

# BIM - Learn The True Value of BIM In Operation

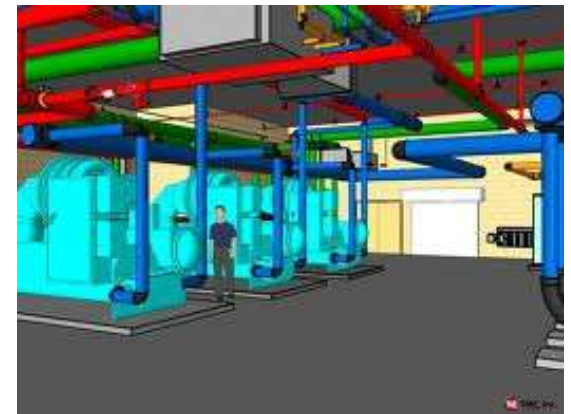


**Jo Harris**



# Contents

1. Understand the essence of BIM
2. How BIM relates to FM
3. How BIM can make FM more efficient
4. What to do next



# THE ESSENCE OF BIM

# DON'T PANIC



## Wikipedia:

‘**Building information modelling** (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of a facility.

The resulting **building information models** become shared knowledge resources to support decision-making about a facility from earliest conceptual stages, through design and construction, through its operational life and eventual demolition.’

‘A managed approach to the collection and exploitation of information’



# BIM

## Building Information Modelling

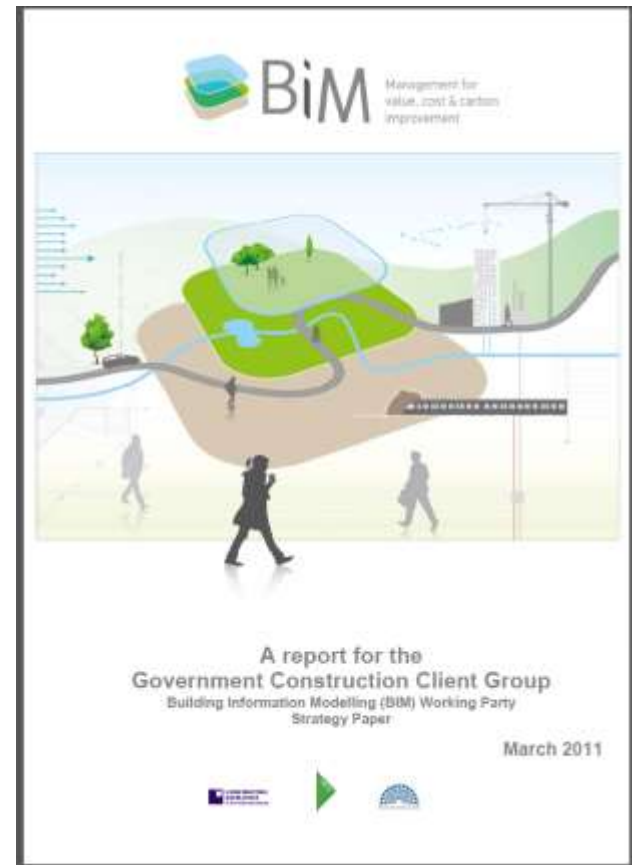
‘...a managed approach to the collection and exploitation of information **for projects...and assets**

