

IN PARTNERSHIP WITH







FM Awareness of Building Information Modelling (BIM) AUGUST 2017





# Contents

Foroword

	rolew	JIU	
2		uction	
3		of respondents	
	3.1	International context	
4	The fir	ndings	
	4.1	Executive summary of findings	5
	4.2	General experience and impact of BIM on FM	6
	4.3	FM experience of preparing or using BIM related documents	7
	4.4	General perception and awareness of BIM	8
	4.5	Possible benefits of BIM to FM	<u>c</u>
	4.6	Other benefits	10
	4.7	Possible barriers and concerns to BIM adoption and use of BIM	11
	4.8	Other concerns	12
	4.9	Knowledge of UK BIM standards and guidance documents	13
	4.10	Other BIM Standards, Guidance or Tools	14
	4.11	Awareness of the UK government's BIM strategy	15
	4.12	Asset management and BIM in your organisation	17
	4.13	BIM training	18
5	Conclu	ısion, recommendations and BIFM's action points	20

# 66

The Asset and Facilities Management (A&FM) sector play a critical part in the safe, reliable and productive delivery of services across the nation. Approaching a third more money is spent each year on operational budgets than capital, but the investment in innovation and development is less.

The nation has to deliver reliable social infrastructure to drive productivity, growth and fiscal well being. Assets have two governing variables, capacity (provided during construction) and availability (managed by the A&FM sector). The data created as part of the design and construct process is of vital importance to the safe and effective delivery of an operational strategy. The value of data derived from BIM is rich in detailed content, which in future will provide insights previously un-thought of as we start to integrate active sensor and condition monitoring strategies and the potential disruptive maintenance opportunities this will provide (such as the concept of Uber FM).

This survey has provided a valuable insight to the current operations market in the light of the Governments Level 2 BIM intervention. By its very nature the A&FM market lags the capital phase but in common with our construction colleagues we are starting to see improvements in operational performance when digital strategies are employed, but of course it does take time for these savings to manifest.

The opportunities for Level 3 savings discussed above are vast, both in terms of sector productivity and impact on the nation, but for organisations to achieve this Level 2 is a vital first step, I would encourage you to start your digital journey as soon as possible."



**Dr Mark Bew MBE**Chairman,
Digital Built Britain

# 1. Foreword

# **BIFM** Perspective

66

BIFM has long recognised the vital role FM has to play within BIM projects and this is further highlighted within this report, this is why we formed our own Operational Readiness Steering Group in late 2015 to inform and develop a suite of guidance and knowledge materials to arm our members, and indeed the wider built environment industry, with the knowledge and skills they need to be operationally ready for BIM.

Our mission to equip FM practitioners with a thorough understanding of the purpose, value and benefits of BIM has been further underpinned by its recent incorporation into the FM Professional Standards, a change that reflects the growing impact it has on the working practices of our members as the industry adapts to the challenges and opportunities BIM will provide.

Therefore, whilst FM professionals begin to get to grips with BIM what it will mean for the profession the reality is that either now or in the near future they will be expected to operate in an area of innovation they may not necessarily know very much about, and ultimately that is why BIFM is acting now to bridge that knowledge gap and support our members.

This report introduces the work and partnership between BIFM, Liverpool John Moores University (LJMU) and Zurich University of Applied Sciences (ZHAW) and why BIFM see the work on BIM as important for the FM industry. The report presents the findings of the recent BIFM survey to benchmark the FM industry perception and awareness of BIM which the BIFM will use to help the development of further guidance material for our members."



# **Industry Perspective**

66

The application of BIM-enabled facilities management has the potential to add significant value to assets and estates.

There are, however, many challenges and barriers that need to be considered to make the transition easier and the benefits clear to all. The point stands though that by embracing BIM, the FM process becomes more efficient, not least because the required information is available in a structured and

integrated format. It is critical that clients engage in the BIM process to define what digital tools and processes they require in order to better manage their assets. This definition document is termed the Employers Information Requirements (EIR), BIM Academy supported BIFM in the creation of an example EIR that clients can use to become more informed in the BIM process."



# 2. Introduction

# Academic Perspective

The adoption and use of Building Information Modelling (BIM) in the whole life process of designing, creating and operating buildings, assets and infrastructure projects is a worldwide growing trend.

The research findings presented here aim to establish a benchmark of the current perception and awareness of BIM by facilities management professionals.



Simon Ashworth
Academic Researcher,
Institute of Facility
Management Zurich University
of Applied Sciences and
Liverpool John Moores
University



**Dr Matthew Tucker**Reader in Facilities Management,
Department of the Built
Environment Liverpool John
Moores University

BIM and other digital trends such as big data and sensors have potential wide-reaching implications for many industries including facilities management (FM). In April 2016 BIM became mandatory for UK government procurement projects in line with the Government Construction Strategy (2011). Its adoption and use was seen as a critical step to help achieve the ambitious cost, sustainability and trade targets set out in the Construction 2025 strategy (2013);

- 33% reduction in the initial cost of construction and the whole life cost of built assets
- 50% reduction in the overall time, from inception to completion, for newbuild and refurbished assets
- 50% reduction in greenhouse gas emissions in the built environment
- 50% reduction in the trade gap between total exports and total imports for construction products and materials

The Architectural, Engineering and Construction (AEC) industries have already started to adopt BIM as the new norm for procuring, designing and creating assets. There have been regular surveys in these sectors by NBS and other professional organisations regarding the awareness and development of BIM. However, to date the level of awareness and perception of BIM from a FM professional's perspective has not received the same level of attention. This presents a critical gap in research as clients and FM professionals are key to the start of the BIM process in terms of defining the OIR, AIR and EIR. It is essential that academia works closely together with professional organisations such as BIFM to help FM professionals in practice and to better understand how BIM might affect and help the FM industry. This has

never been more important as the role of FM in the BIM process is increasingly recognised as critical to realising the much talked about potential benefits of BIM.

Awareness of BIM is growing across the industry, but there are disparities in the level of sophistication, maturity and application of BIM in FM across specific organisations, sectors, industries, and countries. The growing importance of appropriate standards, professional guidance and academic research to bridge such gaps have never been more important. There is a growing body of international academic literature and industry reports pointing to the importance, and criticality of the involvement and integration of FM in the early design phase.

