BIM
IN A NUTSHELL

A top-level introduction to Building Information Modelling

[CONTENTS]

chapter one

What is BIM?

[WHAT IS BIM?]

Building Information Modelling, or BIM, is a collaborative way of working that is fast becoming a standard in the construction industry.

The British Standards Institution (BSI) defines BIM as 'a collaborative way of working underpinned by digital technologies, which allow for more efficient methods of designing, delivering and maintaining physical built assets throughout their entire lifecycle.'

BIM usually refers to a computer generated model, which includes not only the virtual model of the building itself, but also additional data such as how the building can handle variables such as temperature, load extremes, moisture, and other important metrics. It shows how a building will look in its environment, and manages the information associated with a building project throughout its entire life cycle, from initial design through to planning, construction, completion and beyond.

The collaborative nature of BIM is vital, allowing important information to be shared between all parties, from architects and owners, to contractors, all within a virtual construction environment, creating greater efficiencies, increasing communication and streamlining processes.

In this short e-book, we will cover a brief history of BIM, the benefits of its implementation, levels of maturity and also the challenges to BIM adoption that businesses – and the entire construction industry – may encounter. This e-book should serve as a top-level introduction to the subject, and may prove most useful for those with limited – or no - prior knowledge of BIM.

chapter two

A brief history of BIM

[A BRIEF HISTORY OF BIM]

The limits of technology have often prevented forward-thinking ideas from becoming a reality, and the same can be said of BIM. During the 1960s, individuals began discussing how to use computers to capture the visual world; creating the design of a building and storing all relevant construction information within the same model.

As early as 1975, systems were being developed that are quite similar to BIM as we know it today, however the terms 'Building Information Model' and 'Building Information Modelling' (including the acronym 'BIM') did not become popular until some 10 years later. Architectural expert Charles Eastman described a system of joining shapes, viewing from different angles and storing information in a database in his paper 'The Use of Computers Instead of Drawings In Building Design'. Computer-aided design (CAD) greatly improved on two-dimensional hand-drawn plans, however BIM extended this even further, adding to the three primary spatial dimensions (width, height, depth) with time as a fourth, and cost as a fifth.

Today, BIM is fast becoming a standard for the construction industry. BIM was brought to wider attention in the 2011 UK Government construction strategy. Following this, the policy paper 'Government Construction Strategy: 2016 – 2020' made BIM Level 2 mandatory on all public sector projects from April 4th 2016 onwards. Regulatory developments look to continue into the future, with the 2016 paper stating, "The government will develop the next digital standard for the construction sector – Building Information Modelling 3 – to save owners of built assets billions of pounds a year in unnecessary costs, and maintain the UK's global leadership in digital construction".

chapter three

Levels of BIM maturity

[LEVELS OF BIM MATURITY]

The BSI defines four levels of BIM maturity, ranging from non-shared 2D models, to a truly collaborative virtual cloud-based environment

BIM Level 0

- No collaboration
- 2D CAD drafting utilised

BIM Level 1

A mixture of 3D concepting, and 2D drafting of statutory approval documentation

- Electronic sharing of data using a common data environment (CDE)
- No collaboration between parties, but data is shared

BIM Level 2

All parties use their own 3D CAD models, but not necessarily working on a single, shared model

- Collaboration is used. Data is exchanged between parties and design information is shared in a single format
- Federated BIM model is created. Each party can combine data with their own in order to make checks

BIM Level 3

Full collaboration between all disciplines by means of a single, shared project model which is held in a central repository

Source: http://pages.bsigroup.com/l/43652/2017-08-22/jwsk2l?utm_source=Construction-Manager&utm_medium=online&utm_content=LBB&utm_campaign=BP3

chapter four

Benefits of BIM

[BENEFITS OF BIM]

BIM is already creating tangible bottom-line returns by streamlining workflows.

As we have seen, BIM is becoming an increasingly prominent feature on the construction landscape. The government changes in regulation, making BIM level 2 now mandatory on public sector projects, shows a keen interest in implementing BIM as an industry standard overall. However, aside from ensuring regulatory compliance, BIM is also already benefitting construction in a multitude of ways. Here, we take a look at the most prominent benefits in greater depth, to explore why BIM is truly changing the way we shape our built environment.

Time efficiency

In a 2017 survey, 85.2% of companies said they experienced delays on recent construction projects

www.cornerstoneprojects.co.uk/index.php/delays-in-construction-projects/

With statistics like the above, it's clear to see why improving efficiency is a primary ongoing goal for construction businesses. With BIM, the entire build is planned in advance, and information for each step is held within the shared model. This can help identify and fix problems in a virtual environment during the planning stage, ultimately leading to significantly fewer issues in the field and reduced delays. Projected clashes can also be detected early, to ensure prompt resolution.