**Better Information Management**

# SO WHY ALL THE FUSS?

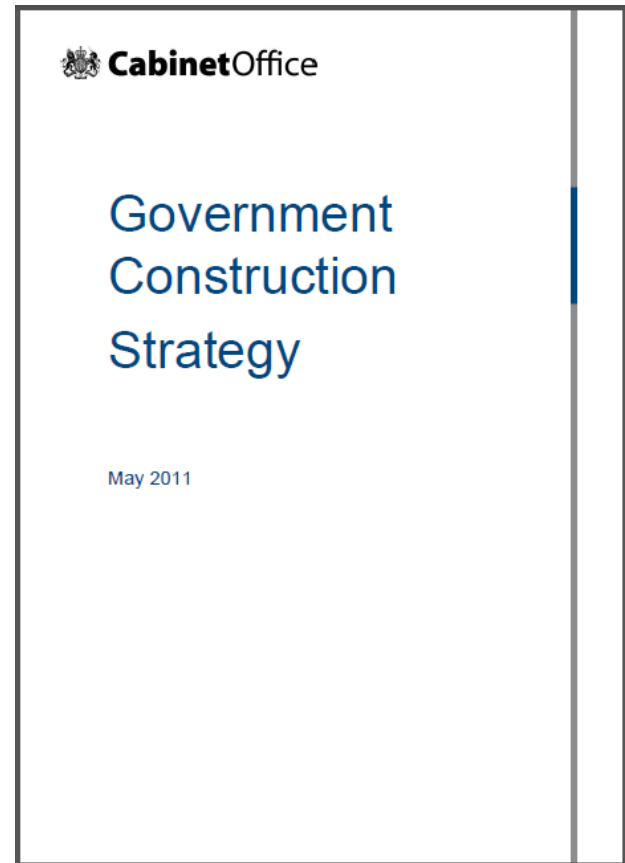


*A report for the UK  
Government Construction  
Client Group – Building  
Information Modelling (BIM)  
Working Party Strategy  
Paper* March  
2011



# *UK Government Construction Strategy*

May 2011



## 2 Strategy Objectives

- embed the adoption of a standardised prequalification form (PAS 01) so that it is used in all central Government construction procurement;
- identify and implement pilots to take forward the "leaning" of the procurement process for construction projects; and
- speed cash flow through the supply chain through fair payment provisions.

### Progress to May 2011

Prequalification - PAS 01: the use of this standardised wording for PQQs has been mandated within Government. Work to ensure that the approach is embedded within the procurement community, and spreads through the wider public sector, is ongoing.

Fair Payment and Project Bank Accounts: Fair Payment down the supply chain has been made a contractual requirement on all new construction procurement by central Government. In addition £1.8bn pounds worth of projects have been awarded to date using Project Bank Accounts, and these will be monitored as a model for the future.

### Building Information Modelling

2.29 At the industry's leading edge, there are companies which have the capability of working in a fully collaborative 3D environment, so that all of those involved in a project are working on a shared platform with reduced transaction costs and less opportunity for error; but construction has generally lagged behind other industries in the adoption of the full potential offered by digital technology.

2.30 A lack of compatible systems, standards and protocols, and the differing requirements of clients and lead designers, have inhibited widespread adoption of a technology which has the capacity to ensure that all team members are working from the same data, and that:

- the implications of alternative design proposals can be evaluated with comparative ease;
- projects are modeled in three dimensions (eliminating coordination errors and subsequent expensive change);
- design data can be fed direct to machine tools, creating a link between design and manufacture and eliminating unnecessary intermediaries; and
- there is a proper basis for asset management subsequent to construction.

2.31 The Cabinet Office will co-ordinate Government's drive to the development of standards enabling all members of the supply chain to work collaboratively through Building Information

