BIM

‘An advanced tool to reduce costs and support environmental design in the UK’

NOW and NEXT

THE CONSTRUCTION PUZZLE-

HOW TO

MAKE EVERYONE WORK COLLABORATIVELY?

Peter Caplehorn RIBA

Deputy CE and Policy Director CPA
N ow

Building information Modelling
Is an industry game changer
Is not about 3D graphics
It is about DATA
It is about de-risking construction
It is therefore about efficiency
Faster cheaper better in every way
Clients will want it
You need it
NOW

BIM - WHERE ARE WE

ITS ABOUT CAPTURING AND USING THE DATA FROM THE VERY START OF THE PROJECT TO ‘IN USE’ AND BEYOND THAT DATA IS RELIABLE VERIFIABLE TRUSTWORTHY
NOW

CONTEXT WHAT WE NEED TO UNDERSTAND - CURRENTLY DRAWN 2.5 TIMES CONSTRUCTED 1.5 TIMES - POOR VALUE
EXPERIENCE TO DATE  NOW

As early as the mid 70’s Car and Plane manufacturers started to design test and manufacture using computing.

Today this is all products and goods use digital manufacture production and distribution.

Why not buildings?
NOW

MANY BUILT EXAMPLES OF BIM METHODOLOGY SURROUND US. THIS IS THE CHEESEGRATER IT USED BIM TO-
• CUT THE COST
• CUT THE TIME TO BUILD
• RESEQUENCE THE BUILD
• CONTROL MATERIALS TO SITE
• BRIEF ON SITE TEAMS DAILY
• CONTROL HEALTH AND SAFETY
• AND MORE ......
NOW

THE STORY SO FAR

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PAS 1192-2:2013
Specification for information management for the capital/delivery phase of construction projects using building information modelling

NOW

Construction prequalification questionnaires

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Deputy CE and Policy Director CPA
LEVEL 2 DOCUMENTS
Published standards
Digital plan of work
Digital tool kit
‘The wrapper’
Arriving very soon.

ESSENTIAL-
BS 1192-2007
PAS 1192-2 2013
PAS 1192-3 2014
PAS 1192-4 2014
PAS 1192 -5 2015

RECOMMENDED-
BS 7000-4 2013
BS 8541-1 2012
BS 8541-2 2011
BS 8541-4 2012
BIP 2207 GUIDE

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NOW

LEVELS OF MATURITY

4th April 2016

Phase 3

Project Lifecycle Management

Phase 2

iBIM

Phase 1

Phase 0

CAD

Drawings, line arcs texts etc.

Models, objects, collaboration

Integrated, Interoperable Data

95% of users
2D drawings lack of coordination impact
25% waste through rework

2D and 3D spatial coordination based
around Avanti and the BS1192:2007 has
the potential to remove error and reduce
waste by 50%

A fully integrated and interoperable
iiBIM has the potential to mitigate risk
throughout the process and increase
profit by +2% through a collaborative
process

CPIC

AVANTI

BS1192:2007

User Guides

ISO BIM

IDM

IFC

IFD

© M. Bew and M. Richards 2008

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From PAS 1192-2

Figure 3 – The information delivery cycle
What is COBie?
Data Structure
BM = Building Model
(3D without information)

Drawing symbolic representation

BIM

Material Information
Product Information
FM Information
Cost Information
Resource Information
Procurement Information
Relationship Information

Detailed Design
Project Type
Energy Analysis
Process
National Requirements

Geometric Information
Demonstration Projects Experience

Further 25 underway

Feed back build on experience available

Refining guidance
BIM enabled technology -
Emulation
Virtual Reality
Augmented Reality
**40%** already invested in BIM

Do you see your investment in BIM as worthwhile?

<table>
<thead>
<tr>
<th>Definitely</th>
<th>Possibly</th>
<th>Remains to be seen</th>
</tr>
</thead>
<tbody>
<tr>
<td>58%</td>
<td>24.6%</td>
<td>17.4%</td>
</tr>
</tbody>
</table>

**50%** plan to invest in 2015

Do you see an investment in BIM as worthwhile?

