense of urgency around BIM, let's have those benefits as soon as possible. Keep up the adoption effort; after the initial buzz some interest may wane. To maintain momentum, ensure training and communications about your achievements are kept up.

## **How do I start my first BIM project?**

First identify who the project Information Manager is. They are appointed by the client and will be able to answer all further questions. Ask to see the key BIM documents of the project:

- Design responsibility matrix
- Employers Information Requirements (EIR)
- BIM Execution Plan (BEP)
- BIM protocol (hopefully you will have seen this attached to your contract)
- Master Information Delivery Plan (aka modelling matrix, the more granular the better)
- Required levels of definition (level of detail & level of information) for each stage
- Common Data Environment manual and description

Review and comment on these documents if you feel you landed with more responsibility than expected. Gather all legacy data, models, current supply chain models and proceed with creating the first conceptual structural model. Don't forget to share it as often and as liberally as possible. Discuss proceedings with the design team. This is the most important part. Establishing a dialogue is the most overlooked and underrated aspects of BIM. Support your users through training and allow them due time to explore and find their feet.