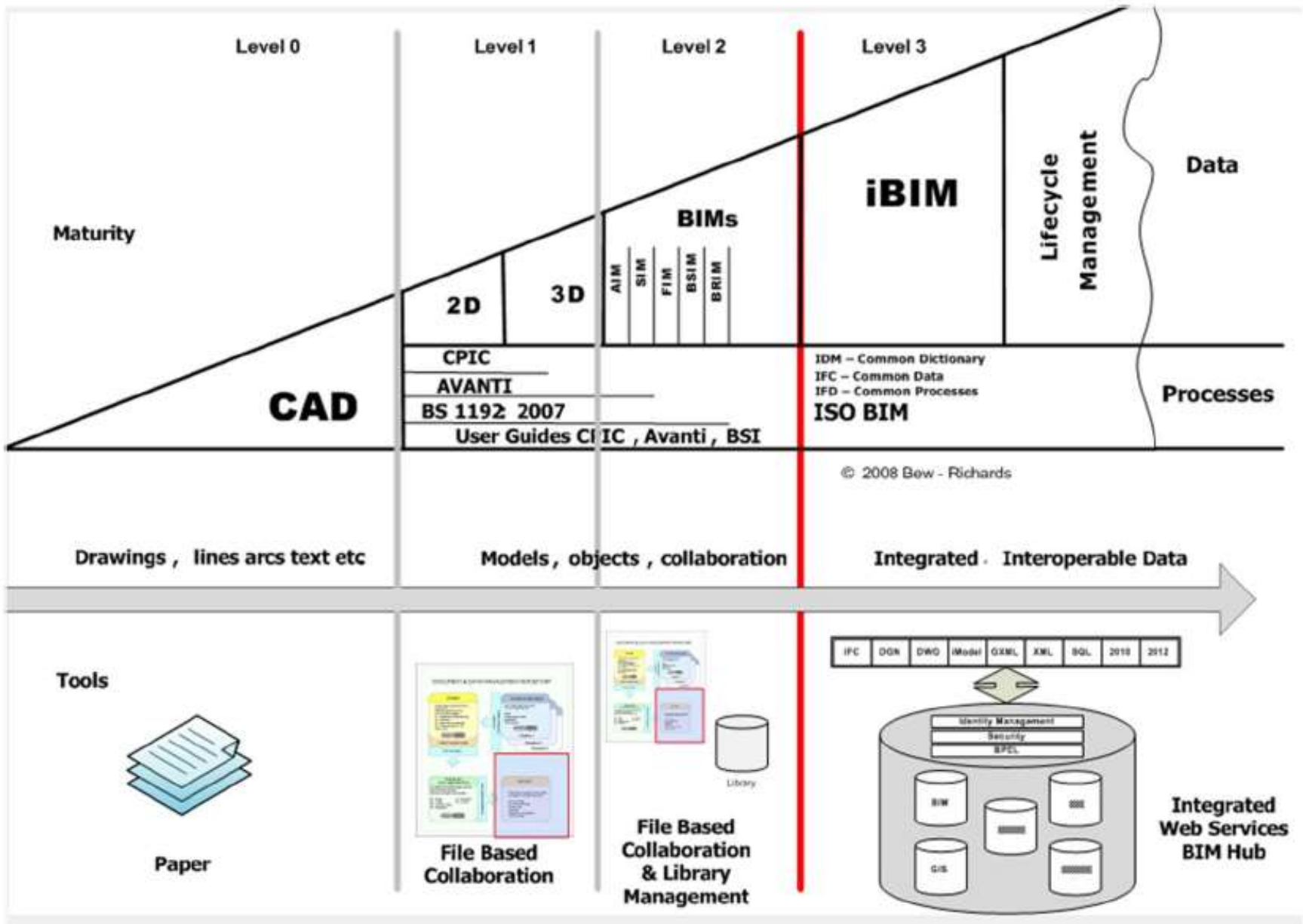
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## 2 Strategy Objectives

Modelling (BIM). This will be a phased process working closely with industry groups, in order to allow time for industry to prepare for the development of new standards and for training.

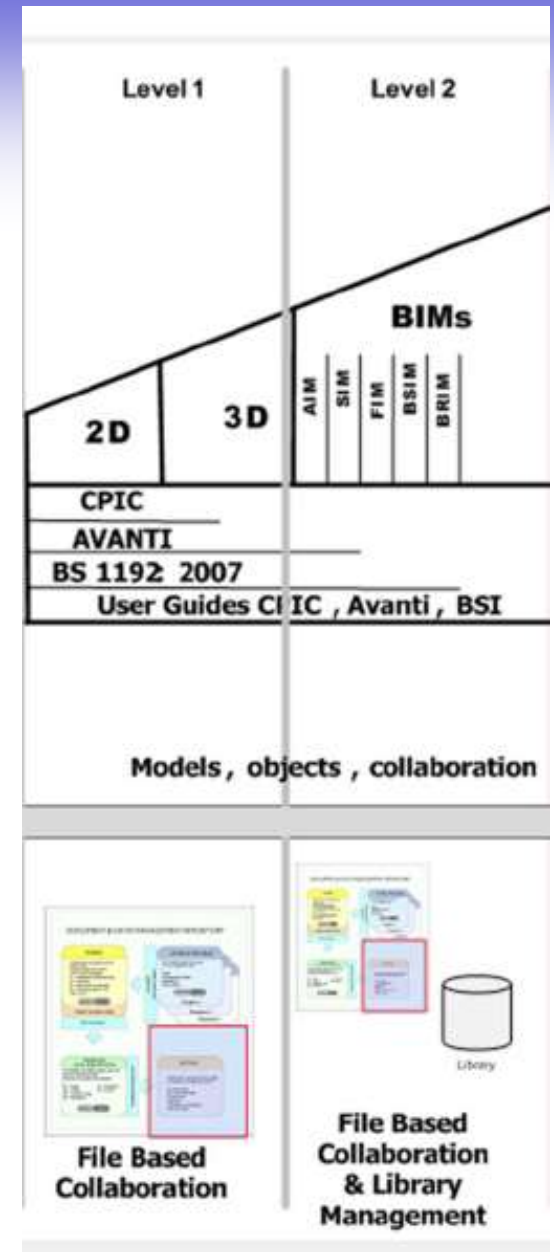
2.32 Government will require fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016. A staged plan will be published with mandated milestones showing measurable progress at the end of each year.

