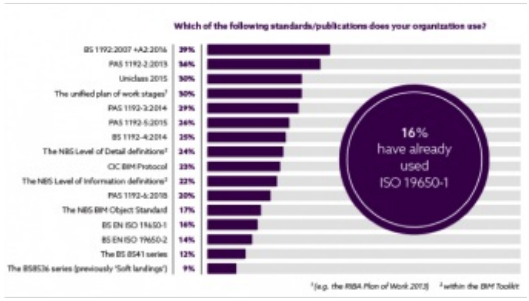
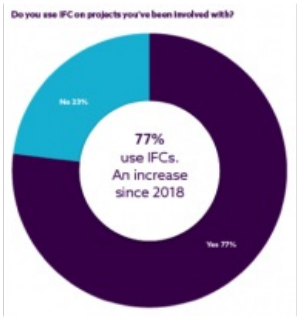
# *THE PAST, THE PRESENT AND THE FUTURE OF THE NEW INTERNATIONAL BIM STANDARD*

# The Art of BIM Implementation




Aside from the normal barriers to implementing change within a business, additional barriers exist in the case of building information modelling (BIM). Implementing BIM requires leadership, a team with common and clear goals, and a mechanism to celebrate progression.

Building information modelling (BIM) is a means of creating a data-rich digital representation of an asset, be that buildings or infrastructure. The processes behind BIM form the foundations for smart information production (digitisation) and management through the lifecycle of the project. BIM encourages all project parties to work collaboratively, aiding project efficiency, de-risking project cost models and programmes, and enabling use of the model to inform operations and maintenance decision-making in the future.

Standards exist to inform end clients and project teams about how to implement BIM in the delivery and management of projects and assets. In the UK, the adopted standard for BIM was the PAS 1192 suite which was published by BSI (British Standards Institution) and was released back in February 2013. These standards have since been widely adopted as a BIM project 'framework', encouraged by the Government BIM mandate in 2016. This standard, however, was founded on a predominantly 'UK-centric' view and did not necessarily align with the design and construction processes undertaken outside of the UK. The natural progression of this BIM Standard was therefore to not only make it an official British Standard but also make it more internationally applicable. Out of this, as of January 2019, the BS EN ISO 19650 standards (Parts 1 & 2) were born.

The BS EN ISO 19650 still holds many of the key principles scribed within the PAS 1192 suite; however, a number of key areas have been enhanced, including the formal introduction of the 'lessons learnt' initiative, as well as a focus on removing specific UK terminology.

## Good degree of flexibility

To ensure an international balance, the standard was appraised by representatives from a collection of national standards bodies as set out in Adjacent Digital Politics (2019). "The ISO 19650 series has been developed by an international working group with the aim of enabling teams to minimise wasteful activities and increase predictability around cost and time. Designed to be achieved through a common and collaborative approach to the management of information."

The latest National BIM report (2019) has indicated 14 - 16% of organisations have already adopted the new BS EN ISO 19650 standards. (NBS, 2019)

Whilst the standards for BIM now provide a unified approach to working, they are built in a way that allows countries to have a good degree of flexibility to meet their own national information requirements. This is exercised through a National Annex (attached to the BS EN ISO 19650 standards). The UK was the first country to develop its own National Annex and other countries are now following suit.

The National BIM report, (NBS, 2019), states "To give you an example: there's a requirement within ISO 19650-2 for information to be classified. In the UK National Annex, it states that the classification system is to be Uniclass 2015, and we would expect the US National Annex to state that the classification system to be used is Omniclass. This enables the ISO 19650-2 requirement for classified information

to be met, but in a way that allows flexibility for each region to use standards that are already in place."


A BIM model of Olympia Exhibition Centre, London.

## Implementation of BIM requires leadership

A decade ago, it was normal to challenge the concepts and values of BIM. We are now, however, in a very different phase. BIM is widespread across the industry, with its benefits being recognized by many and in a vast number of ways. The BIM era has been driven not only by the 2016 government mandate but also a general momentum from organizations throughout the industry, for example design teams and contractors using their own initiative to recognize efficiencies through the adoption of BIM.

It's time for everyone to start (or continue) their BIM journey and craft the direction and pace of these to benefit the company and clients. This, however, is easier said than done!

