

Major players assemble in Oslo Treasure trove of BIM experience

How can we transform the industry to meet the needs of the market? How do we spread the 'building smart' message to enable the players to make efficiency gains? In short, how are we helping the building industry to move forward?

This was the theme of buildingSMART Norway's international conference, held in Oslo on 22 March 2012. The conference highlighted the vision behind open BIM, the business case and the realities of implementation.

Political will and global vision

The first key ingredient in successful open BIM is political will; the second is vision. Norway has already shown its commitment with its property services agency, Statsbygg, requiring the use of BIM. Erna Solberg, leader of the Norwegian Conservative Party, set out the social background, with Norway's rising population and growing housing needs. Patrick MacLeamy, bSI chairman, then explained how buildingSMART had been formed to counter the problems of a fragmented industry, with no common standards for information exchange. After a period spent mainly on defining standards and promoting uptake, activities at buildingSMART are now grouped into two principal areas, the Process Room and the Product Room (see page 2).

Case studies

Norway is a world-leading country in BIM implementation, and the Norwegian case studies that followed offered insights into how it's done in this far-sighted country. In 2004–08, Akershus Hospital used a BIM for a large number of functions for its entrance building, just one part of a new-build hospital complex; today a complete hospital is being built using a multi-functional BIM. Elsewhere, NCC Construction, a leading Norwegian company, is using 'virtual design and construction' for its new head office in Oslo. The Norwegian Defence Estates Agency has adopted the buildingSMART concept and the use of BIM, and is now embarking on its first zero-energy building.

Moving beyond Norway, Skanska is using a BIM for a range of functions for its new HQ in Finland. Skanska is a major supporter of BIM – and with 10,000 projects going on around the world at any one time, its commitment carries clout – and is rolling out BIM use in all its projects at increasing levels. In the UK, BIM was used on the 2012 Olympic Stadium to de-risk the construction process.

A powerful business case

Two speakers put the spotlight on savings. Thomas Gay, from US insurance company FM Global, argued that open BIM allows field engineers to do virtual site inspections and assist loss prevention, with massive savings in the offing. And Peter Hauch from Denmark explained quantitative research into the savings that open BIM can provide in four carefully chosen projects.

At the end of the event, which provided persuasive evidence of savings and sustainability through BIM, Steen Sunesen, MD of buildingSMART Norway, said: 'The conference has seen some very real benefits – open BIM is not an obstacle but a means to success'.



Case study 1

'FutureBuilt' office in Oslo



Øststasjonsveien 27 – Ø27 for short – is a six-storey office building with strong environmental credentials from property developer and construction company NCC. The company uses 'virtual design and construction' (VDC) for numerous functions, including acoustic simulation – which, in this project, revealed that the noise from the open-plan ground-floor canteen might prove a nuisance. The answer was to insert a mezzanine area of office space immediately above the canteen to dampen the sound. Oslo city council has recognised Ø27 as a low-impact 'FutureBuilt' project.

Case study 2

Sustainable building at Østfold Hospital



The new Østfold Hospital, due to be fully operational in 2016, lies in Sarpsborg, around 100km south-east of Oslo. The client is the South-Eastern Norway Regional Health Authority, which has put in place an open BIM strategy. During design, the BIM is being used, among other things, to simulate life-cycle costs, energy consumption and carbon footprint; it will also form an essential part of operation and FM. 'Our BIM vision is to reduce cost and time... and get better functional areas with less faults,' says Birger Stamsø, head of project strategics.

Product & Process Rooms taking shape



Jan Karlshøj

The Product and Process Rooms, formed in early 2012, kicked off activities with workshops held in Oslo on 21–22 March in the run-up to the buildingSMART Norway conference. The Rooms group buildingSMART work into two distinct centres: product and process.

Both Rooms support professionals in the construction industry who are using digital information, prototypes and models, and help organisations profit from the integrated workflows that BIM requires. The

Product Room is concentrating on the buildingSMART Data Dictionary (bSDD, also known as IFD). Roger Grant, buildingSMART Alliance, US, who leads the Product Room, explains: 'We are supporting the development of open BIM, shared content naming and structuring, and of course the Data Dictionary.'

