

## Public sector demand for BIM

Government adoption is often seen as key to ensuring a wider uptake of BIM. Three near-neighbours in Europe – Denmark, UK and Netherlands – are making progress as IFC BIM becomes mandatory at various levels in their public sector projects.



Most advanced of the three countries is Denmark. Since 2007, central government

projects (or projects with a 50% state subsidy) have required the use of the country's 'digital standard', which includes IFC BIM. Implementation was slow at first – in 2007–08 the economy was strong and the government didn't want to overheat the market – but since then, the situation has changed dramatically and government agencies are now active in procuring new buildings. As the new system beds in, the use of project websites has been a particular success. 'The positive involvement by the professional organisations has also helped the industry to adopt BIM,' says buildingSMART Nordic chairman Jan Karlshøj.

State-level adoption was just the start of things. In June 2011, the Danish Parliament voted to extend the mandatory use of BIM to all local and regional projects worth over DKr20 million (€2.7 million) – buildings such as schools, libraries and sports facilities – with implementation of the various requirements beginning in 2012. Central government projects have a lower threshold of DKr5 million (€677,000). Different requirements will be set up for public sector housing, further stimulating the use of BIM. The

extended requirement for BIM is expected to have a big impact – the city of Copenhagen alone owns 2.2 million sqm of real estate – and around 400 projects a year are expected across the whole country.



And in the Netherlands, BIM is to become a mandatory

requirement in central government projects in the offices sector. As from 1 November 2011, procurement contracts worth more than €10 million will be covered.

'BIM will allow us to manage our real estate better,' says Dr Alex Vermeulen, director of Rgd, A&A. Once created, any BIM of an existing building will be kept live. 'The information must cover the whole life-cycle of the building,' he adds.

The retrospective modelling of the Sydney Opera

House served as a trigger and persuaded the Dutch government of the benefits of BIM in efficient FM. 'Many in the industry are very supportive,' says Alexander Pastoors of BNA, the Royal Society of Dutch Architects, but he admits that smaller firms will find it harder to take the plunge. Meanwhile, both suppliers and government procurement personnel are bracing themselves for culture change and the need – as Dr Vermeulen says – to 'reframe' their perspectives to meet the new requirements.



The UK government has embarked on a five-year programme to introduce BIM into all public sector projects by 2016. Its strategy is set in the context of rising asset management costs (where government aims to reduce whole-life costs by 20%) and

government targets to reduce carbon emissions by 80% by 2050.

Eighteen 'delivery groups' are being set up. Stakeholder groups have also been created to cover the interests of, among others, software vendors, institutions, supply chain, training and education, and media liaison. Mobilisation

has begun and the 18 delivery groups will help to develop the processes. Government will set objectives and allow the supply chain to determine how best to meet them. Government departments will be trained to articulate their needs better, while firms that are not yet BIM-proficient are preparing for change. 'This is the moment for BIM,' says Paul Morrell, the government's chief construction adviser, who is leading the change programme.

Visit [www.detdigitalebyggeri.dk/english](http://www.detdigitalebyggeri.dk/english) (Denmark); [www.rgdBIM.nl](http://www.rgdBIM.nl) (Netherlands); [www.cabinetoffice.gov.uk](http://www.cabinetoffice.gov.uk) (UK)



Paul Morrell Source: ICE



Dr Alex Vermeulen Source: Jan Willem Houweling, In The Picture

### BIM for design competitions



The value of BIM in assessing entries was shown in two recent design competitions. Judges for the new national museum, Vestbanen, in Oslo (below) found that open BIM allowed them to evaluate multiple entries in depth, while the client for the Ballerup university campus in Denmark (masterplan, above) praised the clarity that BIM offered: 'It gives a much more informed basis for assessment'.



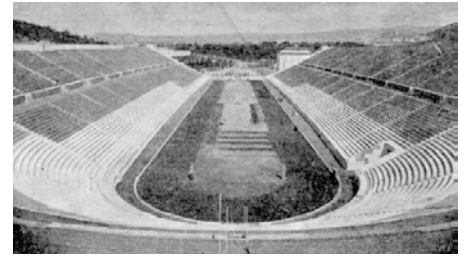
(Left) Historic state assets such as Kronberg Castle are also included in the Danish government programme for digital construction and FM Source: Fiskfisk – public domain

## London 2012 – Olympic dreams and realities

The Olympic Stadium was completed in London in March 2011, on time and under budget – and with a little help from BIM.