Though these standards have been produced to drive us forward into a new era of information production, exchange, management and delivery; all should be aware that meeting the requirements will not be simple. The BIM process stimulates change, an uptick in process management, an increased need for competent and trained personnel, and a wider awareness and consideration of one's position within the wider project lifecycle. As such, implementation of BIM requires leadership, a team with common and clear goals, and a mechanism to celebrate progression.


Use of BIM standards.

## Progression along the BIM journey

Aside from the normal barriers for implementing change within a business, additional barriers exist when implementing BIM. One of the key barriers relates to the creation of a new 'alien' information workflow and its associated protocols and documents, as well as hundreds of 'TLAs' (Three Letter Abbreviations!) It's completely normal for the glossary of a typical BIM document, such as a BIM Execution Plan, to be two or three pages long; therefore, aside from encouraging all to progressively become familiar with the terminology, it is prudent to have BIM champions within a company to provide support for wider business.

Paul Shillcock, co-author of the PAS 1192-2 standard (and accompanying UK National Annex) has stated that "there will be a need for both the providers and receivers of information to transform the way in which they produce, exchange and use digital information, whilst aligning their business process to the latest industry standards and best practice." (BIMPlus, 2019)

In our experience at Plowman Craven, one of the most effective ways of progressing along the BIM journey is to practise it. As each project progresses, lessons are learnt (in line with BS EN ISO 19650 vision), and best practice is progressively developed. Progression on the BIM journey can be seen in many ways, whether that's the evolution of a common data environment, the optimization of an internal workflow, the appropriate allocation of roles and responsibilities, or even the 'back-to-basics' technique of communication!

## Project lifecycle

Compared to traditional projects, BIM advocates an increased frequency of information exchange throughout the project lifecycle. The challenge is that many disciplines work in many applications and therefore information interoperability is not always easy. This is, however, possible with open format file types like IFC. These can be exported and imported into most authoring and reviewing platforms and therefore provide a key information link between specific task teams.

For example, when a design has been detailed and the subcontractor then takes ownership of it, the designer can collaborate cross-platform, therefore enabling the subcontractor to pick up from where they left off. This alone provides a significant programme saving as the subcontractor no longer needs to recreate the design intent information.

The BS EN ISO 19650 strongly advocates the importance of interoperable data formats, like the IFC.

As per clause 5.1.6 of BS EN ISO 19650-2:2018, "using open data standards whenever possible to avoid duplication of effort and interoperability issues." (BSI Standards Limited, 2018)

The NBS National BIM report 2019 indicates that 77% of individuals use the IFC format within their project. (NBS, 2019). This illustrates a key step not only in industry mindset progression but also the start of a new, next level, collaboration era.


Use of the IFC fromat.

## Digital twin

Continuing on from the mindset of increasing collaboration between parties within the project lifecycle - and exploiting the latest technological advances - it would be rude not to mention the latest BIM buzzword, the 'Digital Twin'.

Through the correct adoption of BIM Standards and Processes, in alignment with BS EN ISO 19650, a BIM project can be appropriately developed to enable an accurate virtual representation of the as-built asset.

The information model (accurate virtual representation) can then be stripped down and passed through to a facilities management platform, where the asset information model (AIM) is built up, developed and further enhanced by adding additional asset data. Utilizing appropriate maintenance forecasting procedures within the facilities management system, one can use the AIM to inform decision-making

during the operational phase. At this point, it becomes a digital twin. Harris (2019) describes the digital twin: “The digital twin concept is more than just an evolution of a BIM or 3D model. More advanced digital twins use two-way interactions with their physical counterparts; this theoretically allows for the physical asset to be controlled remotely – or even autonomously maintained – by its digital twin. For example, through the use of devices and sensors and machine learning linked to the internet of things, a building’s digital twin could use its collected data to react to anomalies without the requirement for humans to interact.”

## Conclusion

Of course, all of the above is only possible with a solid information management structure, an eagerness to innovate and a drive for industry best practice. The BS EN ISO 19650 series provides us with a framework to do this, and it is accessible to all. Valuable guidance documentation is available through the UK BIM Alliance website and it is there to help you. So, no matter where you currently stand on your road to BIM - whether yet to embark or with plenty of miles under the belt - there is plenty of learning for all and an exciting journey ahead.

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https://www.gim-international.com/content/article/the-art-of-bim-implementation