



# Unlocking the value of BIM

A whitepaper from Leica Geosystems



- when it has to be **right**



# Introduction

Building Information Modelling (BIM) has the potential to become the biggest step change in the way that the construction industry operates within the built environment since the industrial revolution – promising major benefits in terms of cost, accuracy and time to build.

Since the concept of BIM emerged the debate has continued around the value and application but as more countries make BIM a legislated requirement, the debate is no longer whether BIM should be adopted, but rather how it can be successfully implemented, and how its full value can be unlocked.

This whitepaper from Leica Geosystems explains the benefits of BIM, dispels common misconceptions and reveals its untapped potential.



# The evolution of BIM

**The complex nature of designing and constructing the built environment means that errors, changes and delays have become an inevitable part of almost every project – accepted consequences of attempting to alter the earth’s landscape.**

The most common cause of the challenges that delay and derail projects is information flow: inconsistencies in what the contributing parties are working towards and trying to deliver. This could be design flaws that are discovered late, budgeting not corresponding to plans or problems with operations and maintenance integration. Too often projects result in multiple trips back to the drawing board with significant financial implications for the client.

Building Information Modelling was conceived to address and eliminate many of these challenges. The principle is creating a precise reference point for all details of a building at all stages, this often starts in the form of a 3D prototype, overlaid with scheduling (4D) and estimating (5D) data. Having this data at the start of a project, enables accurate planning and forecasting, eliminating errors and risks. Then, when used throughout the lifecycle of construction and continually updated to reflect the actual progress, BIM gives all parties access to accurate information on the fly which enables better and faster decision making.

Created and used in this way, BIM becomes the glue that holds design and construction together.

Simon Tritschler, BIM Deployment Specialist at BAM Ireland says: “BIM is attempting to take learnings and best practices from process driven industries such as petrochemical and manufacturing. Historically construction hasn't been so process driven. It's been a 'get it done' industry, this mind-set has created challenges that can and should be corrected.”

BIM processes have the potential to make the commissioning and design stages more thorough and make timescales and budget forecasts accurate, creating a realistic and comprehensive basis for construction to build from. Then latterly it can exist as a central repository for rich information about the asset, that serves to provide all future suppliers and maintenance teams the ability to manage the facilities most effectively.

Mark King, EMEA BIM Solutions Manager at Leica Geosystems says: *“It's vital that the construction industry moves forward in a progressive way and leaves behind legacy inefficiencies. Effective implementation of BIM processes is the best way of achieving this.”*

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**Simon Tritschler, BIM specialist at BAM Ireland**





## The challenge and misconception of BIM

Recent surveys among professionals working in the built environment industry suggest that awareness of BIM is now widespread.

Many people are even reporting that they have, to some degree, implemented BIM processes themselves. However the value of BIM is still not being fully realised across the industry. While awareness of BIM as an emerging development – and in some countries a mandated requirement – might be high, understanding of what BIM really is remains inconsistent.

Its roots in software have led to perceptions that BIM simply refers to 3D modelling, where the model is initially created for the purpose of visualisation and drawing production. When this approach is taken the model is often of limited value to other parties as the information it holds isn't sufficient to guide and support the construction process.

Mark King says: *"The problem with adopting BIM in this way is that it doesn't solve the problems it was intended to. Projects like these might claim to have adopted some BIM processes, but when the models are used in isolation with a lack of collaboration from the start they fail to eliminate any of the inefficiencies associated with traditional construction projects."*

**I like to think of BIM as 'better information management' – managing information purposefully and thinking about the project in context for its whole life."**

Anne Kemp  
Chair, UK BIM Alliance (Director, Atkins)

Anne Kemp, Chair, UK BIM Alliance (Director, Atkins) says: *"People still think of BIM as 3D models. This literal interpretation doesn't maximise its value."*

The consequence of these misconceptions is that many people throughout the lifecycle of asset delivery and management are unable to engage with BIM fully. The original model isn't shared or used beyond the design stage, and instead the contractor duplicates effort making their own models and collating their own data. We're in the familiar territory of designers and contractors working independently and often pulling in different directions.