## Olympic stadia of times past...



*Athens 1896:* The first modern Olympics were held at the Panathinaiko stadium, which took the elongated form of the ancient games and even recycled marble from the ancient stadium



*Amsterdam 1928:* The stadium was built in the Amsterdam style – a local variant of European styles – with long horizontal lines



*Berlin 1936:* The 1936 stadium reflected the authoritarian architecture of the Third Reich; since renovated, it hosted the World Cup final of 2006



*Munich 1972:* The 1972 stadium showed Germany in a happier light and pioneered lightweight tensile and membrane construction



*Beijing 2008:* The Bird's Nest Stadium used an IFC-based tool, known as 4D-GCPSU 2006, to manage the construction schedule, resources and site layout

Sources: London Olympic Stadium – London 2012; BIM – ODA Press; Athens – Pierre de Coubertin, *The First Olympiad*, London 1897; Amsterdam – public domain; Berlin – Hoffman, Deutsches Bundesarchiv Bild 183-R82532; Munich – Arad Mojtahedi (public domain); Beijing – Chen Zao (CCA2 Generic)



The 80,000-seat stadium covers an area of 40 acres, lying towards the south of the Olympic Park. It is not as striking as the Bird's Nest Stadium in Beijing but it is a building that matches British reserve and is suited to a recession. Sustainability has been a key concern and with around 10,000 tonnes of steel, it will be the lightest Olympic Stadium constructed to date.

The project was designed and constructed by Team Stadium, a consortium led by Sir Robert McAlpine, together with architects Populous and structural and services consultants Buro Happold. The project would have followed a traditional path without the inspiration of Sir Robert McAlpine, who were intent on having a fully integrated team approach, and believed that a central point of

information, like a building information model, would add value.

It was at this point that buildingSMART member Fulcro was brought in. Fulcro provides solutions to ease information transfer and get projects built smoothly on-site – bridging the gap between design and construction. 'We created a 3D model to validate the service information,' explains Ben Haldin, business development director at Fulcro. 'It comes down to a team understanding of what you're trying to achieve.'

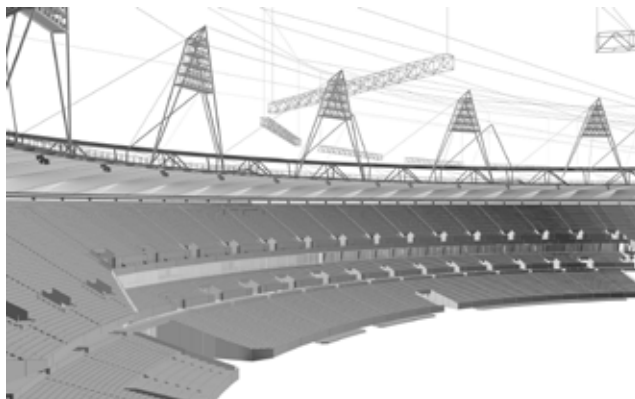
The next step for Fulcro was to get involved with the design management function and enable the team to utilise the 3D Model for team review and meetings. The aim here was to de-risk parts of the project before the MEP (mechanical, electrical and plumbing) contracts were let.

All the architects and engineers for the project were co-located at the site. Co-location, combined with the BIM, offered a belt-and-braces approach. Designers had the benefits of having project colleagues right there, as well as working via the BIM. Weekly workshops, comprising design reviews, clash prevention and clash detection, were run by Fulcro and were treated as working opportunities to carry the design forward.

Some of the team members were doubtful or wary about the value of BIM at first but saw the benefits as the model developed. The model provided visualisations that helped them to see their work in 3D for the first time. There were challenges in the routing of the internal sanitation systems, as the drainage pipes had to be threaded through pre-cut holes in the beams – and design changes were ongoing. Using the model to verify these features ensured the design was fully validated.

The BIM brought clarity at the construction phase, reduced risk and won the support of team members. 'We did something simple that really added value,' says Ben. 'But then, any project would benefit from a little bit of BIM.'

*Another version of this article, with additional information, appears in BuildingSMART UK News 27.*



(Top left) London Olympic Stadium; (above) the BIM used in construction

## Singapore supports BIM

A buildingSMART Industry Day – the ‘BIM-finitive Way to SMART Construction’ – was held on 21 September as part of the Singapore week of events and meetings. The aim was to share understanding of BIM, and the day brought together local delegates, representing architects, engineers, contractors and government, along with international participants – some 280 in all.

Back in 2008, a survey revealed that fewer than 10% of firms in Singapore were using BIM; today the figure is probably around 25–30%. The local chapter is targeting a figure of 80% uptake by 2015, and the government is introducing a series of strategies to stimulate BIM use. The public sector is taking the lead, helping build BIM capability through training and certification and incentivising adopters with subsidies from a government BIM fund. Work is being done on pilots and to help the industry become BIM-ready. Larger projects will be required to use BIM for their architectural designs by 2013 and for engineering designs by 2014; smaller projects, both public and private, will be covered by 2015. The Singapore Building and Construction Authority runs workshops and roadshows to raise awareness.