Jan Karlshøj, buildingSMART Nordic chairman and project leader of the Process Room, sums up its remit. 'We want to help the industry to profit from open BIM, as well as explore and share best practice on information delivery manuals and BIM manuals.' A key aim is to stimulate international collaboration between organisations in development projects and pool the information.

Tackling a packed agenda, the Process Room covered, among numerous topics, the use of BIM, some of the tools that underpin the buildingSMART approach and the BIM implementation guidelines that are emerging in many countries. Running in parallel and equally busy, the Product Room workshop heard about bSDD – the business case and enabling tools – together with product library work from around the world.

The Rooms comprise both virtual space and physical events. International workshops will take place twice a year, with virtual collaboration ongoing. 'The creation of the Rooms is revitalising existing activities and offering an open forum for new ideas,' adds Chris Groome, bSI business manager. 'All are welcome, both within and outside the buildingSMART community.'



Roger Grant Photo: Eigil Nybo

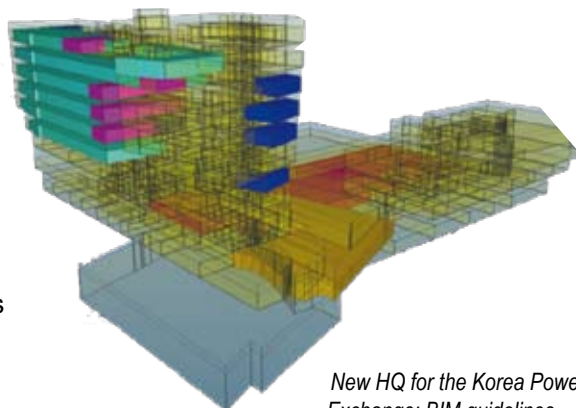
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Busy agenda in Korea

The Korean chapter is active in stimulating BIM uptake, offering guidance and showcasing achievement through annual conferences, technical seminars and BIM awards. The chapter has helped develop national BIM guidelines for public sector use and specific guidance for individual projects and companies. For the new HQ of the Korea Power Exchange, it developed design competition guidelines. It has also provided consultancy for the Lotte Super Tower project, a 123-storey tower block in Seoul – now under construction – establishing step-by-step BIM procedures.

Since 2009 the chapter has run a BIM project registration service to gather better data and encourage adoption. The annual BIM awards are made in four categories (vision, design, construction and green building),

with two separate student categories. Its BIM professional training course nurtures BIM practitioners, and the chapter was co-organiser, along with buildingSMART Singapore, of Build Asia Live 2011, a virtual design competition. All in all, a period of high activity for the chapter. 'The level of BIM implementation is going up and we are contributing to the transformation,' says Inhan Kim, chief vice-chair of buildingSMART Korea.



New HQ for the Korea Power Exchange: BIM guidelines were established and open BIM used from the start
Source: Solibri Magazine

Project proposal on openINFRA

The openINFRA Steering Committee, led by Christophe Castaing of Egis, is presenting its project proposal to the International Council in May. The committee was set up in July and over a nine-month period a project proposal has been developed, with input from a task team, together with ITM and IUG (technical and user groups). Similar work elsewhere has been reviewed. The first deliverable of the new IFC Infra is envisaged as a merging of the ifc-bridge and ifc-tunnel models.

OpenINFRA is an ambitious vision but in the past year, BIM for infrastructure has started to sound like a real possibility. 'We need to move forward incrementally,' says Christophe. 'Each increment should tackle a priority information flow where interoperability would offer significant benefits and software providers would be attracted to implement the necessary software.'

Protecting our work

When the IFC data model IFC4 (IFC2x4) is accredited as a full ISO standard, the work done by buildingSMART International will remain protected. This is the result of a copyright licence agreement between bSI and ISO, signed in December 2011. Under the agreement, bSI retains copyright in IFC4 but allows ISO to publish and distribute it. ISO members in individual countries are also allowed to use the standard in their own national adoptions.

'The agreement facilitates a process of our producing standards through ISO but keeping our own intellectual property,' says Chris Groome who, as company secretary, signed the agreement on behalf of bSI.

