Session 1.3

Speaking a Common Language
Lesson Learned from BIM Level 2 and 8 Years in the UK
Krigh Bachmann, DIALOG

Class Description

How do you coordinate something like BIM when everyone is talking about something different? We will look at the UK’s BIM Level 2, the language and standards that it got right, and why it has gained so much international attention by clients, building owners, and the rest of the AEC industry.

About the Speaker:

Krigh Bachmann is the Manager of Design Technology for the international design and engineering practice DIALOG. He joined them in 2016 after returning from 8 years in the UK, where he was the BIM Manager for Gensler and Pollard Thomas Edwards. While in the UK, he worked on projects ranging from datacentres in Europe and malls in Kuwait, to 1.2 million sqft office fitouts in the heart of London. He has done talks for the tech community in London, the London Revit user Group and was an active member of the national BIM for Local Government task group in the UK. Within Canada, Krigh is now engaging with BuildingSmart Canada and CanBIM to assist in promotion and development of BIM in Canada.
BIM: Driven from the Top

The Government Construction Strategy was published by the Cabinet office on 31 May 2011. The report announced the Government’s intention to require: collaborative 3D BIM (with all project and asset information, documentation and data being electronic) on it’s projects by 2016.

Essentially the UK Government has embarked with industry on a four year program for sector modernization with the key objective of: reducing capital cost and the carbon burden from the construction and operation of the built environment by 20%. Central to these ambitions is the adoption of information rich Building Information Modeling (BIM) technologies, processes and collaborative behaviours that will unlock new, more efficient ways of working at all stages of the project life-cycle.

The BIM Task Group

The Building Information Modeling (BIM) Task Group is a UK Government-funded group, managed through the Cabinet Office, created in 2011 and chaired by Mark Bew. It was founded to “drive adoption of BIM across government” in support of the Government Construction Strategy. It aimed to strengthen the public sector’s capabilities in BIM implementation so that all central government departments can adopt, as a minimum, collaborative ‘Level 2’ BIM by 2016.

The Task Group is seen as the gate keepers to BIM Level 2 and most of the resources can be found through their website. In October 2016, an updated BIM Task Group was announced as they delivered the February 2015 Digital Built Britain strategy which will be the starting point for BIM Level 3.
Why Level 2?

BIM Level 2 was driven by the BIM Task Group, a government funded task force that then worked with national standards organizations in the UK to develop individual specification and resources needed. The concept of “Level 2” was best explained through the “Bew-Richard Wedge” which was developed by Mark Bew and Mervyn Richards in 2008. The wedge, which has become one of the most referenced BIM diagrams in the UK, shows how the industry is growing from traditional Level 0, CAD based, to a more intelligent and integrated approach. Below the wedge are the standards they identified as missing from industry.
Level 2: A Line in the Sand

BIM Level 2 was about setting a goal for the UK Government. It was a mandate of Her Majesty’s Government (HMG) that all centrally procured Government projects utilize BIM Level 2 as of April 2016. The goal was to reduce overspending and carbon emissions on projects through increasing the efficiency on projects. As shown in the wedge above there are many levels of maturity within the industry. BIM Level 2 was about setting a defined level we could benchmark projects against. The government was attempting to get all of their projects to a certain level so that they could then set out the next level and keep pushing ahead.

The reality of the situation in the UK is that as April 2016 arrived, some departments in the government were ahead of others and there was still confusion of how compliance with the standards would be measured and monitored. It is more the private sector that has embraced BIM Level 2 as consultants, contractors and clients began to understand BIM and had a common language to be able to communicate and organize their projects with. This is also the reason why it has gotten so much attention internationally. The system is very holistically thought through and although the UK are in someways behind in the adoption of BIM and the software that drives it, the standards that they developed have made it easier to convert.
The Pillars of BIM Level 2

Below are the standards that make up BIM Level 2. A lot of them are available digitally on the web. Publicly Available Specifications (PAS) are free and British Standards (BS) are typically purchased through the British Standards Institution (BSI).

### Collaboration

**BS1192 : 2007**

A standards document that looks to address architecture, engineering and construction best practices. This includes naming conventions and exchange protocols.

### Design & Construct

**PAS 1192-2 : 2013**

Referred to as “1192 Part 2,” this specification expanded BS 1192 : 2007 to include BIM. Still focused on the Design and Construction Phases, it looked to document standards, methods and procedures and a better framework for collaboration. Commonly referenced by project teams, it is a specification not the requirements of the project (i.e. the framework not the deliverables).
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**Use & Maintain**

**PAS 1192-3 : 2014**

Same as 1192 Part 2 (above) but for Operations and FM Phase of asset management. It looks to specify how the information flows and update as you maintain a building using BIM.

**COBie UK**

**BS 1192-4: 2014**

Specification for COBie as a recognized standard for information exchange. This British Standard defined UK COBie, which is not the same as the one developed in the USA. COBie is commonly referenced as one of the deliverables for BIM Level 2, although there is a question of whether or not the end users need it.

**Security**

**BS 1192-4: 2015**

This British Standard looked to address how security should be considered when working on a BIM project. One of the primary goals of BIM is to allow information to flow easier which might go against the need for secrecy on certain projects (i.e. military).
Legal & Contracts

BIM Protocol

Seen as an amendment to contracts to cover issues such as the use of models, liability and roles on the project, there was a lot of criticism of the document because it tried to cover design and construction, but in the end conflicted itself. It also required lawyer or legal expert to review, amend and could not just be inserted into a project agreement.

Digital Plan of Works

nbs Toolkit

What started as the “Digital Plan of Works” became the nbs Tool Kit. A web based tool for planning BIM project requirements, it was suppose to be an easy way for clients to pick what Level of Detail (LOD) and Level of Information (LOI) they needed, but failed to educate them upfront about the BIM process and how to engage in it. It dove in too deep too quickly. It was good as a standard reference for LODs and LOIs.