International speakers set out progress in BIM use in their home territories, while case studies covered examples from the local region, such as the Singapore Sports Hub and a new block at Singapore’s School of Medicine. Construction company and project owner Woh Hup described a residential complex at Keppel Bay, Australia, where the use of BIM ensured that the design intent of the roof crown of the six towers could be realised in practice.

‘The conference served to educate the audience on the challenges and benefits of using BIM,’ concluded Cheng Tai Fatt, auditor, buildingSMART Singapore. ‘The aim was to reinforce the point that BIM is the definitive way to “smart” construction.’



(Above) Keppel Bay complex; (below) Singapore School of Medicine See Singapore Industry Day – [www.buildingsmartsingapore.org/events.htm](http://www.buildingsmartsingapore.org/events.htm)

## Seeking sustainability – Norway conference

The Norway chapter held its autumn event on 10 November with an audience of 126 satisfied participants. The event explored the theme of how to meet demanding

political requirements for a sustainable built environment with open BIM. The political goals were explained by Norwegian MP Nikolai Astrup. The South-Eastern Norway Regional Health Authority then presented its own strategy for sustainable building and operation with open BIM.

Can we be sure that the use of open BIM is really cost effective for clients and suppliers? A study from Denmark – looking at real-world experiences with detailed costings – has shown that open BIM is profitable,



Demo house for energy efficiency Source: Norwegian Homebuilders Association (Boligprodusentenes Forening)

a finding of great interest to the delegates. This presentation will be rerun at an industry day next March to coincide with the buildingSMART’S IUG/ITM meetings in Oslo.

One strength of BIM is that it allows the parties to conduct analysis and optimise energy efficiency, and the conference heard about a prospective energy calculation solution for houses from the Norwegian Homebuilders Association. The event indicated that, properly managed, sustainability is profitable in the long term and that ‘building smart’ is the most promising initiative to create a sustainable built environment – but we must keep a strong focus on the strategic and political goals in our use of open BIM.

## Training survey for bSI – can you help?

Key to the future success of open BIM is the ability of the supply chain to put it into daily use. This will require education and training – something already recognised by some member countries with their provision of training and workshops.

But what kind of training works best? And could good practices in one country be exported to another? The 2020 Roadmap – bSI’s strategy for the next decade – sets a high value on training and education and proposes an Education and Training Group. More immediately, it is crucial to find out what training and education already exists in the buildingSMART world – by asking chapters about local provision.

A questionnaire will be sent to all chapters, asking about local training in open BIM: what form does it take, who are the providers and what is the target market? The potential for future education and training will also be explored through the survey. A sample of respondents will be asked to take part in telephone interviews so that the study can gain greater insight.

The questionnaire has been drafted and will be sent out shortly. Findings will be presented to the International Council in London in May. Long term, buildingSMART branded training material and accreditation are a clear possibility, but the first step is to understand the present state of play.

*If you can respond on behalf of your chapter or are available to be interviewed, please contact [michael.cannell@mypostoffice.co.uk](mailto:michael.cannell@mypostoffice.co.uk) (consultant) or [cg@buildingsmart.org](mailto:cg@buildingsmart.org) (Chris Groome, business manager)*

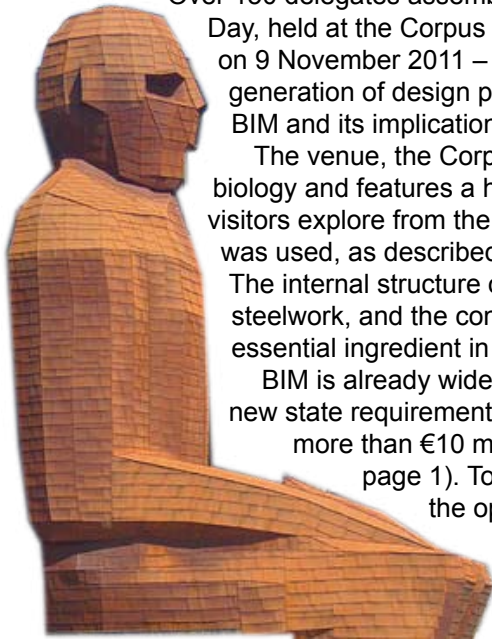
## New appointments in Germany

Siggi Wernik has been appointed chairman of the German-speaking chapter, following the retirement of Rudolf Juli. Konrad Stuhlmacher takes on the role of business manager. *Contact details: [siggi.wernik@buildingsmart.de](mailto:siggi.wernik@buildingsmart.de) and [konrad.stuhlmacher@buildingsmart.de](mailto:konrad.stuhlmacher@buildingsmart.de)*

## IFC4 – last chance for comments

The buildingSMART standard IFC2x4, also known as IFC4, went out for its final review in October 2011, with the deadline for comments of 31 March 2012. This marks the last stage of its journey to become a full ISO standard. This is the version that will be submitted to ISO for acceptance as the Draft International Standard, ISO DIS 16739. ‘We urge stakeholders – especially software people – to take this last chance to review and influence the final version,’ says Thomas Liebich, who leads buildingSMART’s Model Support Group. See: [www.buildingsmart-tech.org](http://www.buildingsmart-tech.org)

## Benelux Industry Day



Corpus Museum venue for the event Source: Pvt pauline, under GNUFD license

Over 150 delegates assembled for the first-ever Benelux Industry Day, held at the Corpus Museum near Leiden, Netherlands on 9 November 2011 – many of them representing a younger generation of design practitioners eager to know more about BIM and its implications.