Licensing our Open BIM logo

From its early days, buildingSMART has set interoperability as its highest priority. This priority has gained new momentum with the Open BIM movement and bSI has created a brand licensing agreement to allow the use of its openBIM trademark and the Open BIM logo.

The licensing agreement is aimed at software vendors and organisations in the AEC industry, including individual projects within the industry. The licence document spells out what the licensee needs to do: requirements include a dedicated section on Open BIM in their corporate website, use of the official definition and more. Licences are granted free of charge, so it is especially important to clarify what is expected in return for adopting what is likely to become a useful and recognised logo.

Profile

Siggi Wernik – architect, BIM enthusiast and chapter chairman

In September 2011, Siggi Wernik became chairman of the buildingSMART German-Speaking chapter (bS.de). He leads the chapter on a European stage of growing BIM uptake – where the German design and construction industry remains a cautious player. The prospect of persuading users and clients of the benefits of BIM has tempted Siggi to make time to act as chairman of the chapter, despite the heavy demands on his time.

From his childhood, he had a strong passion for buildings, unsurprisingly since his father ran a joinery business, and craftsmanship was in his blood. He decided to become an architect and studied at RWTH Aachen University in the 1970s. He started out with Stirling Wilford & Associates – the firm founded by leading British architect James Stirling – and worked in Stuttgart, Berlin and London, rising to become head of the German practice. He was involved in such high-profile projects as the new Staatsgalerie in Stuttgart, the State University of Music and Performing Arts, also in Stuttgart, and the Braun HQ in Melsungen.

In 1994, he began working with fellow architects Hilde Léon and Konrad Wohlhage, and in 1997 the three founded the practice of Léon Wohlhage Wernik Architekten. Asked about his proudest achievement as an architect, he is reluctant to single out an individual project: 'Maybe the fact that I am still keen to explore new shores' is as much as he will say.



Getting to grips with CAD and BIM

He started to use CAD applications in 1991 and his initial involvement with BIM was through Graphisoft's ArchiCad – 'only the term BIM was not yet in our heads'. As things progressed and users became more demanding about getting data out of the model, BIM as we know it today emerged. 'I think I started using the term some ten years ago,' he says.

End-users of software in Germany use international products and Siggi has long used Graphisoft. He is enthusiastic about the launch of the Open BIM movement and congratulates Graphisoft and Tekla: 'It's a great initiative and they have done a very good job'. In addition to the giant Nemetschek, there are a few specialist German software companies, covering areas such as procurement, quantities and costs as well as structural calculations and FM.

Leading the German-speaking chapter

As chairman of bS.de, Siggi has his work cut out. By his own admission, 'the German building industry with regard to BIM is obstructed by tradition, regulation and mandatory German standards'. While Germans may be justly proud of their standards, they may also be an obstacle to technology change like BIM and the necessary cultural changes. The federal structure of Germany compounds the problem. Citing one example, Siggi explains how the federal states all 'have their own individual regulation on how to deliver building design documentation'.



Projects from Siggi's career. From his time with Stirling Wilford: (top) Neue Staatsgalerie, Stuttgart; From Léon Wohlhage Wernik: (middle) Caleido offices in Stuttgart – visualisation; (above) Bavarian state parliament with extension cube lower centre – photo montage; (below) Health Campus North Rhine-Westphalia, Bochum – visualisation
Sources: Neue Staatsgalerie, Muskiproz, 2004 (GNUFDL); all others Léon Wohlhage Wernik

As a start, bS.de has moved its administration from Munich to Berlin to be closer to decision-makers in the capital. Uptake of BIM is patchy, probably strongest among contractors. But Siggi believes that his experience on the user side may help him persuade other designers of the benefits of BIM. He also argues that nothing convinces more than real-world examples. 'My aim is to get a few real-life pilot projects running in order to demonstrate the potential of BIM... We are working on the German BIM success story.'



Does it pay? Results from Danish BIM research

Building owners and design practices are sometimes wary of taking the BIM route. How much will it cost? Will the investment pay off?