Mark King continues: *"Projects like these might claim to have adopted some BIM processes, but when the models are used in isolation with a lack of collaboration from the start, they fail to eliminate any of the inefficiencies associated with traditional construction projects."*





## The real value of BIM

To realise the potential of BIM Anne Kemp says the key is trust: **“Historically there has been a fear that’s stopped collaboration between all parties involved in the building lifecycle. The designers feared letting go of their intellectual property and having it distorted, while the contractors didn’t have faith that the designer’s models would meet their requirements.”**

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**Mark King**  
EMEA BIM Solutions Manager at Leica Geosystems

Inevitably an asset will evolve from its original plans at various stages in delivery or use, either to correct challenges or to respond to changing needs. To facilitate this, changes should be properly reflected in the individual coordinated models. BIM should be a continuous change process – a true reflection of the real physical facility.

Simon Tritschler says: *“There needs to be a level of openness that people aren’t used to.”*

The benefit of achieving this level of openness, is more efficient management of the construction process and subsequently, the facility’s use: from early detection of problems; visibility of what impact any changes will have on other aspects of the facility on suppliers and timings; and analysis of how the asset is performing.

Mark King says, *“BIM opens up the possibility of designing smarter environments. We have the potential to plan for and integrate intelligent technology such as sensors, tags, actuators and meters in the most beneficial way. Once we have this technology and other smart objects embedded we’ll be able to record the data and see patterns of how the environment is performing and how it is being*





## Taking BIM out of the office

**A significant way of achieving the holistic benefits of BIM is by taking the principles and practice out of the office and into the field.**

Even when all parties contributing to a build are working from the coordinated model, if that model only reflects the design elements of the asset then its value is still limited. Any changes proposed to the facility can't be delivered efficiently and accurately, because they haven't factored in variances on site within the construction processes.

By collecting and incorporating real field data, the design, construction and management of an asset can be based on reality. This ensures the integrity of the construct-able models, which allows for more precise decision-making and therefore fewer costly and time-consuming errors.

By extending the use of BIM into the field is to adopt Kemp's concept of "Better Information Management". Two-way sharing of data means that an asset can

**Connecting BIM processes from the office to the field and back again has the potential to drive major innovation in construction**

start from a comprehensive and well planned model – leading to fewer human errors in the early stages, virtually preventing and resolving realities emerging onsite.

This enables all parties to know that facilities are being constructed as designed, and it flags issues to avoid rework and eliminate flaws in the integrity of the asset.

Mark King believes that connecting BIM processes from the office to the field and back again has the potential to drive major innovation in construction; from real-time decision making, smarter ways to view complex data on site based on various situations, through to automation.



# Unlocking the value of BIM through greater understanding

**To achieve the benefits that BIM has to offer, there has to be an industry-wide understanding and belief in its complete value.**

Simon Tritschler continues: *"The problem is that BIM is a big umbrella term. It's the meta data around the concept of the building – everything from the budget, the schedule, down to the fixtures and fittings. That's a lot to understand, particularly when most people are often viewing BIM from the perspective of their confined role on a project."*

**...the value of BIM isn't as compelling as it could be. It's only when it is applied in it's entirety that its true value can be seen and understood.**

Because BIM has evolved over many years with definitions and standards only recently becoming common, it still stands for different things to different parties. When assessed only as component processes, the value of BIM isn't as compelling as it could be. It's only when it is applied in it's entirety that its true value can be seen and understood.

Technology is an enabler that allows BIM to be implemented throughout the process, from design office software, through to connected instruments on the construction site.

The dynamic flow of data between office and site bridges the gap, allowing the digital world to better represent and interact with reality.

When all parties see the benefits of adopting BIM holistically rather than viewing it as an individual action or process at their stage of the asset lifecycle then we can expect to see more projects delivered collaboratively and successfully.



**To find out more about how Leica Geosystems is helping businesses to unlock the value of BIM, please email our BIM Solutions Manager:  
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