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# Level 2 maturity

- Managed 3D environment
- Held in separate discipline “BIM” tools with attached data
- Commercial data managed by an ERP
- Integration on the basis of proprietary interfaces or bespoke middleware could be regarded as “pBIM” (proprietary)
- The approach may utilise 4D programme data and 5D cost elements **as well as feed operational systems**



# The 8 components of BIM Level 2

1. PAS 1192-2 (Information management for projects)
2. PAS 1192-3 (Information management for assets)
3. BS 1192-4 (Information exchange)
4. PAS 1192-5 (Security) – due Summer 2015
5. BIM Protocol (Contractual amendments)
6. GSL (Government Soft Landings)
7. Digital plan of work
8. Classification

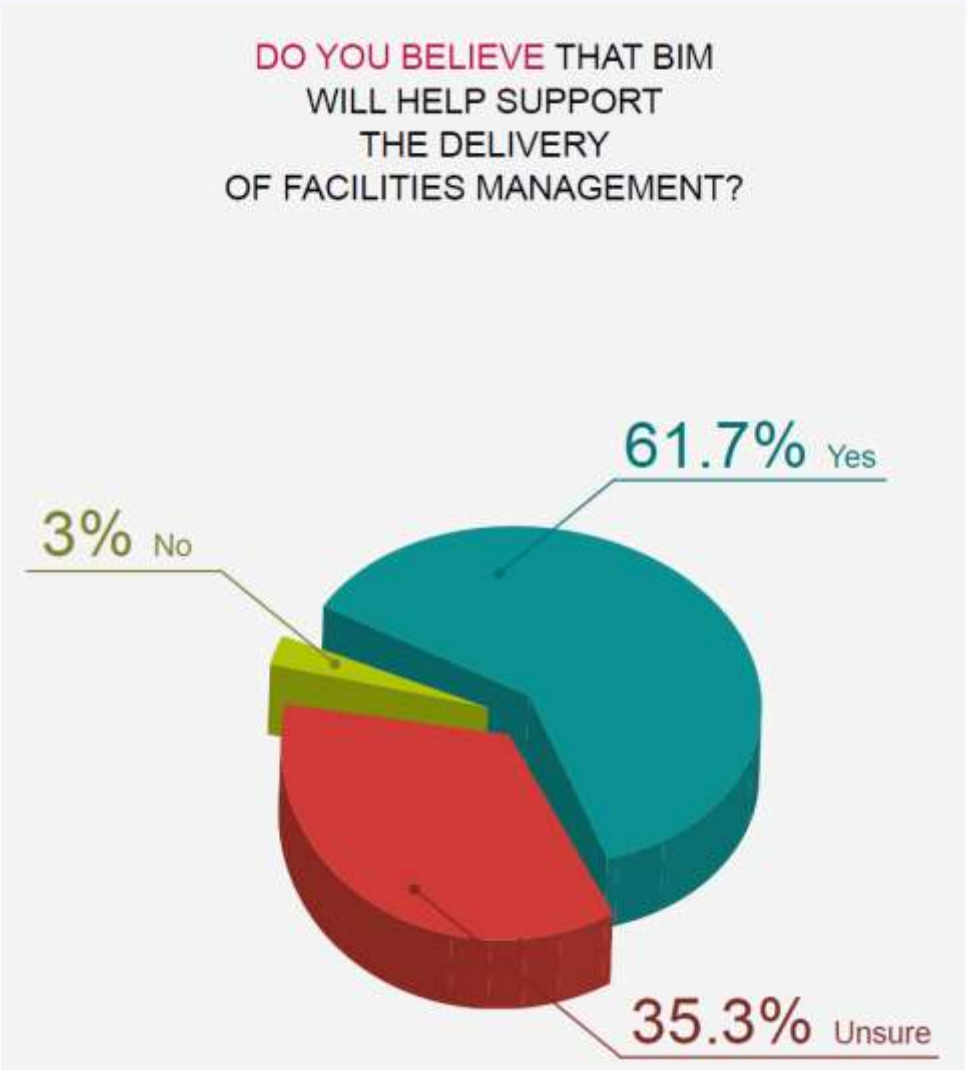
Items 1 - 4 are available free via <http://shop.bsigroup.com/>