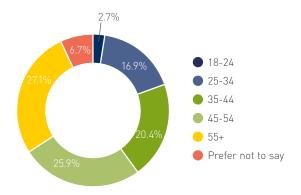
In order to ensure the FM industry is well prepared for engaging with other key stakeholders in BIM projects it is essential that the level of awareness of BIM and how facilities management professionals see BIM impacting on the FM industry are well understood. The results of the recent 'FM awareness of BIM' survey jointly undertaken between Liverpool John Moores University, the Zurich University of Applied Sciences and BIFM are published here to better inform industry. The aim is to help us understand how we can develop further BIM guidance material for BIFM members. Some guides have already been developed and published on the knowledge section of the BIFM website. These include the 'operational readiness' (BIFM 2016) of FM to implement BIM, the 'employer's information requirements (EIR): template and guidance' (BIFM 2017), and 'the role of FM in BIM projects' good practice guide (BIFM 2017).

# 3. Profile of respondents

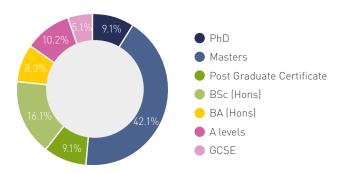
#### **KEY POINTS:**

- In total 254 people completed the online survey between 31 January and 15 March 2017.
- 22.4% of respondents were female, 72.4% were male, with 6.7% preferring not to answer.
- There was a balanced response across a wide range of ages and academic backgrounds.
- The majority of responses were from FM professionals but there was a great deal of input from other stakeholders involved in the whole life process.

#### **AGE**

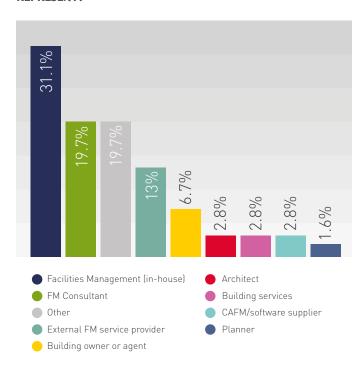


#### WHAT IS THE HIGHEST LEVEL OF ACADEMIC QUALIFICATION YOU HOLD?



There was a good range of representation from organisations of all sizes with some of the higher numbers being from the 1-9 range (16.1%), and then the other end of the scale with 1,000-4,999 (23.2%) and 5,000+ (23.6%). The remaining representation was from 10-49 (8%), 50-99 (7%), 100-249 (9%), 250-499 (6%) and 500-999 (7%).

#### WHAT STAKEHOLDER/INDUSTRY GROUP DO YOU REPRESENT?



Some stakeholders in the 'Other' category combined respondents from Academic/Researcher, BIM Consultants/Managers and FM Students/multi-disciplinary consultants (design & build).

There was a wide range of responses from various industry sectors with the higher number of respondents coming from the property sector (inc. real estate) and the education sector, both at (27.2%) followed by engineering, construction and manufacturing (23.2%) with management consultancy next at 18.1%.

# 3. Profile of respondents

#### 3.1 International Context

In terms of geographic representation there were many responses from the UK as well as across the globe. From the UK 16.1% indicated they were operating UK wide, 7.9% in London, 6.3% South East, 3.5% South West, 3% Scotland and 9.2% across the rest of the UK. The international input was a significant 53.9% from 28 different countries as indicated on the map below, with 10 respondents indicating a global reach.





**Dr Carsten Druhmann** Lecturer and Researcher, Institute of Facility Management: **Zurich University of Applied** Sciences Switzerland

"

Today we are facing old and new global challenges within the discipline of Facilities Management.

A major "new" trend is the wider digitisation of the core businesses of the organisations and companies who form our customer base. BIM has been perceived as one of these new trends. However, it is now more than just a trend, resulting in a global paradigm shift towards a more whole life focused approach and process for the design and creation of buildings and infrastructure.

The AEC industries have already adopted and are actively using BIM. How the FM industry will be prepared to be involved is a challenging question that we all need to think about if the promised benefits of BIM are to be delivered to our customers and wider society. Academics and practitioners need to share knowledge and experience across international borders to help prepare the FM industry for digitisation and BIM. We need more discussion and research to identify ways to prepare industry. From a neutral position universities and inter-trade organisations are in an appropriate position to support industry and public organisations to better understand how to implement BIM in an efficient way. As part of this the ZHAW in Switzerland have joined forces with LJMU and BIFM to help provide fundamental research to guide the creation of guidance for our global FM community."

# 4. The findings

# 4.1 Executive summary of the findings

#### **AWARENESS OF BIM:**

- A high number of respondents (91.7%) had heard of BIM with 83.5% believing BIM will help support the delivery of facilities management. 74% think BIM will have a significant impact on the FM industry with 83.8% indicating that BIM is already having an impact or will do so in the next five years.
- 81.1% (combined) strongly agree, or agree that BIM may offer companies, that adopt and use it, an advantage over those that do not. 83.9% (combined) strongly agree, or agree that "BIM has the potential to deliver significant added value to FM" and most people (84.3% combined) strongly agree, or agree, "BIM should help improve data transfer into CAFM systems".
- 72% say "the FM industry is not clear what BIM is" and 67.7% disagree or strongly disagree that the FM industry is well prepared to deal with BIM projects indicating more work needs to be done by the FM industry to ensure people are better informed about, and more prepared for BIM projects. This aligns with a high number of respondents (91.3%) who agree or strongly agree that facilities management professionals would benefit from more familiarisation with BIM to be able to define the outputs in the BIM process.
- 88.2% (combined) strongly agree, or agree BIM is about "an increased collaboration process and not just software models".
- 72% (combined) strongly disagree, or disagree that BIM is only for new-builds.
- Taking into account scores for strongly agree and agree (combined) the highest three ranking benefits of BIM to FM were perceived as 1) strategic decision making about asset maintenance and management,
  - 2) visualisation of buildings/assets for customers, health and safety and for maintenance and
  - 3) data transfer from construction into CAFM and other software tools.
- Likewise the highest three ranking concerns were perceived as:
  - 1) CAFM software suppliers should work on tools that allow bi-directional transfer of data between BIM and CAFM,
  - 2) BIM training and how facilities managers will access data in 3D models at handover and
  - 3) lack of training and cost of training associated with BIM.
- 66.1% believe that BIM will help the UK government meet its target for a 33% reduction in the initial cost of construction and the whole life cost of built assets with 54.3% being generally confident about the targets for 50% reduction in the overall time to complete projects. However, they were slightly less confident about the sustainability and trade targets.

