

Open standards for infrastructure

The wider potential of buildingSMART has swiftly shot up with early proposals for extending the IFC standard to infrastructure. A meeting of buildingSMART members was held in Paris on 8 July to share experiences of modelling for infrastructure and identify next steps.

Leading the meeting were members of the French chapter whose involvement in the infrastructure project, Communic, has made them eager to stimulate international efforts.

'Some of the big players in the French industry – VINCI, Bouygues and my own company, Egis – are accustomed to working together collaboratively,' explains Christophe Castaing. 'This created the opportunity for us to develop a project and get funding for it. Our own contributions were matched by government funding.'

Communic was a €2 million multi-partner project that ran between 2007 and 2010. The wide-ranging initiative had the overall aim of identifying ways in which infrastructure projects could be managed more efficiently over their whole life-cycle. Communic took real-world projects, including part of the new A19 toll motorway in France, and found that traditional data structures did not respond to actual needs. But it was possible, as Jean-Baptiste Valette of VINCI showed during the meeting, to 'hijack' IFC objects – and that might offer a way forward.

Communic recommended that an open data exchange standard and collaborative platform should be developed. 'Civil engineering needs definitions of a data model and specific entities,' says Pierre Benning of Bouygues, who was also involved in the project.

Other countries are also starting to build knowledge of standards and modelling for infrastructure. In Korea, IFC is being used in nuclear and power plants. Japan has done work on product models for bridges and shield tunnels. Germany's ForBAU project created 3D parametric road and bridge models, while in Norway the Public Roads Administration is committed to use open format models by 2015 (the format to be decided). In the US, the National Institute of Standards and Technology believes that infrastructure delivery must be improved. And an international project of 2004–06, IFC Bridge, following an earlier French project which had used the IFC and OA-EXPRESS formats, explored a data model for bridges, delivering proof of concept and an IFC view.

The Paris meeting brought together members with an interest in developing IFC for infrastructure. There was agreement that a big open-ended project would deter potential funders and that chapters should identify four or five use cases – areas of work – of particular interest to them. 'The bridge part is the most feasible,' says Thomas Liebich, who leads buildingSMART's Model Support Group. 'So much work has already been done.'

A steering group was set up, with representatives of buildingSMART chapters and France's Club Communic, the network set up in the wake of the project. Defining the prospective scope will be among the first steps to be taken. Members were asked what the IFC Infra project should be called – and the name openINFRA was agreed.



In future, bridges such as those in South Korea (above) and Salford, UK (below left) may benefit from IFC for infrastructure
Source: Jindo bridge, South Korea: Buckaroo Jeans, 19 October, 2008, under cc-by-sa-2.0

Q&A with Pierre Benning

Pierre Benning, Bouygues, was involved in the Communic project to explore open-format modelling for infrastructure and is participating in openINFRA.

What is the vision behind openINFRA?

We have a vision of interoperability and efficient data management. Today we have expert tools to help us in the various processes, but tomorrow we will need to integrate all the processes into a central database.

Who stands to benefit most?

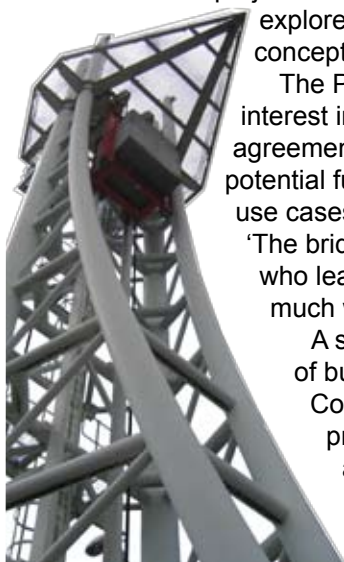
It takes five years to build a highway that will be in use for 50 years. So most of the benefits will be felt during operation and maintenance. Nonetheless, all the disciplines will benefit, from client brief onwards.

Will there be any quick wins?

Yes. During construction openINFRA will help us avoid errors on site. And, of course, a complete model, with all its attributes, will help at the design stage.

What would you say to someone thinking of getting involved in openINFRA?

Come on in! This is an ambitious project. We need the goodwill of everyone – and efficiency improvements are to the benefit of all.