Standards for FM

BS 8536

Aimed to outline to the operator and the operations team how to engage the project from the outset.
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Classification System

Uniclass 2015

With a similar logic to Omniclass and Masterformat, this classification system was an update to Uniclass 2 and sought to have “a specification number for everything.” As BIM allows us to break down assemblies into their components, this sort of system functioned to allow keynoting of each item. The only drawback was getting the industry to switch as most are not even using Uniclass 2, but older systems like NBS Classification codes.

Templates

CPIx Assessments, BEP, EIR, etc.

There are resources available as part of BIM Level 2 that included templates for BIM Execution Plans, IT and BIM Assessments for clients to use when procuring a project, etc. However many of these were developed before BIM Level 2 and quickly became out of touch with where the industry was going.

The templates also put clients in an odd position of being able to include assessments for consultants and contractors, but without the knowledge of deciphering the responses. Clients also regularly referenced the EIR template without actually filling it out. This demonstrated a general lack of understanding and a need for expertise within the client teams regarding BIM and its implementation.
Examples from BIM Level 2

There is too much to BIM Level 2 to cover in one session, so below are a few examples from BIM Level 2 and how they helped me understand the BIM Process.

Information Delivery Cycle

This simplified diagram shows how the information flows as part of an integrated BIM project. The original diagram in PAS1192-2 focused on a single project cycle and therefore did not show the upfront documentation needed by the clients for their information requirements. As I discuss with client how they engage with BIM, I commonly refer back to this document to explain how their project requirements should be driven by their organizational goals. It is the organization that will dictate how they manage their assets which then produce the requirements for the project.

Project Roles

It is interesting that many just expect BIM to happen on projects. I have had many conversations with clients to explain that the most effective BIM projects have people assigned to specific roles. These are actually included as part of the appointments in the contract. The roles (that are defined in PAS1192-2) are not job titles and can be undertaken by more than one individual (e.x. 6 people can be one role). Individuals that take on a role: can take on more than one role, must be competent to take on a role and must have authority to take on a role.
Project Wide Roles

Employers Representative

Responsibilities:
- Identify key decision points
- Define plain language questions
- Implement information protocol
- Information management role appointment
- Acceptance of the information model (in the cde)

Design/Construction Lead

Responsibilities:
- Develop BIM Execution Plan
- Task team appointments and assessment
- Assigning the Level of Definition (LOD)
- Develop volume strategy (if used)
- Authorization of the Project Information Model

Project Information Manager

Responsibilities:
- Responsible to the Project Delivery Manager
- Project Standards, Methods, and Procedure (SMP)
- Assure Information Model compliance
- Ensure Task Teams have the capacity to deliver
- Identify & mitigate risk against delivery

Project Delivery Manager

Responsibilities:
- Master Information Delivery Plan
- Communication link between Task Teams
- Assure the delivery of the Information Model
- Ensure Task Teams have the capacity to deliver
- Identify & mitigate risk against delivery
### Task Team Roles

#### Task Team Manager

**Responsibilities:**
- Responsible to the Design/Construction Lead
- Ensures completion of the Task Information Delivery Plan
- Approval of the Task Team Information Model

#### Task Information Manager

**Responsibilities:**
- Responsible to both the Design/Construction Lead and Project Information Manager
- Point of contact for Information Management
- Ensure compliance with the Project Standards, Methods & Procedures
- Education and training

#### Interface Manager

**Responsibilities:**
- Resolving spatial coordination issues with other Task Team Interface Managers
- Escalating unresolved coordination issues to the Design/Construction Lead

#### Information Author(s)

**Responsibilities:**
- Production and/or maintenance of information
- Coordination of Information
- Escalate interface issues to Interface Manager
Common Data Environment (CDE)

The concept of a shared information exchange is nothing new, but it was included as part of PAS1192-2 because it was decided that having a location that would always provide access to the latest information fit perfectly with the concept of BIM. What they defined beyond having a shared information site, was the way information should flow through it and how it should have gate-keepers. These appointed people have the authority to review documents and models, and approve it to a shared or published status.
Conclusion

What we can learn from BIM Level 2

In my case, living in the UK and now working in North America, the important part of BIM Level 2 was to understand the framework and the purpose of the individual components. Although, as I work on projects in Canada and the USA, the specific terms and acronyms from BIM Level 2 are not common and understood, yet I can converse with others about the concepts which still hold true. I talk with clients about the need for organizational BIM strategies, with sub-consultants about model naming standards and with contractors about the legality of exchange protocols that will allow for FM integration. It is less about the specific name of a document or the standard, and more about understanding what it is used for and why it is important to the process.

BIM Level 2 has a lot to offer and as I have integrated back into the North American market, I still find myself preferring it over a lot of the established standards here. Hopefully, you have also gained a little insight into it, and I strongly recommend further reading of the documents that make up the standards (link below).

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Additional Resources

The following are some of the places you can go to learn more about BIM Level 2.

<table>
<thead>
<tr>
<th>The BIM Task Group</th>
<th>The BIM Task Group is the original government funded task force who set about to develop BIM Level 2. Most additional resources can be found through links on their website. The group is also now looking to develop BIM Level 3.</th>
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<tbody>
<tr>
<td><a href="http://www.bimtaskgroup.org">http://www.bimtaskgroup.org</a></td>
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<tr>
<td>The B1M</td>
<td>A group that produces short videos focused on BIM. Based out of the UK, they have a great collection of videos that each focus on different aspects of BIM Level 2.</td>
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<td><a href="http://www.theb1m.com/BIM-For-Beginners">http://www.theb1m.com/BIM-For-Beginners</a></td>
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