#### **BIM EXPERIENCE:**

- 39.8% had some experience of being involved in a BIM project but of concern was that only 20.5% (combined) have direct experience of writing or implementing an Asset Management Strategy in line with ISO55000 or other system. As assets are often the second biggest expense to organisations after personnel, perhaps more focus should be given to defining strategy with respect to asset management and BIM.
- The number of people who had both "written and implemented" key documents used in the BIM process was generally low. The percentages were as follows; OIR (15.0%), AIR (18.9%), EIR (20.1%), BIM strategy (17.3%) and BEP (12.6%). This could be due to BIM being new to FM but might also indicate that more needs to be done to ensure the FM industry is equipped to write/implement key documents, which drive the start of the BIM process.
- 57.9% (combined) said that they agree or strongly agree "our employees would benefit from BIM certification or further BIM training courses". 28.3% were neutral and 13.8% (combined) disagree or strongly agree on this topic. This indicates a significant number of people who feel that
- When respondents were asked to indicate the level of BIM training and support in their organisation only 10.2% rated it as very good, the more troubling statistics came from the minimal and none respondents with 23.2% recording minimal and a massive 32.7%, almost a third recording none!



"

The use of BIM in FM operations by BAM FM provides a platform for improved maintenance planning, reactive responses and the quality of maintenance.

By combining 3D geometry with accurate data, instructions, and records for individual assets we can ensure that our employees have access to the information they need, where and when they need it. We also use BIM to participate in design and construction processes to make informed decisions on operational arrangements."

Reid Cunningham, Strategic Development Director, BAM FM Ltd

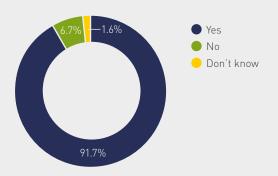
# 4.2 General experience and impact of BIM on FM

#### **KEY FINDINGS:**

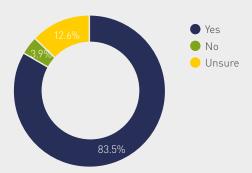
- Overall 91.7 % of survey respondents indicated they had heard of BIM before taking the survey, 6.7% had not heard of BIM and 1.6% were unsure. With respect to prior experience of BIM, 39.8% confirmed they had some experience of being involved in a BIM project whilst over half (52%) reported no experience (8.3% declined to answer).
- With respect to the question "Will BIM help support the delivery of facilities management?", the majority thought it would (83.5%), 12.6% were unsure and 3.9% believed not.
- When asked about the impact of BIM on the FM industry 74 % believe BIM will have a significant impact, 19.7% were not sure and only 6.3% believe it will not have a significant impact.
- 83.8% of respondents believe BIM is already having an impact on FM or will do so in the next five years, whilst 16.1% felt it would take more than 5 years.

#### THE IMPACT OF BIM ON FM:

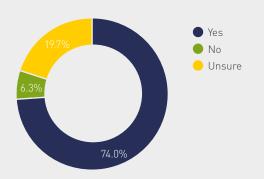
#### **BEFORE TAKING THIS SURVEY HAD YOU EVER HEARD OF BIM (BUILDING INFORMATION MODELLING)?**



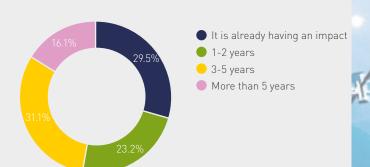
#### DO YOU BELIEVE THAT BIM WILL HELP SUPPORT THE **DELIVERY OF FACILITIES MANAGEMENT?**



#### DO YOU BELIEVE BIM WILL HAVE A SIGNIFICANT **IMPACT ON THE FM INDUSTRY?**



#### PLEASE INDICATE THE TIMESCALE YOU THINK IS **RELEVANT FOR THE IMPACT?**



# 4.3 FM experience of preparing or using BIM related documents

#### **KEY FINDINGS:**

- The results indicate not many people (12.2%) have experience of both "writing and implementing" an "Asset Management Strategy (e.g. ISO 55000 or other) and only a further 8.3% have implemented one written by someone else.
- In general the majority "knew of, but had not implemented/written" the key documents used in the BIM process, indicating that for many this would be a new challenge if they were to be involved in a BIM project. However only 13% indicated they would not be at all confident, and 18.5% indicated some concerns about confidence in preparing key BIM documents. This indicates the majority would be confident to engage in a BIM project and take on the roles of writing the documents.
- The percentage of respondents who have direct experience of writing and implementing the OIR (15%), AIR (18.9%), EIR (20.1%) and BEP (12.6%) for the BIM process is generally low. This could be due to BIM being new to FM but might also indicate that more needs to be done to ensure the FM industry is equipped to write/implement key documents which drive the start of the BIM process.
- As assets are often the second biggest expense to organisations after personnel, perhaps more attention should be given to ensure an asset management strategy is in place and people understand the organisations OIR and AIR before starting on the BIM journey.

R 0 IN

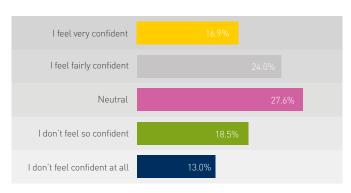
HAVE WRITTEN AND IMPLEMENTED	HAVE IMPLEMENTED BUT NOT WRITTEN	KNOW OF BUT NOT IMPLEMENTED/ WRITTEN	NO EXPERIENCE
12.2%	8.3%	38.2%	33.1%
17.3%	9.4%	34.6%	30.3%
15.0%	9.4%	33.1%	34.3%
18.9%	12.6%	31.5%	28.7%
20.1%	10.2%	26.4%	35.0%
12.6%	8.7%	30.7%	39.8%
	12.2% 17.3% 15.0% 18.9%	12.2% 8.3% 17.3% 9.4% 15.0% 9.4% 18.9% 12.6% 20.1% 10.2%	12.2% 8.3% 38.2%  17.3% 9.4% 34.6%  15.0% 9.4% 33.1%  18.9% 12.6% 31.5%  20.1% 10.2% 26.4%

8.3% of respondents did not answer this question

Respondents were also asked to rate how confident they would feel about engaging in a BIM project and taking on the review of key BIM documents such as the Organisational Information Requirements (OIR), the Asset Information Requirements (AIR), the Employer's Information Requirements (EIR) etc.

BASED ON YOUR CURRENT KNOWLEDGE/EXPERIENCE OF BIM, HOW CONFIDENT WOULD YOU FEEL ABOUT ENGAGING IN A **BIM PROJECT AND TAKING ON ROLES SUCH AS REVIEWING/** WRITING THE OIR, AIR, EIR ETC?