Items 5 and 6 are available free via [www.bimtaskgroup.org](http://www.bimtaskgroup.org)

Items 7 and 8 are available free via <https://toolkit.thenbs.com/>

# HOW DOES BIM RELATE TO WHAT YOU DO?

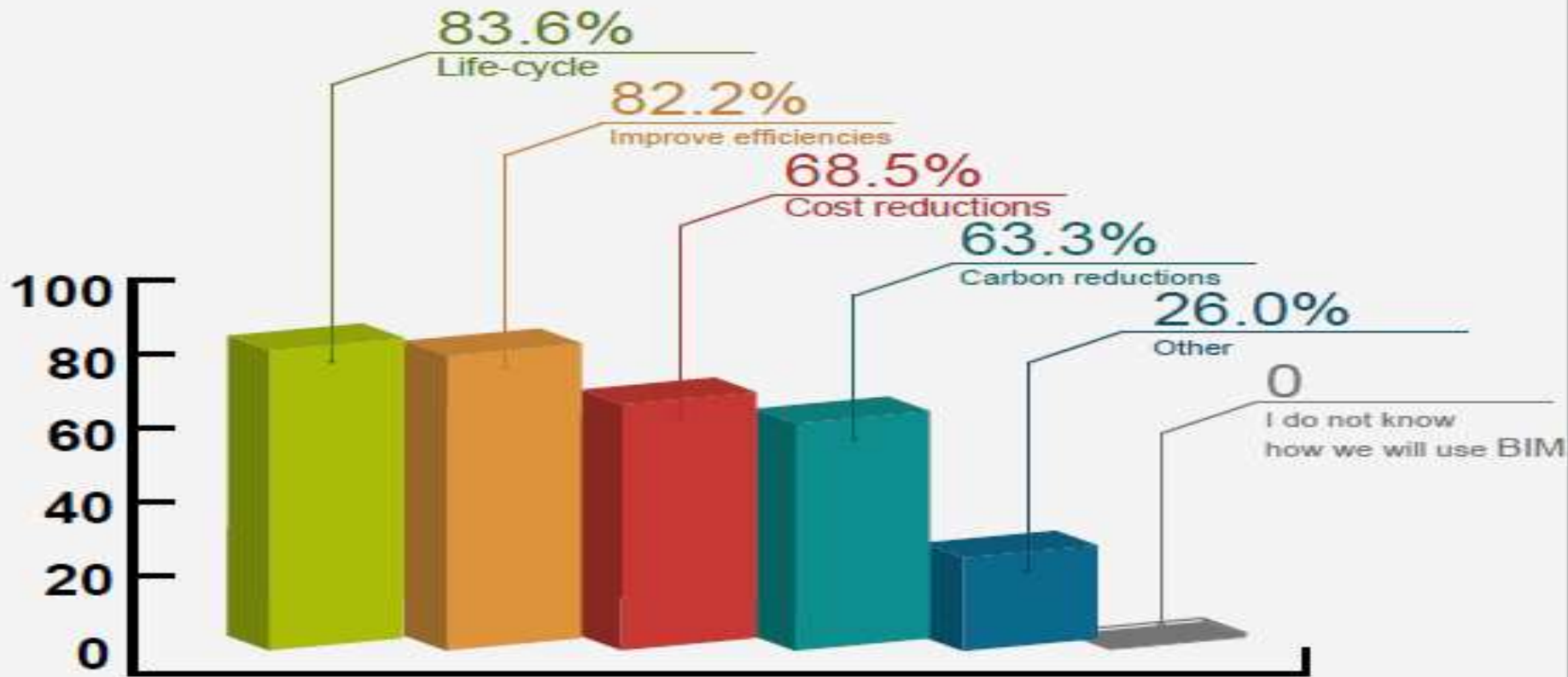
# BIM4FM





# Information to make better decisions

HOW DO YOU THINK YOUR COMPANY WILL USE BIM?