New chapter for Canada

A new chapter of buildingSMART has been launched in Canada. Until now, practitioners in Canada were involved in the work of the North American chapter, the buildingSMART Alliance, but the Institute for BIM in Canada was eager to create its own Chapter and took the lead in setting it up.

There are practical and cultural differences between Canada and the US. Canada is a dual-language country, with a legal system that is closer to that of the UK, Australia and Singapore than to the US system. And unlike the US, it uses the metric system. These differences – combined with a strong interest in facilitating the adoption of BIM in Canada – are behind the creation of an independent chapter. Co-operation with other chapters is anticipated, and a close link will be maintained with the buildingSMART Alliance on North American matters.

Dave Pelletier of D&G Mechanical is chairman of the new chapter. Other roles are being taken by Pierre Boucher, Canadian Construction Association, as business manager, and John Hale, Department of National Defence, as technical co-ordinator.



Dave Pelletier, president of D & G Mechanical and chairman of the new Canada chapter. He was formerly president of the British Columbia Construction Association and has served as chair of the Canadian Construction Association's standard practices committee

Japan earthquake – GIS and BIM technologies help in tsunami damage repair

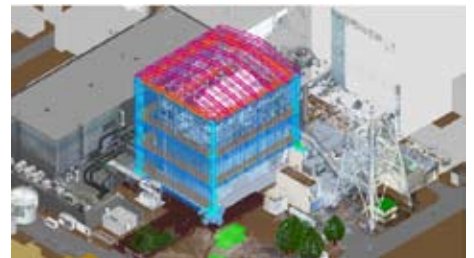


In March 2011, the powerful earthquake that hit north-east Japan triggered a massive tsunami, leading to huge loss of life. The tsunami reached 10km inland and caused great damage to the built environment: 77,000 buildings were completely destroyed, 31,000 were destroyed in part, and a further 246,000 sustained partial damage.

'We were astonished at the power of the earthquake and aftershocks,' says Junichi Yamashita, chair of the Japan chapter, who was in Tokyo at the time. 'I have never experienced such earthquakes before.'

The country's response was immediate. An emergency mapping team was formed the day after the earthquake. The team collected information which it published on GIS (<http://www.drs.dpri.kyoto-u.ac.jp/emt/en/>) for damage analysis. Satellite and aerial images were used to analyse the tsunami-damaged area and were made available to companies to use for repairs to their premises. 3D laser scanning was deployed to swiftly reveal the debris scattered by the tsunami.

The tragic event in Japan has indicated how GIS and BIM are key components in managing relief and repair in an area damaged by tremors or a tsunami. 'The Japanese have shown great spirit in fighting and overcoming the disaster,' adds Junichi.



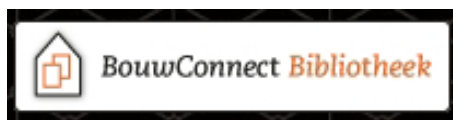
(Above left) Sendai, close to the epicentre of the earthquake, viewed from US naval helicopter delivering food supplies

BIM was used in detecting earthquake damage: (above) Fukushima Daiichi nuclear station (3D laser scanned image); (below) The integrated model of 3D laser-scanned point cloud and 3D model of steel structure covering

Sources: Sendai image – U.S. Navy Photo. Use of released U.S. Navy imagery does not constitute product or organizational endorsement of any kind by the U.S. Navy Nuclear station: Tokyo Electric Company

Dutch collaboration

Three companies in the Dutch IT sector are teaming up to develop an object library for the construction market with an investment of €50 million. Telecoms company KPN and its subsidiary Getronics, together with architectural practice Twee Snoeken, are investing this sum in a joint initiative called BouwConnect. The five-year project, which started in October 2010, will develop a



huge object library for the Dutch construction industry, offering a firm basis for wider use of BIM processes. This is a large-scale project, and it will employ around 140 people.

The first release of BouwConnect is expected in late summer 2011.

BouwConnect will be made available first of all in the Netherlands. After local implementation, an

international launch is likely.

'The BouwConnect library will offer unique product and building component definitions to all parties in the construction chain,' observes Benelux chairman Gerrie Mühren. 'This is a significant and welcome development.'