A positive finding was that a significant number of people (40.9%) feel "very" or "fairly confident" about engaging in a BIM project and writing the key documents. 27.6% were neutral but 31.5% felt "not so confident" or "not at all confident". For this 31.5% there is more work to be done to ensure they would feel positive about engagement in BIM projects.



# 4.4 General perception and awareness of BIM

#### **KEY FINDINGS:**

- 72% agree or strongly agree that "the FM industry is not clear what BIM is", and many, 67.7% disagree or strongly disagree that the FM industry is well prepared to deal with BIM projects. This indicates there is some more work to be done by the FM industry to ensure FMs are better informed about, and more prepared for BIM projects. This aligns with views that 91.3% agree or strongly agree that facilities managers would benefit from more familiarisation with BIM in order to define the outputs in the BIM process.
- Interestingly 80% (combined) of respondents strongly agree, or agree that BIM may offer companies that adopt and use it an advantage over those that do not.
- A high percentage (83.9% combined) of respondents strongly agree, or agree that "BIM has the potential to deliver significant added value to FM" and most people (84.3% combined) strongly agree, or agree "BIM should help improve data transfer into CAFM systems". This indicates a general positivity with respect to the potential benefits of BIM to FM.
- The findings indicate a significant number of responses (88.2% combined) strongly agree, or agree BIM is about "an increased collaboration process and not just software models". This is an important finding indicating that there is a general understanding about BIM as a process as opposed to software or
- Also of interest is that 72% (combined) of respondents strongly disagree, or disagree that BIM is only for new-builds. This indicates the majority also consider BIM can be used for existing buildings or refurbishments.

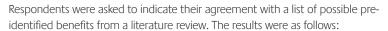


FROM YOUR AWARENESS AND UNDERSTANDING OF BIM, PLEASE INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENTS.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
The FM industry is not clear about what BIM is	17.3%	54.7%	16.9%	10.6%	0.4%
BIM is about a collaborative working process not just the use of BIM software model(s)	52.0%	36.2%	11.4%	0%	0.4%
FMs have a good understanding of the RIBA 2013 Plan of Work and its work stages	1.6%	10.2%	50.4%	32.3%	5.5%
BIM is only for new build, not existing buildings/assets or refurbishment projects	2.8%	11.4%	13.8%	41.3%	30.7%
BIM has the potential to deliver significant added value to FM	46.9%	37.0%	13.0%	2.8%	0.4%
The FM industry and FMs are well prepared to deal with BIM projects	0.8%	5.1%	26.4%	54.3%	13.4%
BIM should help improve data transfer into FM IT/CAFM systems	39.4%	44.9%	13.0%	1.6%	1.2%
BIM encourages early FM involvement in the design phase of projects to ensure the end users' needs are represented and give advice about life-cycle costing	39.8%	41.7%	14.6%	2.4%	1.6%
Companies adopting BIM may have a competitive advantage over those that do not	34.3%	45.7%	16.1%	2.4%	1.6%
FMs would benefit from more BIM familiarisation to help clearly define what they want in terms of outputs from the BIM process	49.2%	42.1%	7.9%	0%	0.8%

## 4.5 Possible benefits of BIM to FM

#### **KEY FINDINGS:**

- According to respondents the three highest ranking benefits of BIM to FM were perceived as:
  - 1) 87.8%: strategic decision making about asset maintenance and management.
  - 2) 87%: visualisation of buildings/assets for customers, health and safety and for maintenance.
  - 3) 86.6%: data transfer from construction into CAFM and other software tools.
- The findings indicate there is a perception that there may be a significant potential benefit of BIM to improve asset management strategy with improved data for CAFM and other FM systems. Many also felt there were significant benefits around visualisation of the virtual asset for a range of stakeholders and different reasons (maintenance, health and safety etc.).



PLEASE INDICATE YOUR LEVEL OF AGREEMENT OF POSSIBLE BE	NEFITS OF
DIM TO EM:	

BIM TO FM:	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Strategic decision making about asset maintenance and management	39.4%	48.4%	10.6%	0.4%	1.2%
Visualisation of buildings/assets for customers, H&S and maintenance issues	44.9%	42.1%	12.2%	0%	0.8%
Data transfer from construction into CAFM and other software tools for operation	41.7%	44.9%	11.4%	1.2%	0.8%
Cost management/transparency (whole life, maintenance and asset replacement)	42.5%	43.3%	12.2%	0.8%	1.2%
Operational efficiency (in terms of cost/time)	36.6%	47.2%	14.2%	0.8%	1.2%
Space and move planning capability	29.5%	48.4%	19.7%	1.2%	1.2%
Simulation capability e.g. energy, fire evacuations etc.	33.1%	44.1%	21.3%	1.2%	0.4%
Sustainability in terms of reductions in energy use/carbon emissions	23.2%	43.3%	29.9%	2.8%	0.8%
Insurance costs for buildings due to availability and accuracy of information	20.1%	38.2%	37.8%	3.5%	0.4%



"

It is imperative that FM becomes involved in the BIM process from the start.

Our ability to support the strategic goals of organisations through effective delivery of lifecycle asset management provides much of the key data needed to formulate and describe the BIM requirements. BIM is no longer just a design led concept."

Steve Owen MBA CBIFM, Managing Director, FM180 Ltd

## 4.6 Other benefits

Respondents also identified a wide range of other possible benefits of BIM to FM. Some examples of other key themes identified were;

#### IMPROVED STRATEGIC ASSET PLANNING AND DECISION-**MAKING:**

- Asset and risk based maintenance will be improved due to the level of confidence of data about assets developed during the BIM
- Clients, FM professionals and investors should be able to make better-informed business and investment decisions before they invest in, or build assets by using the data and information in a virtual context created during the BIM process which reduces risk.
- The integration of the operational and maintenance stakeholders early in the design phase will push maintainability and cost reduction in O&M and ensure more complete transfer of O&M
- BIM will enable improved "cradle-to-cradle" strategies and projects will be better able to forward plan the dismantling of buildings or building parts with less waste and more possibilities to re-use
- The information from the BIM process will help FM in leasing, subtenant management, space utilisation and strategic decision

#### **BETTER WORKING CULTURE FOR ORGANISATIONS AND PROJECTS:**

- The BIM process should help overcome some traditional barriers, improve the tender process and encourage more involvement and cooperation between the various stakeholders in the whole life process. Respondents also mentioned collaboration and efficiency increased by everyone talking the same language.
- The BIM process (if planned properly) should help FM professionals ensure better handover of data at transition from construction to operation and their CAFM tools are well populated with relevant and useful data.
- If a standardised approach can be adopted by developers, installers and asset manufacturers then whole life modelling and lifecycle replacement can be effectively integrated in to CAFM for future
- BIM will help FM companies validate, verify and comply with client's services and asset strategy.