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</thead>
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<tr>
<td>38%</td>
<td>39.2%</td>
<td>20.3%</td>
</tr>
</tbody>
</table>

**10%** have no plans to invest in BIM

Barriers to investing in BIM (1-10, 10 being a significant barrier)

- Concerns about IP: 3
- Inadequate return on investment: 4.6
- No money available in budget: 5
- Don’t know which software to use: 5
- Too busy to research requirements: 5
- Too many products required: 5.4
- Lack of in-house expertise: 5.7
- No demand from contractors: 6.2
- No demand from consultants: 6.3
- Too expensive to develop: 8.6

**Reasons for investing in BIM**

- 40.7%: For commercial advantage
- 27.1%: Customer demand
- 11.9%: To get specified
- 8.8%: Business efficiency
- 6.5%: It’s the future
- 3.4%: Increase influence

**Peter Caplehorn RIBA**

Deputy CE and Policy Director CPA
Do you currently offer BIM content for your products?
Base: 199

- Yes, 40.2%
- No, 10.1%
- Plan to in 2015, 49.7%

Barriers to implementing BIM (score 0-10, where 10 is significant)
Base: 69

- Concerns about intellectual property: 4.7
- Investment required: 5.6
- Understanding the software options: 5.8
- Creating an understanding of the importance of BIM: 6.0
- Resource required: 6.1
Level of detail guidance can be defined for each deliverable.
Level of information guidance can be defined for each deliverable.
A definitions library of over 5,000 items across all construction disciplines will be provided.
Gas fired condensing boilers are described by characteristics such as duty, seasonal efficiency (gross calorific value (minimum)) and thermal performance testing. An example use may be within a medium temperature hot water heating system.

Uniclass2015 - Pr_60_60_08_34 Gas fired condensing boilers

Level of detail

Level of information

2

Requirement

Visual information to provide general principles of the design. Showing arrangement of system with their relationship to internal and external context, and key project criteria to suit a clients brief.

General descriptions would be expected to communicate principles of materiality, scope, colour and context. Expect strategic coordination with other professions to show general principles of the design.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Framed partition system design requirements</th>
<th>Structural performance</th>
<th>Fire performance to BS 476 13591</th>
<th>Fire performance to BS EN 13501</th>
<th>Acoustic performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partition P1019</td>
<td>Heavy duty partition with excellent acoustic ratings</td>
<td>HD</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>32 dB</td>
<td></td>
</tr>
<tr>
<td>Partition P1029</td>
<td></td>
<td>HD</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>35 dB</td>
<td></td>
</tr>
<tr>
<td>Partition P1030</td>
<td></td>
<td>HD</td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>38 dB</td>
<td></td>
</tr>
<tr>
<td>Partition P1040</td>
<td></td>
<td>HD</td>
<td>60 minutes</td>
<td>60 minutes</td>
<td>41 dB</td>
<td></td>
</tr>
</tbody>
</table>

NEXT
UK Government Digital Plan of Work

Stage 0: Strategy
Stage 1: Brief
Stage 2: Concept
Stage 3: Definition
Stage 4: Design
Stage 5: Build & commission
Stage 6: Handover & closeout
Stage 7: Operation & end of life
LoD: Concept Design, Transformer

Requirement:
Graphical representation of the equipment with approximate size, shape and location with provision for access and maintenance identified

Purpose of Information:
To provide a visual indication of proposals at a Concept stage identifying key requirements such as size, location, access / maintenance clearance, major services connections etc all supporting coordination
LoD: Technical Design, Partition

Requirement:
Graphical representation of Partition system, dimensionally accurate indicating primary performance characteristics (Fire Rating, Acoustic rating, security etc).

Typical / Installation information (Drop Sections / Details) separately produced linked to model element and adjacent constructions.

Purpose of information:
To provide a visual representation of proposals at a Technical Design stage supporting full spatial coordination and assisting with procurement.
Government Soft Landings

- Define outcomes and measures of success
- Identify & deliver user/ operator needs
- Asset Design & Construction
  - Design & Construction Commissioning, Training & Handover
- Measures
  - Financial Performance
  - Functionality & Effectiveness
  - Environment
- Asset Operations
  - Asset/Facilities Management
- Portfolio Planning - Benchmarks
- Establish Objectives & KPIs, Oper Budget
- Test and model, Operational Strategy
- Check and confirm plans & assumptions.
  - Market Engagement, Sourcing
- Handover, Training & Mobilisation
- Monitor and Evaluate - POE Yr.1
- Fully incorporate and explain - POE Yr.2

Collect and compare actual operational performance against planned targets

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NEXT
Level 2 working-
Use Pas 1192, series
Use DPOW
Use Tool kit and Uniclass 2015
Develop market and common practice
See returns from investment
Joined-up accurate data from 2016?
Level 3 is at least 9 years away for common use. Lots of time to perfect level 2.

ISO 19650 in development (PAS 1192). ISO Task groups in 30 countries CEN Standards being progressed International working (IFC’s) ‘Buildsmart’ around the world
Closing remarks -
Its all about the data
Accurate designs, Accurate performance
Fully proven performance, pre-build
Data for clients, business model
Data for future proofing, asset
Thank you

http://www.bimtaskgroup.org/

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