Visit www.bouwconnect.nl The website is in Dutch but there is a translation facility and good visuals

Airport projects in Norway and Australia

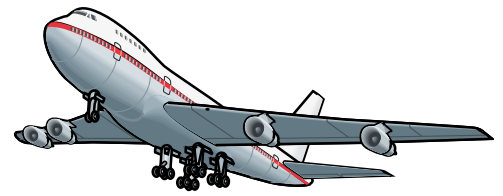
With passenger numbers predicted to rise to 35 million a year by the 2030s – almost double the figure for 1998 – Gardermoen Airport in Oslo is at the start of a major expansion. The first step is to build a new terminal, and plans for Terminal 2 were approved in December 2010. From the start, the project has been defined as a BIM project, and all parts of the project have to be delivered through a BIM or be a part of the BIM process.

All the architects and engineers are required to deliver their models in both a native CAD format and in IFC format throughout the process. During 2011, several contractors will start their involvement, and all the contractors will also be required to participate in the BIM process. Terminal 2 is expected to open in 2017, with further

phased expansion until 2038.

Also taking the long view of airport requirements, a research project called Airports of the Future is being conducted at the Queensland University of Technology. One part of this wide-ranging project is exploring an Airport Information Model or AIM – an extension of BIM dedicated to airport needs. Once developed, the AIM would integrate all the airport information systems – such as design and planning, operations and asset management – into a common platform.

This research is developing 3D models of airport structures, using database and information technology to manage the diverse information. The research team, with Professor Robin Drogemuller as chief investigator of AIM, is putting an emphasis on compatibility with existing simulation and information systems in Australian airports. There is consultation with Gardermoen airport, Oslo: visualisation of planned expansion



industry stakeholders to identify the information requirements of airport stakeholders. To deal with modern-day terror threats, the model would include tools to cover emergency response and damage assessment. Existing blast modelling software developed at the University of Melbourne will be customised and a blast modelling tool integrated with the AIM to produce a 3D database and associated visualisation. Professor Priyan Mendis, University of Melbourne, is chief investigator of blast modelling for the project.

Gardermoen Airport, 35km north-east of Oslo, opened in 1998 as an international airport on the site of an earlier military and charter facility. It is the second-busiest airport in the Nordic countries, with 219,352 aircraft movements in 2010.

Database of IFC-compliant software

A database of software applications that are compatible with the IFC standard is due to go live at the end of summer 2011, providing a single resource for users. The resource is the work of Jeffrey Ouellette of Nemetschek Vectorworks, who identified a gap in existing knowledge and was determined to plug it.



Jeffrey Ouellette, Nemetschek Vectorworks

'I started putting the list together in May 2010 as I was preparing presentations on the topic of openBIM for the National Convention of the American Institute of Architects,' explains Jeffrey. 'My goal was to make the value proposition resonate with an audience by showing how broad IFC support had become.'

Jeffrey had expected to find a dozen or so resources through buildingSMART's Implementation Support Group (ISG) and other development efforts in which Nemetschek Vectorworks had participated, but the reality was very different. 'I was stunned when my

first effort uncovered 50 applications by 37 vendors,' he adds.

He then approached Thomas Liebich (leader, Model Support Group) and Rasso Steinmann (leader, ISG) who immediately saw the potential of the list and the three discussed ways of making it an official buildingSMART resource. The data was moved from the original

Google Docs spreadsheet to an online database at buildingSMART-tech.org, but the earlier spreadsheet was kept active. With the help of other buildingSMART sources, more applications and vendors were added and the number of fields and types of data expanded. 'Now we are at the point where it is ready to permanently move out of a simple spreadsheet format and into a comprehensive database,' says Jeffrey.

So how many items of software will feature altogether? At the moment there are 132 applications and utilities by 88 developers listed in

the database. As more products with IFC compatibility emerge, they will be added. The list will offer definitive information about the extent of IFC adoption for software end users, such as architects and engineers. They will be able to browse the database and see the applications available for different disciplines and workflows. 'Architecture – and the building industry in general – is bigger than any one technology, product or vendor,' concludes Jeffrey. 'IFC provides a method of digital interoperability – and the new database will help promote the use of IFC-compliant software, allowing everyone to collaborate with the tools and process they find most useful.'