60% of respondents to the recent 2017 NBS survey thought that BIM will help bring time efficiencies, reducing time from inception to completion

www.thenbs.com/knowledge/nbs-national-bim-report-2017

Cost efficiency

Hand-in-hand with time efficiency, is the corresponding cost saving bought about by implementing BIM. Reduced delays, reduced rework, reduced errors and omissions, and a reduction in on-site waste are all key benefits, saving BIM-led projects significant money.

70% of respondents to a recent NBS survey believe cost reduction in the design/build/maintain lifecycle will be realised

www.thenbs.com/knowledge/nbs-national-bim-report-2017

Remote access and improved collaboration

As Autodesk points out, 'sharing and collaborating with virtual models is far easier than drawing sets, opening up a wealth of functions only possible in a digital environment'. The single model can be shared amongst all stakeholders and suppliers to aid collaborative working during the entire duration of the project, and provide comprehensive information to all parties at each and every stage. Changes made to the digital model are immediately communicated to all parties, ensuring everyone has access to the most recent model without the need for lengthy manual admin. As the model can be held in a cloud-based environment, this can be accessed from anywhere across the globe, connecting all parties, from stakeholders to contractors.

Solving quality issues

According to the Chartered Institute of Building (CIOB), more than three-quarters of construction professionals believe the industry's current management of quality is inadequate. However, as David Philp, Global BIM/MIC Consultancy Director at Aecom, states in a recent blog post for BIM+; "BIM, associated technologies, collaborative working processes and more important, accurate structured data, can undoubtedly significantly help the quality agenda. BIM lets us prototype a built asset in a virtual environment before it hits the site, ensuring that the design is coordinated, interfaces are managed, buildability is tested and, through a soft landings process, maintainability is simulated."

chapter five

Challenges to adoption

[CHALLENGES TO ADOPTION]

Whilst there are many proven benefits to BIM implementation, there are remaining barriers of entry to full adoption.

In its 2017 National BIM Report, the NBS found that barriers to BIM adoption tended to fall into two categories: internal, 'such as lack of training, expertise, time or funds to meet the cost of investment', or external, such as 'lack of client demand and projects being too small to require BIM'.

The report cited the following as the main barriers to implementing BIM:

73% Lack of in-house expertise

65% No client demand

59% Lack of training

55% Cost

49% No time to get up to speed

46% Working on projects considered too small

Source: www.thenbs.com/knowledge/nbs-national-bim-report-2017

[CHALLENGES TO ADOPTION]

As BIM constitutes a change to previous, established and understood ways of working – sometimes a drastic change at that, depending on the specific company – it is clear to see why lack of in-house training is the number one cited challenge businesses face in implementing BIM across their workforce.

93% of users interviewed said that adopting BIM required changes in their workflow, practices and procedures, yet only 4% of BIM users said they 'wish they hadn't adopted BIM'. As the report concludes, 'we can understand why so few regret adopting BIM when a majority see that BIM brings cost efficiencies, and that clients and contractors will increasingly insist on it'.

With investment of not just capital, but crucially - time - we are likely to see BIM uptake continuing to increase dramatically over the next few years, with the benefits being experienced by an increasing number of businesses across the globe.

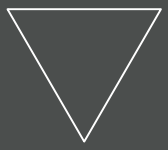
References:

www.thenbs.com/knowledge/nbs-national-bim-report-2017
www.thenbs.com/knowledge/what-is-building-information-modelling-bim
www.bimplus.co.uk/management/explaining-levels-bim/
www.cornerstoneprojects.co.uk/index.php/delays-in-construction-projects/
www.constructionmanagermagazine.com/news/three-quarters-construction-professionals-say-qual
www.rics.org/uk/knowledge/glossary/bim-intro/
www.bimplus.co.uk/people/bim-solution-constructions-quality-issues/
www.digitalschool.ca/history-bim/
www.autodesk.com/redshift/building-information-modeling-top-10-benefits-of-bim/
http://pages.bsigroup.com/l/43652/2017-08-22/jwsk2l?utm_source=Construction-Manager&utm_medium=online&utm_content=LBB&utm_campaign=BP3

Would you like to find out the benefits of integrating BIM with time lapse monitoring?

Download our **free infographic** through the link below, to demonstrate how integrating BIM with time lapse site monitoring could truly benefit your construction project.
Your project, truly visualised.

http://info.lobsterpictures.tv/the-benefits-of-bim-and-time-lapse-integration-free-infographic



lobster pictures

Call: +44 (0)117 370 4217
Email: info@lobsterpictures.tv