#### **NEW WAYS OF WORKING/TECHNOLOGY:**

- Examples of other benefits of BIM include using the information and model to plan and help with way-finding systems and placement and use of sensor and other new technologies.
- BIM can provide a common, visually based communication platform for improving clarity and understanding among all project-related constituencies, including marketing to potential
- Using BIM together with virtual/augmented reality will help FM professionals' plan and run scenarios. This could include maintenance and planning for emergencies etc.
- Allows for remote maintenance of a greater number of buildings, which cuts down on numbers of FM staff.

#### **EDUCATION:**

- BIM will help the overall education of those responsible for FM for their clients, as the general level of education and understanding of what FM is (and not) is quite low.
- BIM can help to emphasise that FM is a management discipline; overseeing and co-ordinating the efforts of others as opposed to the operational delivery of services.

However, some feedback indicated that respondents have "concerns around the cost and complexity of ongoing maintenance of BIM models and their associated data". Some people were "sure that BIM has potential benefits for FM", but stated, "We should really research the FM processes and their real data and information needs and their relationship to BIM". One respondent commented, "FM teams will require skills and support systems to maintain the model of the building in a suitable up-to-date format such that ongoing revisions are incorporated and are valid". Another respondent observed "BIM is unlikely to be a 'silver bullet' but it has a high potential for improvement in the format of data".

# 4.7 Possible barriers and concerns to BIM adoption and use of BIM

#### **KEY FINDINGS:**

- In this section the highest three ranking barriers/concerns were perceived as:
  - 1) 72.5%: CAFM software suppliers should work on tools that allow bi-directional transfer of data between BIM and CAFM.
  - 2) 71.7%: BIM training and how facilities managers will access data in 3D models at handover.
  - 3) 68.1%: lack of training and cost of training associated with BIM.
- The findings highlight a need for CAFM software suppliers to help industry more. This might be addressing the issue of bi-directional data exchange between BIM-CAFM and how the plans to manage and capture data in the BIM process can be improved up to the point of handover. This was reflected in concerns about training and how facilities management professionals can access and keep data up to date between the BIM models and their CAFM systems.
- Also of interest was that many respondents noted their concerns as neutral with respect to the use of COBie for transfer into CAFM/other systems and the impact of BIM from a legal perspective. This might indicate that they see COBie as just part of the process. With respect to the legal concerns these did not feature very prominently. This might be because legal BIM clauses are not so common in standard types of contract and perhaps this is something that industry needs to consider.

PLEASE INDICATE YOUR AGREEMENT WITH POSSIBLE CONCERNS/ BARRIERS RELATING TO BIM	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
I feel I need more knowledge about BIM before being involved in a BIM project	20.1%	40.9%	18.9%	12.6%	7.5%
I don't feel our organisation is adequately prepared to engage in BIM projects	14.2%	37.0%	22.8%	19.3%	<b>6.7</b> %
The cost of adopting/implementing BIM	13.4%	39.8%	32.3%	13.0%	1.6%
Ability of FM to write/specify the OIR, AIR and EIR documents for a client	14.6%	46.9%	30.3%	6.3%	2.0%
Management/collection of data in the BIM process	13.4%	49.2%	26.8%	9.8%	0.8%
Using COBie for transfer of data into CAFM/other systems	12.2%	30.3%	46.1%	10.2%	1.2%
The impact of BIM from a legal perspective	10.6%	20.1%	51.2%	17.3%	0.8%
CAFM/software suppliers should work on tools that allow bi-directional transfer of data between the BIM and CAFM	33.1%	39.4%	22.8%	4.3%	0.4%
BIM training and how FMs will access data in 3D BIM models at handover	26.0%	45.7%	22.4%	4.7%	1.2%
Lack of/cost of training	23.6%	44.5%	24.4%	7.1%	0.4%



Building Information Modelling (BIM) engages the facilities and building operational professionals from inception throughout the design and construction processes.

It allows them to consider and specify their holistic asset data and information requirements in line with their current and future asset management strategies, quality and data management systems."

Jason Clark, UBS Regional Head of Property Management

#### 4.8 Other concerns

Respondents also identified a range of other concerns relating to BIM. Some examples of themed concerns identified were;

#### **ENGAGEMENT, COOPERATION AND EFFORT REQUIRED**

- FMs need to play a pivotal role and "be on board" with BIM.
   Automation and digitisation will have a big impact on how FM is delivered, but FM services will still be required even if the method of delivery changes and BIM needs to work with the way FM services are delivered.
- The lack of a transparent understanding from clients/owners as
  to why they should invest in BIM during early project stages often
  means they are reluctant to invest. To this end education for all
  clients on what BIM is and how it can help them, is a must.
- The pay back for the investment required is never mentioned and has not been qualified except with a 'utopian' view that does not reflect day-to-day operational reality.
- FM organisations have fast-pace day-to-day operations, therefore allocating FMs to BIM projects may require a considerable time away from daily operations during the first deployment in order to get their attention and feedback. Not all organisations can dedicate that time concentrated for a year or a few months.
- Traditional work cultures may hinder the implementation of BIM.

#### **CAFM, BMS AND BIM:**

- The ability to accept the level of detail required via COBie is ok in the short term however; CAFM developers need to work now to not only accept COBie style data but also integration with IFC.
- CAFM suppliers should demonstrate how data can be "bi-directional between the systems" – There needs to be an understanding/ clarification of what needs to be pushed back from CAFM into BIM.
- CAFM needs specific workflow to integrate CAD departments in change process, we need to ensure that there is a link with the BMS in the BIM planning process.
- I believe the biggest roadblock is lack of appropriate tools (software) for FM.