The current list is available at <http://bit.ly/gfnMW>. The database will be at <http://www.buildingsmart-tech.org/implementations>

The database will contain IFC-compatible applications for architectural, structural, building services, FM, model viewing and other disciplines. Every entry in the database has an application name, discipline category, application URL, version(s) supported, IFC version(s) supported, import and/or export support, certification status, vendor, vendor url, and vendor contact.

Strengthening our chapters

How can chapters identify if they are operating at full strength and know what to do to gain more clout in the industry?

Telltale signs that a chapter is running in a low gear include a drop-off in membership or the level of activities. The buildingSMART roadmap, which will shape the organisation over the next decade, has a section on how to strengthen a chapter.

Any chapter that wants to review itself should look at its own structure. Do board members have good contacts in industry or government? Is the chairman providing strong leadership? 'Find the right people,' the Roadmap recommends. 'Champions or leaders to drive projects are essential, but they need an active support group.' And the Roadmap advises chapters to 'find "strategic members" – key firms and people to lead in each domain'.

In practice, the answer might be to bring better-connected people on to the board or just to define roles more closely, so that board members have a more specific sense of purpose.

Networking and communication are also essential, and the Roadmap asks chapters to explain the business improvement agenda, rather than the technology agenda. In planning their activities, chapters are advised to 'tackle the most important issues first' but also to 'look for "quick fixes" to keep members engaged'.

'This guidance on how to strengthen chapters comes at a time when we are seeing a disparity between very active chapters and those that have lost momentum,' says bSI's business manager, Chris Groome, who advises new chapters on how to benefit from participation in the buildingSMART family. 'The roadmap offers practical ways to inject new impetus and purpose into a less active chapter.'

See Roadmap 2020, section 4

<http://buildingsmart.com/events/ic-meeting>

IFC – Towards accreditation

Three rounds of balloting – or approval – are required when a standard is accepted as a full ISO standard. The buildingSMART standard IFC2x4, also known as IFC 4, has just completed the first round with unanimous approval. 'We are now entering the endgame and are confident that our work will pay off,' says Thomas Liebich, who leads the Model Support Group.

Building stronger chapters

People

- Find the right people. 'Champions' or leaders to drive projects are essential, but they need an active support group. Don't rely on one or two overworked people
- Involve as many as possible in activities or workshops
- Drop those who don't contribute
- Find 'strategic members' – key firms and people to lead in each domain

Communicate – identify the benefits

- Explain the business improvement agenda, not the technology agenda
- Start by identifying what is needed, then develop, promote and deliver
- Communicate effectively to recruit and retain members. Be visible

Activities

- Don't take on too much. Start slowly and build activities
- Tackle the most important issues first
- But also look for 'quick fixes' to keep members engaged

Network

- Get close to industry associations and government bodies to try to influence their agendas. Get to know the key individuals

International User Group

A chairman is to be recruited for the International User Group. The elected officer will give a high profile to user requirements, represent end users in liaising with software companies and give a strong steer to technical work. The IUG chairman will also have a place on ExCom.

See <http://www.buildingsmart.com>

Benelux industry day

The Benelux chapter is holding an industry day on 9 November in Oegstgeest, the Netherlands, with Leif Granholm of the Middle East chapter giving the keynote address. International delegates will be welcome.

Details from Benelux chairman gerrie.muhren@buildingsmart.nl

Jordan pledges commitment to BIM

A buildingSMART forum has been set up in Jordan as part of buildingSMART Middle East. The two main players in Jordan are the Ministry of Public



Works and Housing and the Jordan Engineers Association (JEA), who have entered into an agreement with the Middle East chapter and will be running the forum. 'The ministry will support ambitious initiatives which enhance the construction sector,' said minister Yahya Al Kasbi.

Sharing his commitment, Abdulla Obaidat, head of the JEA, added: 'This is an important agreement as it will introduce international concepts of modern buildings and increase the competitiveness of Jordanian engineers across the international and regional market.'

Roadmap 2020 – update

The bSI strategy was presented to the International Council in Boston in May. The council supported the strategy – or roadmap – but requested some changes. In particular, they asked for timings to be set for developments described in the roadmap. These changes have now been made, with implementation of parts of the strategy brought forward. The strategy also includes the funding of two full-time jobs: a CEO and an assistant. These roles will be externally oriented and the two senior officers will be expected to meet high-level industry figures and members of government around the world to stimulate support for the buildingSMART approach.

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