The venue, the Corpus Museum, is dedicated to human biology and features a huge figure of the human body that visitors explore from the inside. To construct the figure, a BIM was used, as described in the session on 'BIM in practice'. The internal structure of the figure relied on complex steelwork, and the contractor saw the use of BIM as an essential ingredient in its successful completion.

BIM is already widely used in the Netherlands but the new state requirement for BIM in certain projects worth more than €10 million takes it to a new level (see page 1). To tackle the problems – and exploit the opportunities – of projects that require collaborative working, 'open BIM' offers a practical option. This was emphasised by Leif Granholm of buildingSMART Middle East in the keynote address, while Paul Bos of

Zeep Architecten clarified the difference between open and closed BIM and spelled out the benefits of open BIM.

Other parts of the event provided an honest critique of IFC – what it can do and where improvements would be welcome. Various software tools – available or in development – were explained. The day offered a forum for knowledge-sharing and networking, never losing sight of the value of BIM for the client. Nonetheless, the serious intent permitted lighter moments, as in the music video screened during the breaks, where an ultra-cool rock band celebrates the buildingSMART format: 'IFC – it's open and it's free'.

Visit: [www.buildingsmart.nl](http://www.buildingsmart.nl)

## Collaboration with ISO

Officers of buildingSMART from around the world, including Francois Grobler, Rasso Steinmann, Øivind Rooth, Jøns Sjøgren, Alain Maury, Thomas Liebich and Chris Groome, attended the meetings of ISO in Singapore during 19–22 September to strengthen collaboration between the two organisations – an initiative which was set up in February 2011.

Over the past seven months, liaison A status has been developed between buildingSMART International and two ISO groups, ISO Technical Committee 59 (Building and Civil Engineering Works) and its Sub-Committee 13 (Organisation of Information in Construction Works). This led to an agreement that buildingSMART'S International User and International Technical Management groups should meet in parallel with ISO, starting in Singapore. Working groups of buildingSMART and Sub-Committee 13 have also been combined.

One problem for buildingSMART has been the length of time it takes for our standards to be accepted as a full ISO standard. The first steps have been made to shorten the standards development process, and in future those interested in a topic in bSI and ISO will collaborate in a single group, at once strengthening the group and ensuring one outcome straight off. By working within TC59 SC13, buildingSMART will eliminate the old stage of drafting standards outside ISO and then passing them over to ISO for review and redrafting.

At chapter level, buildingSMART is making new efforts to seek similar collaboration with national standards bodies who are also members of ISO. Norway is leading the way in building in-country collaboration.

Arranging buildingSMART meetings to coincide with ISO events is an effective way of bringing the two organisations together. Plans are underway for SC13 to meet in Oslo at the same time as the buildingSMART meetings week in March 2012, and for buildingSMART to convene in Tokyo in October 2012 when TC59 is holding its biennial plenary there.

### Modelling conference – call for papers

The European Conference on Product and Process Modelling (ECPM) holds its ninth biannual conference on 25–27 July 2012 in Reykjavik, an event supported by bSI. It has issued a call for papers, with a deadline for submission of abstracts of 12 December 2011.

Visit <http://2012.ecppm.org>

### OpenINFRA – update

The prospective IFC for infrastructure project – openINFRA – was discussed at the Singapore meetings in September 2011. The draft proposal – now being amended by Christophe Castaing, Egis International, from the French chapter, which is leading the project – will demonstrate that this is a practical project which meets real needs and will offer tangible rewards for the efforts that will be put into it. The openINFRA steering committee is setting up workshops in order to explore work already done around the world and identify how consistent process maps are.

The revised proposal, drawing on work by the steering committee, will be discussed at the IUG and ITM meetings in March and be presented to the International Council in May 2012.

'We have to get the details of the proposal robust and workable,' says Christophe. 'At the same time, we are asking other chapters to determine the local level of support for the project.'

### And finally... IFC database live

The database of IFC-compatible software applications went live in September and has already grown to 146 apps. It can be accessed at: <http://buildingsmart-tech.org/implementation/implementations>

### BuildingSMART International

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