#### **VALUE AND USABILITY OF MODELS:**

- Clients need to invest in BIM models for them to be of value. How many O&M's and record drawings are out of date within years of a building being occupied? Unless BIM management becomes a budget line in client's annual costs then BIM will not provide value in the operational phase.
- Unless properly managed the BIM models have limited use in operations.
   We need to ensure a significant review of operational procedures to ensure that the data is used and maintained.
- Construction professionals need to ensure BIM models reflect reality.
   There needs to be a cultural change to understand what data is important and provides value and then a culture of keeping it valid and current.
- FMs seldom if ever need 3D BIM in their activities. We should not try
  to force them to learn things which are not beneficial for them, but
  analyse what they really need in their daily work and how that might be
  connected to the information in BIM but using a relevant user interface.
- We really need more case studies to show real positive value add and contribution to efficiency of FM operations.
- Soft landings needs to be integral to this process to ensure life cycle of assets is optimised and to minimise energy usage reducing the carbon footprint
- I am concerned that only the larger practices will be able to afford the

- staff to work in the BIM format, especially for the first few years
- BIM is a tool but not the lead tool for the control for the built
  environment the devil is in the detail and to ensure BIM is really useful
  it needs to take account that in operation there is a more systems
  orientated approach.
- Employing people to keep the information up to date.



66

BIM is just as valuable to facilities and asset management professionals as it is to project clients.

The standards developed as part of BIM Level 2 spell out what FMs need to do to unlock this value. PAS 1192-3 provides a strategic framework explaining how information directly responds to the owner's/user's business needs, while BS 8536 provides recommendations for specific information deliverables needed by FM professionals at each stage of a project."

David Churcher, Director, Hitherwood Consulting Ltd

# 4.9 Knowledge of UK BIM standards and guidance documents

#### **KEY FINDINGS:**

- In general the findings indicate significant numbers of people were not aware of the UK BIM standards or maybe "had heard of them but not read them". However this result may be skewed by the high level of international respondents who understandably might not be so familiar with UK standards.
- With respect to the standards and guidance that scored higher it was interesting (and probably expected) that people were more familiar with those not just specific to BIM. Using combined scores, in terms of people indicating they "know them", and some "use in practice"; the top three ranked were The RIBA plan of Work\*1 (32.3%), ISO 55000\*2 Asset Management (28.7%) and ISO 15686-5\*3 Life Cycle Management (25.9%).
- With respect to specific BIM standards and people indicating they "know them", and some "use in practice"; both PAS1192-2 and PAS 1192-3 scored highest registering 23.2%. This shows a balance of familiarisation from both a construction and operation
- Perhaps of concern was the relatively low familiarisation with BS-8536 (Parts 1 and 2) which scored low at 16.5% and 13% respectively. As two key documents guiding FM professionals in helping brief design teams and integrate the principles of soft landings perhaps more work needs to be done to promote these documents.

PLEASE INDICATE YOUR LEVEL OF KNOWLEDGE OF THE FOLLOWING KEY UK BIM RELATED STANDARDS AND GUIDANCE DOCUMENTS	KNOW AND USE IN PRACTICE	KNOW WELL BUT DON'T USE IN PRACTICE	HAVE A BASIC OVERVIEW BUT DON'T USE IN PRACTICE	HEARD OF BUT HAVE NOT READ	NOT AWARE OF
RIBA 2013 Plan of Work <sup>*1</sup>	16.9%	15.4%	16.1%	16.1%	35.4%
ISO 55000 (1/2/3) - Asset Management <sup>*2</sup>	12.2%	16.5%	22.8%	24.0%	24.4%
PAS 1192-2:2013 - Specification for information management for the capital/delivery phase of construction projects using BIM	11.0%	12.2%	15.7%	19.7%	41.3%
PAS 1192-3: 2014 - Specification for information management for the operational phase of assets using BIM	10.6%	12.6%	16.5%	18.9%	41.3%
BS 8587:2012 Guide to facility information management	10.6%	10.2%	16.9%	22.8%	39.4%
ISO 15686-5 - Life Cycle Management <sup>'3</sup>	9.4%	16.5%	24.0%	22.0%	28.0%
BS 1192:2007+A2:2016 - Collaborative production of architectural, engineering and construction information – code of practice	9.1%	7.5%	18.9%	20.9%	43.7%
BS1192 part 4:2014 - Fulfilling employers information exchange requirements using COBie – Code of practice	7.5%	11.4%	16.5%	20.9%	43.7%
CIC suite of BIM documents; Professional Indemnity Insurance, Scope of Services for the Role of Information Management and BIM Protocol	6.3%	9.1%	14.6%	17.3%	52.8%
PAS 1192-5: 2015 Specification for security-minded BIM, digital built environments and smart asset management	5.5%	10.2%	18.5%	21.3%	44.5%
BS 8536-1:2015 Briefing for design and construction –Part 1: Code of practice for facilities management (buildings infrastructure)	5.1%	11.4%	22.0%	20.9%	40.6%
BS 8536-2:2016 Briefing for design and construction. Code of practice for asset management (Linear and geographical infrastructure)	4.3%	8.7%	20.1%	21.7%	45.3%

## 4.10 Other BIM Standards, Guidance or Tools

Respondents were also asked about any other BIM standards, guidance or tools which they considered useful references for facilities managers.

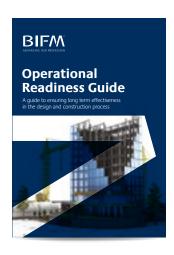


#### **KEY FINDINGS:**

- The research findings indicate that facilities management professionals and other stakeholders around the world are using a wide range of both UK and international BIM standards and guidance documents.
- The BIFM guidance documents for BIM were referred to in additional feedback from respondents as a good starting point for FM professionals interested in knowing more about the BIM process.
- Government Soft Landings (GSL) and adopting the principles contained within the BSRIA soft landings guidance was also mentioned by several respondents as very important to FM professionals and ensuring the BIM process starts as it should
- Guidance and tools developed by other professional associations such as NBS, CIBSE, RICS, NBIMS (US), GSA (USA), SIA (Switzerland), CoBIM (Finland), EU BIM Task Group were also seen as good reference for learning more about BIM.