# What do FMs do?

## Operation

- Occupancy
- Operating environment
- Equipment
- Operating strategy
- Maintenance
- Health and Safety
- Security
- O&M manuals
- Master planning
- Strategy
- Space planning
- Infrastructure
- Cost management
- Legislation

# Information

## Pre-design

Correspondence →

Planning →

Feasibility →

Surveys →

## Design

Design reports →

Calculations →

Specifications →

Drawings →

## Construction

Schedule of rates →

RFIs →

Procurement →

Project planning →



## Operation

→ Occupancy

→ Operation environment

→ Equipment

→ Operating strategy

→ Maintenance

→ Health and Safety

→ Security

→ O&M manuals

→ Master planning

→ Strategy

→ Space planning

→ Infrastructure

→ Cost management

→ Legislation

# Potential for Operations

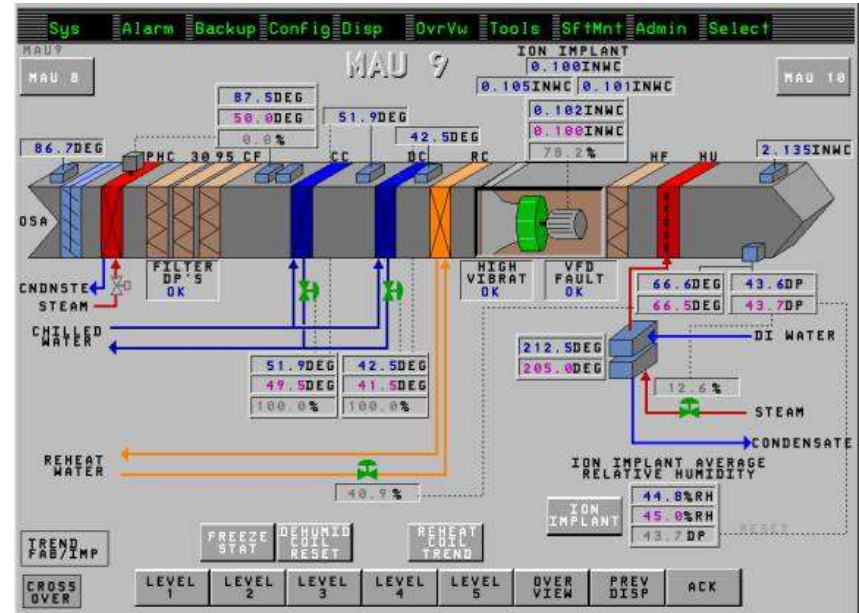
- FM engaged at start of construction projects
- Clear understanding of operational risk
- User focus during the construction process
- Competitive advantage in the FM supply chain



<https://www.bsria.co.uk/services/design/soft-landings/>

# What FMs need

- Design criteria
- Design strategy
- Control strategy
- Systems interactions (risks)
- Asset lists
- Maintenance tasks
- Performance metrics
- Costs



|             |        | Severity |        |        |
|-------------|--------|----------|--------|--------|
|             |        | Low      | Medium | High   |
| Probability | High   | Yellow   | Red    | Red    |
|             | Medium | Green    | Yellow | Red    |
|             | Low    | Green    | Green  | Yellow |

■ Low risk ■ Medium risk ■ High risk

# CAN BIM MAKE YOU MORE EFFICIENT?

## The purpose of BIM:

‘...generate a single piece of information which can be used 100 times...’