A Danish project, begun in 2009 and nearly complete, has measured the profits achieved by using BIM and documented a range of benefits. 'In the construction industry, we have no tradition of measuring the profit and cost of the investment in new tools,' explains Peter Hauch of Arkidata, who participated in research led by Flemming Vestergaard, assistant professor at the Technical University of Denmark. 'In this research, we wanted to measure cost and profit in real life, provide exact measurement and enable others to benchmark,' adds Peter.

A steering committee made up of representative stakeholders was set up. A methodology was then created and is embodied in the ØG-DDB manual – a detailed specification of how to do the measurements, allowing

others to follow suit. Four types of benefit were distinguished: direct and indirect, spin-off and potential.

To pioneer the methodology, four case studies were selected to cover different project sizes and interest groups. The first was a Dkr 1.8 million project to refurbish a family home, involving a small firm of architects, Tværsnit. Here the use of BIM led to savings of 10% for the owner. Two smaller consultants also saved money, with the benefits more than balancing out the costs.

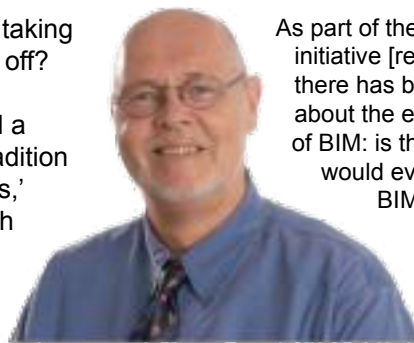
At the other end of the scale, the second case study featured a new HQ – worth Dkr 100 million – for engineering consultants Rambøll. Direct benefits of BIM included a saving of Dkr 3.8 million when the project team completed early. In a spin-off benefit, the improved communications and co-ordination allowed

the ventilation contractor to reduce their costs by Dkr 3.5 million. The model was also used when the cleaning contract went out to tender; two of the bidders used the model and a 30% saving was realised.

In the third case study, the client employed a BIM consultant to create a BIM, which enabled the FM arm of the client group to bid for the FM contract with a reduction of 15%. Finally, construction company MT Højgaard moved from 2D drawing to 3D modelling in the space of a single project in the billion kroner project to build KPMG's new HQ in Copenhagen, the cost being considered as an investment, not a project cost.

'The more you invest in BIM competence and collaboration, the more you get back,' concludes Peter. 'Size is not relevant: a small company can easily do total implementation – and so, too, can a small department.'

The manual and results will be available at www.byg.dtu.dk/Publikationer/Byg_rapporter.aspx at the bottom of the list (Danish only). Slides in English can be obtained from Peter Hauch (hauch@arkidata.dk) or Flemming Vestergaard (fv@byg.dtu.dk)



Q&A with Peter Hauch

What prompted you to do this research?

As part of the Danish Digital Construction initiative [requiring high-level ICT], there has been a lot of discussion about the economic implications of BIM: is there a benefit and who would eventually profit from using BIM in projects? Much of the discussion was hot air and loose assumptions, so we thought it would be beneficial for the industry if we took the discussion to a higher level.

What surprised you most about your findings?

That often the cost is so little and the benefit so big that it can pay off to do some serious implementation within a single project, and that even partial implementation pays within a company or within projects. You don't have to be a big company or do the 'full monty'.

How has the research been received in Denmark?

There is a lot of interest, but the reports are not yet published, and we have only done a few small presentations of the preliminary results, so we have yet to see what the reaction will be. But rumours are going around that 'it can't be true'.

Are there plans for follow-up research and dissemination?

We have a communication plan, including presentations and seminars and discussions with organisations in the industry, in order to try to make them take up the issue among their members. Also the Danish Building and Property Agency is using it as a basis for discussions on public initiatives among local and regional authorities. ■



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Build London Live 2012

... and London briefing and meetings

The latest Build London Live (BLL) takes place during 21–23 May. BLL is a 48-hour virtual design collaboration, with design teams competing from around the world to provide outline designs for a multi-use development on a high-profile site in London – still to be revealed. BLL, organised by Asite and AEC3, shows what can be achieved using interoperable formats, and awards will be made on the final day. The International Council will meet on 22 May and 23 May (am). On 23 May (pm) there will be an executive briefing before the BLL awards.

Visit www.buildlondonlive.com (BLL) or contact beryl.garcka@b-r-t.co.uk (executive briefing)