#### PLEASE GIVE DETAILS OF ANY OTHER BIM GUIDANCE DOCUMENTS/TOOLS WHICH ARE NOT LISTED ABOVE WHICH YOU USE/THINK ARE USEFUL REFERENCE FOR FMs

- Government Soft Landings Policy
- BIFM Operational Readiness Guide
- BIFM Good Practice Guide "The Role of FM in BIM Projects"
- BIM Guide 08 Facility Management GSA
- GSA BIM requirements
- COBIM 2012
- BIM Handbook of EU BIM Task Group
- Penn State BIM Execution Plan
- National BIM standard version 3 (National Institute of Building
- NBIMS standard, especially part 4.2 (COBie)
- NBS BIM Toolkit (digital Plan of Work and Uniclass 2015)
- CIBSE life cycles, PDTs
- RICS suite of information and their BICS service
- Switzerland SIA 2051: building information modelling (in development)







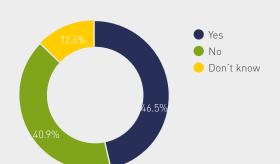


# 4.11 Awareness of the UK government's BIM strategy

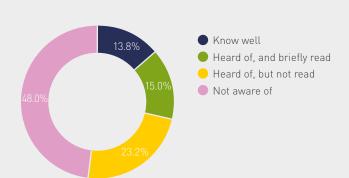
#### **KEY FINDINGS:**

- The findings show overall 53.5% of respondents are aware of the UK government mandate to adopt and use BIM level 2 on government procurement projects (effective from April 2016). If this figure had been based on UK responses only the expectation is that it would have been higher. However, considering the high international response the figure can still be considered quite high.
- Many (40.9%) globally are still not clear about the different levels of BIM. Feedback from comments indicate this might be partially due to confusion in connection with different "dimensions of BIM"; i.e. 4D (time/project information), 5D (cost data) and 6D (facilities management).
- Taking into account the large international response it was interesting that significant numbers were familiar with the UK governments "Digital Built Britain - level 3 strategy", 15% having heard of and briefly read it and a further 23.2% having heard of but not yet read it.
- 24% had also accessed the Digital Built Britain website, with 34.2% and 28% the BIM Task Group and BIM Level 2 websites respectively.

#### THE GOVERNMENT HAS DESCRIBED THERE BEING DIFFERENT LEVELS OF BIM. ARE YOU AWARE OF THESE DIFFERENT **LEVELS?**



#### ARE YOU AWARE OF THE GOVERNMENT "DIGITAL BUILT **BRITAIN - LEVEL 3 STRATEGY"?**



EARD OF, AND

Respondents were also asked if they were aware of a series of government websites (linked to the UK BIM task Group) with the purpose of supporting and helping disseminate information about BIM.

#### ARE YOU AWARE OF THE FOLLOWING WEBSITES (LINKED TO **GOVERNMENT BIM TASK GROUP)?**

		_	<b>-</b> 8		_
BIM Task group	www.bimtaskgroup.org	18.1%	16.1%	13.8%	52.0%
Digital Built Britain	www.digital-built-britain.com	10.2%	13.8%	16.5%	59.4%
BIM Level 2	www.bim-level2.org	12.6%	15.4%	14.6%	57.5%

# 4.11 Awareness of the UK government's BIM strategy

The respondents were asked for their views on whether they believed BIM would help the government meet their key strategy targets set for 2025.



- Over half of respondents were generally confident (66.1%) that BIM will help the government meet its target for a 33% reduction in the initial cost of construction and the whole life cost of built assets.
- There was general confidence (54.3%) about the targets for 50% reduction in the overall time to complete projects.
- Results showed that there was a bit less confidence about the sustainability and trade targets.
- Further comments in the research indicate this might be due to a lack of well documented case study evidence. Some comments indicate the lower figure for the trade gap target might relate to people maybe not making a direct connection between BIM and reducing the trade gap.



66

THE UK GOVERNMENT HAS SET OUT ITS STRATEGY FOR UK

The FM and Asset Management Industry has played a significant role in the delivery of the Construction Strategy especially in the advancement of Soft Landings and BIM where the needs of the end-user has been considered and addressed throughout a digitised design process and data and information to support the operational and asset strategy defined through the integration and early involvement of FM players who have become the golden thread in the asset life-cycle."

## David Philp, Global BIM Consultancy Director AECOM and Chair Scottish BIM **Delivery Group**

CONSTRUCTION IN 2025. THE STRATEGY INCLUDES FOUR TARGETS. PLEASE TELL US THE ROLE YOU THINK BIM WILL HAVE IN OUR ACHIEVING THE FOLLOWING:	BIM WILL HELP	BIM WON'T MAKE A DIFFERENCE	BIM WILL HINDER	DON'T KNOW
33% reduction in the initial cost of construction and the whole life cost of built assets	66.1%	5.5%	0.8%	27.6%
50% reduction in the overall time, from inception to completion, for newbuild and refurbished assets	54.3%	13.0%	2.0%	30.7%
50% reduction in greenhouse gas emissions in the built environment	40.2%	24.8%	0.4%	34.6%
50% reduction in the trade gap between total exports and total imports for construction products and materials	20.9%	33.1%	0.8%	45.3%

# 4.12 Asset Management and BIM in your organisation

#### **KEY FINDINGS:**

- A worrying trend was that a significant number of people (25.2%) indicated their organisations do not have a formal asset management strategy (e.g. ISO 55000 or other) "in place". Another 22.4% of people indicated they "didn't know" if their organisation had an asset management strategy. A further 11.0% indicated that where an asset management strategy was in place "it was not well used". Interestingly a further 12.2% indicated they were "considering implementing" an asset management strategy. These overall figures show that many organisations do not have an asset management strategy in place or one which is well used and managed. This is an issue that maybe needs to be more widely addressed as any organisations intending to use the BIM process need to have their asset management strategy in place as a fundamental starting point for the BIM process.
- With respect to key BIM documents a relatively low range of percentages (8.7% 16.1%) were indicated against the various documents being "in place and is well used". Interestingly roughly a quarter of people indicated they were "not in place", and a further quarter indicated they "did not know". These figures might reflect people not yet being aware of the BIM process and associated acronyms.
- The indication around there being "no requirement" for BIM strategy or documents was roughly between 15.4% - 19.7%. Further comments from the survey indicate this might be due to respondents (and their organisations) not yet having any involvement in a BIM project or the BIM process.





DOES YOUR ORGANISATION HAVE THE FOLLOWING IN PLACE?	IN PLACE AND IS WELL USED	IMPLEMENTED BUT NOT WELL USED	CONSIDERING IMPLEMENTING	NOT IN PLACE	NO REQUIREMENT	DON'T KNOW
Asset Management Strategy (eg. ISO 55000 or other)	12.2%	11.0%	12.2%	25.2%	19.7%	22.4%
BIM Strategy	15.4%	7.1%	14.6%	29.1%	18.5%	18.9%
BIM processes	16.1%	7.5%	15.7%	29.5%	16.1%	17.7%
Organisational Information Requirements (OIR)	8.7%	10.2%	14.2%	28.7%	15.7%	24.4%
Asset Information Requirements (AIR)	13.4%	12.2%	13.0%	24.8%	15.4%	23.6%
Employers Information Requirements (EIR)	13.4%	10.6%	11.0%	25.6%	15.4%	25.2%
BIM Execution Plan (BEP)	14.2%	6.7%	11.8%	28.7%	16.1%	23.2%

# 4.13 BIM training



#### **KEY FINDINGS:**

- 57.9% (combined) of respondents agree or strongly agree "our employees would benefit from BIM certification or further BIM training courses". 28.3% were neutral and 13.8% (combined) disagree or strongly agree on this topic. This indicates a significant number feel they would benefit from further training.
- When respondents were asked to indicate the level of BIM training and support in their organisation only 10.2% rated it as very good, the more troubling statistics came from the minimal and none respondents with 23.2% recording minimal and a massive 32.7%, almost a third recording none.