- A trusted source of information
- In the right format
- Verified and validated

# Asset information flow

PAS 55/ISO 55000 Standards Compliant

Defined Organisational Information Requirements

Project Supply Information

Service Supply Information

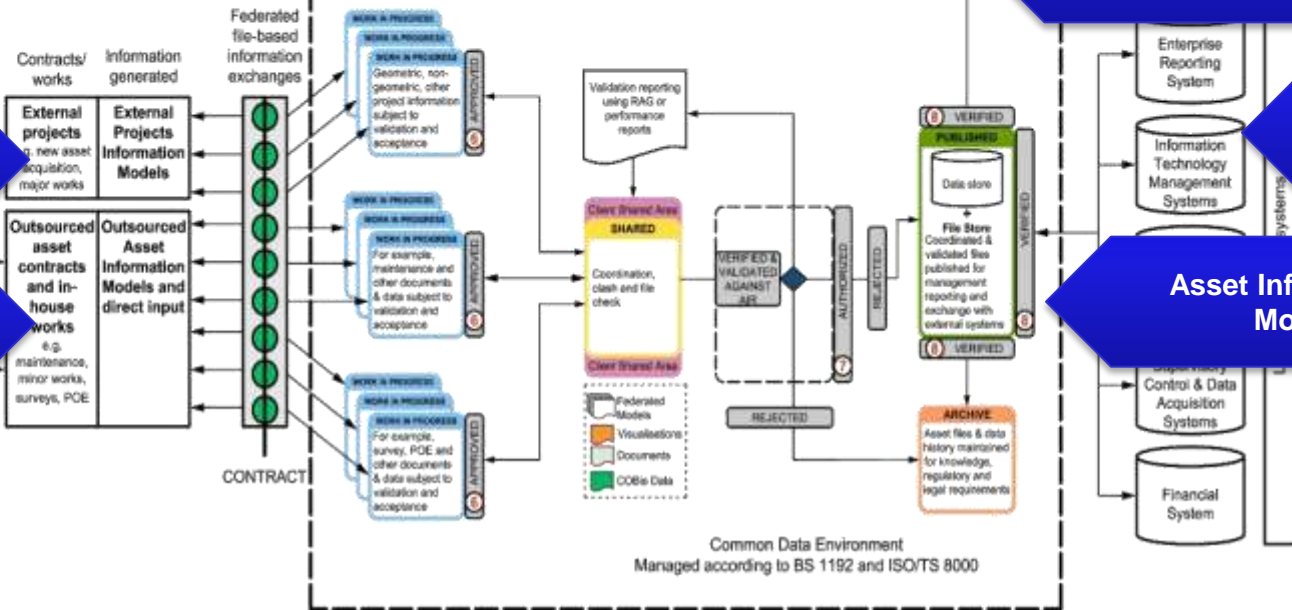
PAS 1192-3



Integrated Information Reporting

Enterprise System Integration

Asset Information Model (AIM)





# BIM technologies

BRIEFING

DESIGN

ANALYSE

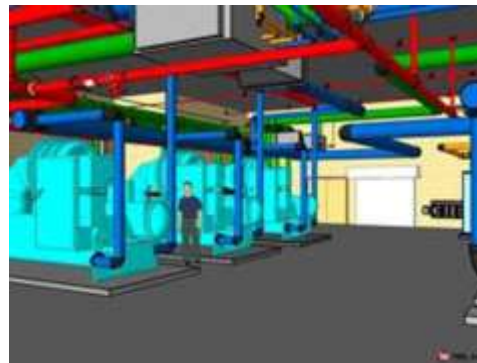
MANAGE

REVIEW

# Two aspects of BIM software

- **Authoring**
  - Designers
  - Contractors
  - Specialists
- **Accessing**
  - Clients
  - Facilities Managers
  - Designers
  - Contractors
  - Specialists
- **Wide range of software products**
- **Range of costs – free to £9k**
- **Range of features and capabilities**
- **Ensure the software selected can meet the output requirements**

- Aim is to capture all data/information about a asset for use throughout its life
- What information does the end user need, and in what format?
  - 3D models
  - Reports
  - Surveys
  - Drawings
  - Specifications
  - .....



# Typically NOT Included in the Model

- Correspondence
- Feasibility studies
- Site survey reports
- Technical specifications
- Contract conditions/forms of contract
- Design calculations
- Manufacturer's data
- Quotations
- Tender documentation

These must all be captured in the wider 'information model'

# Uses for BIM

- Trusted information source
- Down to supply chain and operations
  - CAFM tools
  - Equipment data
- Up to corporate level
  - Visualisation aiding communication
  - Master planning and strategy
- Using 'viewer' tools
- Accessing the data via mobile devices