PLEASE INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our organisation has a clear understanding about BIM training and a plan in place for staff training	9.4%	12.6%	31.5%	29.5%	16.9%
Our organisation has adequate resources/funding available for BIM training	7.1%	15.7%	38.2%	26.0%	13.0%
Our organisation already has in-house BIM expertise which is being used to conduct in-house training	10.6%	16.1%	30.7%	24.4%	18.1%
Our organisation has a plan in place to actively evaluate its BIM training	6.3%	13.4%	37.0%	27.6%	15.7%
Our employees would benefit from BIM certification or further BIM training courses	17.3%	40.6%	28.3%	6.3%	<b>7.5</b> %



66

Harnessing the potential of BIM in FM needs ongoing sector specific guidance and reallife examples to maximise knowledge transfer. What's equally important is having FM professionals leading the development of client EIR's as this provides the catalyst for understanding BIM and then improving its impact in operation."

Ivor McCauley, Facilities Manager, Glasgow Life

## 4.13 BIM training

Where respondents had received some form of BIM training they were asked to give general information about the type of training. The training was wide ranging including formal degrees from universities to specialist training delivered by a wide range of professional institutions and other organisations. Some of those mentioned included:

#### TRAINING DELIVERED BY:

- Webinars from BIFM and other professional organisations
- Internal company seminars and workshops addressing staff awareness of BIM
- Online courses
- Specific BIM training courses delivered by specialist organisations or professional associations (BIFM, BRE, BSi, BSRIA, RICS, etc.)
- BIM courses delivered as part of a further education programme (university etc.)

#### **TYPE OF TRAINING INCLUDED:**

- BIM familiarisation, essentials and awareness training
- BIM manager and project information manager courses (e.g. Mensch und Machine, Switzerland)
- BIM modules, research labs and electives (university)
- Training on specific standards associated with BIM (e.g. BSi courses)
- Accredited professional BIM training (e.g. BRE courses)
- CPD and distance learning
- BIM software training





"

Facilities management professionals as the long term custodians of an organisations buildings potentially can have a greater impact on the performance of the building than any other individual.

The engagement of the FM professional in the full design and build process helps to provide a building that can be maintained, and have in place the systems and processes to operate and maintain the building for optimal performance."

Paul Thomas, Principal Consultant, Turner & Townsend

# 5. Conclusion, recommendations and BIFM's Action Points

The majority of FM professionals had heard of BIM and many respondents anticipate BIM will have a significant impact on the FM industry although the exact time scales are not clear.



It is clear from this survey's feedback that the majority of FM professionals both in the UK and internationally are aware of BIM. Many people indicated they feel it has significant potential to both; impact on the FM industry, and deliver significant benefits. Interestingly a high percentage of people indicated they felt BIM might offer organisations a competitive advantage. However, the level of awareness and familiarisation varies widely across the FM industry with approximately half of the respondents indicating "FM is not yet really sure what BIM is". BIFM recognises this as an important requirement to do more to help support people who are starting on their BIM journey and want to get up to speed.

Some of the key benefits of BIM to FM highlighted by the research were; helping strategic decision making about asset maintenance and management, visualisation in terms of customer perception of their buildings and assets and visualisation for maintenance staff for planning maintenance and health and safety issues. The transfer of data from construction into CAFM and other software tools was also seen as a significant benefit. However, people also indicated there is a strong need for CAFM software suppliers to develop tools that allow bi-directional transfer of data between BIM and CAFM.

There were indications that some people felt BIM has been perhaps oversold and that significant work still needs to be done by the FM industry (in partnership with the AEC industries) to help ensure the potential benefits of BIM can be both; planned for, and realised in the operational phase of assets. Although the wider benefits are generally acknowledged they perhaps need to be made more transparent and better promoted to facilities management professionals, clients and investors in order that they understand why they should buy into, and equally as important, drive the BIM process by defining their needs at the start of the process.

Respondents also indicated they had concerns regarding access to, and the cost of training associated with BIM. This is another important point which has been picked up by the BIFM; the need for more BIM training specific to clients and facilities management professionals with a focus on understanding how to plan what information is needed and how they will access data in 3D models at handover. The research has provided valuable information to help BIFM benchmark current levels of awareness and understanding of BIM across the FM profession.



A soft landing means aligning asset construction and design with how we operate and maintain them. The FM professional on the project team from strategy stage and the use of BIM for the asset data are two areas in achieving buildings that truly deliver the outcome they are designed for."

Deborah Rowland, Director Public Sector Affairs, Sodexo





66

I believe that most facilities management professionals now understand the 'why' and the 'what' of BIM. We get the transformational nature and we broadly understand the principles that we need to apply. There has always been a strong desire from FM professionals to engage especially in the early days of the design and build process and the handover stage. So the most pressing question now is 'how' do we do so. The industry as a whole and especially customers need to think about how to procure FM services and engage FM professionals as part of an extended design and build contract. This to me is the final piece of the jigsaw that will really accelerate the involvement of owners and FM professionals in the development of BIM."

**Kath Fontana, Managing Director, ISS Technical Services** 

#### **About BIFM**

The British Institute of Facilities Management (BIFM) is the professional body for facilities management (FM). Founded in 1993, we promote excellence in facilities management for the benefit of practitioners, the economy and society. Supporting and representing over 17,000 members around the world, both individual FM professionals and organisations, and thousands more through qualifications and training.

We promote and embed professional standards in facilities management. Committed to advancing the facilities management profession we provide a suite of membership, qualifications, training and networking services designed to support facilities management practitioners in performing to the best of their ability.

BIFM Charringtons House 1st Floor South The Causeway Bishop's Stortford Hertfordshire CM23 2ER

T: +44 (0) 1279 712620 E: membership@bifm.org.uk



www.bifm.org.uk

\* While all due care is taken in writing and producing this Overview, BIFM does not accept any liability for the accuracy of the contents or any opinions expressed herein.