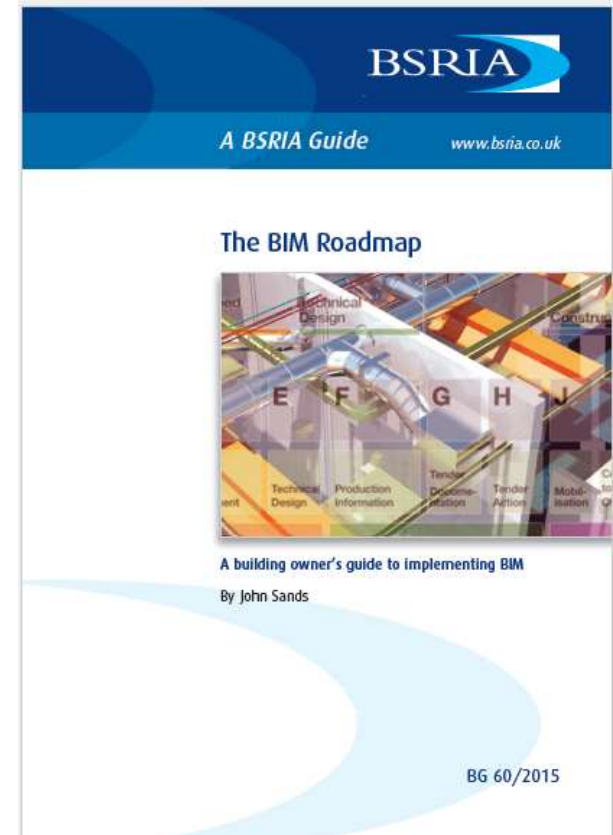
# The potential

- Strip the waste from processes, achieved by sharing information.... enabling right first time operation that meets the needs of the users
- Information about the use of the building which is informative to the operators
- Better buildings, with clear operational efficiencies and the best whole life value

# WHAT SHOULD YOU DO NEXT?

# Develop a BIM plan

- Your asset management strategy and plan
- Define your Organizational Information Requirements (OIRs)
- How are you going to keep the information up to date?





# A.3 Specific asset information requirements:

1. Legal
2. Commercial
3. Financial
4. Technical
5. Managerial

From PAS 1192-3, ISO 55000  
and BS 8587

PAS 1192-3:2014

### Annex A (informative) Guidance related to the information management process

**A.1 General**  
The Annex contains guidance to justify the requirements contained in Clause 4, to give those implementing the PAS some idea of what those requirements are intended to cover. Much of the detail is adapted from PAS 55-2.

**NOTE 1** (though PAS 55 has been superseded by the ISO 55000 series, PAS 55 has not been withdrawn at the time of writing and much of the content remains valid)

**A.2 Specific asset management activities**  
The following activities support the high-level activities contained in 4.4.

- asset accounting, activity costing, forecasting;
- planning and budgeting;
- demand management and customer expectation policy;
- capital investment and life cycle costing;
- renovation and change management;
- interfacing with regulatory bodies;
- asset operation or utilisation;
- asset modifications, refurbishment, replacement, reuse/redeployment, disposal, recycling;
- spares, materials and purchasing;
- data, information and knowledge management;
- contractor and supplier management;
- human resources, skills development and competences;
- maintenance, inspection, condition and performance monitoring;
- contingency planning and emergencies;
- energy efficiency and environmental aspects, e.g. renewable resources, recycling, waste management, air purity, hygiene;
- risk assessment and management;
- safety, health and environmental management.

**NOTE 2** The asset management activities above are adapted from PAS 55-2:2008 at A.3.1.

The following activities may assist in the definition of the O&M from 4.4:

- optimizing the asset management strategy and optimizing/prioritizing its asset management plans;
- assessing the financial benefits of planned improvement activities;
- modeling the asset to support operational decision making;
- determining the operational and financial impact of asset unavailability or failure;
- making life cycle cost comparisons of alternative capital investments;
- identifying expiry of warranty periods;
- determining the end of an asset's economic life, e.g. when the asset related expenditure exceeds the associated income;
- determining the cost of specific activities (activity based costing, e.g. the total cost of maintaining a specific asset/asset system);
- obtaining/calculating asset replacement values;
- undertaking financial analysis of planned income and expenditure;
- obtaining/calculating the financial and resource impact of deviating from plans that might result in a change in asset availability or performance (e.g. what is the financial impact of deferring the maintenance of a specific generator by six months?);
- assessing its overall financial performance;
- undertaking the on-going identification, assessment and control of asset related risks.

**NOTE 3** The O&M above are taken from PAS 55-2:2008, 4.4.6.

**NOTE 4** Some of these O&M might not be applicable to all organizations.

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# And finally....

- Initial setup
  - Define what information you want
- Keeping the information current
  - Needs to be up to date
- Updating the information
  - In-house resources
  - Outsource
  - Frequency



# Thank you

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Questions.....