

Annual Report 2013



buildingSMART®

International home of openBIM®

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buildingSMART's mission

Proactively facilitate with key leaders and influencers the active use and promulgation of standards enabling civil infrastructure and buildings asset data and life-cycle processes to be seamlessly integrated (open BIM standards), improving the value achieved from investments in the built environment and enhancing opportunities for growth.

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Better practices for a changing world

2013 was a significant year for buildingSMART International. Our data model, IFC4, was accredited by ISO in the spring, giving further weight to a standard that is central to the use of open BIM. Accreditation will ensure that the buildingSMART standard reaches a wider market.

Software vendors can submit their products for buildingSMART certification – a service we offer which tests for compliance with our standard and gives assurance to end-users. In 2013 we certified 14 products from 6 vendors.

The remit of our work has expanded with the launch of the Infra Room, as we extend IFC to infrastructure. One of our major infrastructure projects, on alignment, secured the necessary funding and moved into action. Elsewhere our project on a Model Coordination View for IFC4 – an important addition to the data model – secured partial funding and work started to define the project. Our Data Dictionary project moved forward with the development of a new platform and an interesting pilot on international terms.

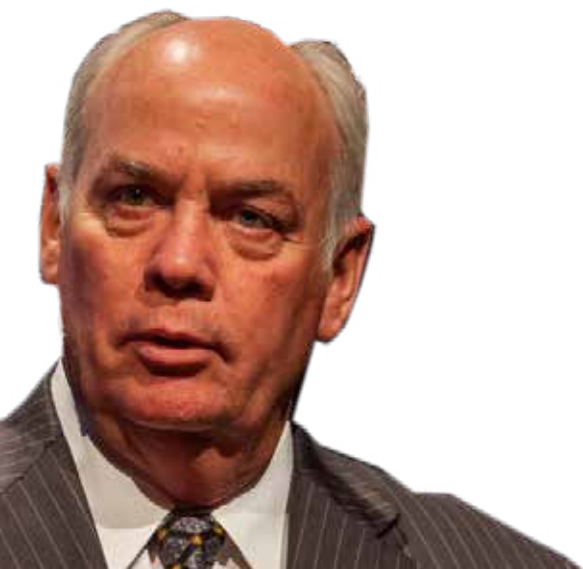
Our chapter network has expanded with the launch of two new chapters – in China and Hong Kong – during the year. This expansion is a clear indication that more markets are recognising the measurable benefits that open BIM enables.

At buildingSMART, we are changing too. In my paper, *The Way Forward*, released in May 2013, I set out proposals for equipping our organisation to meet the needs of a changing world. Through our internal changes, we will be well placed to help unlock more efficient and collaborative ways of working – to the benefit of the project during its whole life-cycle and to all the players.



Patrick MacLeamy

May 2014



Executive summary

The major achievements of buildingSMART International in 2013 were as follows:

- IFC4 was approved as an ISO standard (ISO 16739)
- Fourteen software products from six different vendors were certified as complying with IFC2x3
- The Infra Room was launched in March and four top priority projects in the field of infrastructure were identified in October
- The alignment project of the Infra Room secured funding of €200,000
- The bSDD improved its technology platform and completed an international pilot
- A project to develop international BIM guidelines was launched in October
- A list of priority technical and user projects was created as a basis for future work
- A new version of the BIM Collaboration Format was developed
- The Simple ifcXML format was finalised and integrated into IFC4
- Two new chapters were launched in China and Hong Kong.

Highlights of the year

Software certification

BuildingSMART International offers an independent certification service for software vendors who are members. During certification, a software product has to undergo a series of demanding 'test cases' to show that it complies with the buildingSMART IFC standard.



Certification offers a range of benefits: it acts as a quality assurance system, enabling the product to be improved as the test actions reveal weaknesses. Importantly, a certified product assures the user that it meets a trusted international standard and provides the client owner with the confidence that the project is using compliant software.

The current certification system is 2.0 and makes a clear distinction between import and export functions, with stringent quality checks.

In April 2013 the first five products to achieve compliance under Certification 2.0 completed their tests and the vendors involved announced their satisfaction with the thoroughness of the process.

Certification 2.0 uses a web application, the Global Testing and Documentation Server (GTDS), which provides automated online testing of IFC files and tools for the documentation of manual tests. Products are tested for compliance with IFC2x3. Testing for IFC4 is expected to start by the end of 2014.

There is a trend towards clients requiring their suppliers to use certified software – a trend that will only increase. In Norway, four large public sector clients announced in 2013 that they would require their supply chain to use buildingSMART-certified software from July 2016.

During 2013, 14 products were certified by buildingSMART.

Developments in IFC4

A milestone for the buildingSMART data model was reached in spring 2013 when IFC4 was approved as an ISO standard – ISO 16739. IFC was already a widely respected standard and implemented in many software products but achieving ISO accreditation with the more extensive IFC4 gives the standard serious clout.

Many public sector clients – especially in Asia – require the use of ISO standards on their projects. This means that IFC and open BIM will now reach new constituents around the world – something an industry standard cannot always do on its own.

The process of ISO accreditation, with its intensive internal and external reviews, was frustratingly time-consuming but the quality of the standard has justified it. BuildingSMART is confident that IFC is the only open, comprehensive and international standard covering most of the workflow using BIM in construction projects.

There is more work to be done on the data model. The next step is to create a Model View Definition (MVD) covering various aspects of coordination for the new IFC4 platform. It will replace the old IFC2x3 Coordination View 2.0 which has served its purpose well.

An MVD is a subset of the IFC standard, and one of the most important of these subsets is the Model Coordination View. This is the view that supports the exchange of architectural, building service and structural building information models, for example to search for and detect any clashes.

Model View Definitions (MVDs) define the subset of the IFC-data model that is necessary to support the specific data exchange requirements of the AEC industry during the life-cycle of a construction project

It also supports activities such as consistency control, building code checking, coordination of voids and the tighter integration of architectural, mechanical and structural design and detailing. If the benefits of IFC4 are to be exploited, a new Model Coordination View is essential.

In October 2013, funding for developing the IFC4 coordination was secured from the Norwegian National Office of Building Technology and Administration. Unfortunately, during 2013 matching funds could not be secured from similar organisations in other countries, and the project had to be scaled back. Other sources of funding will be sought in 2014. A revised plan was agreed in December 2013, with work due to start in January. The project will run until August and is being carried out by the bS Model Support Group. Results are expected to be available in September 2014.

The international software community – notably the companies who participate in the bS Implementation Support Group – will then be able to implement the Coordination View and IFC4 in software products.

Once it is completed and ready, the Model Coordination View will become a buildingSMART standard. No decision has yet been taken as to whether accreditation as an ISO standard should be sought.

Infra Room

In March 2013 the buildingSMART Infra Room was launched, with the ambitious goal of extending IFC to infrastructure. IFC had already proved itself an essential tool in interoperability in building and the need for a similar standard for infrastructure had become clear. A meeting in Paris in July 2011 kickstarted the process.

During 2013, 12 project topics were identified as the principal areas for developing IFC for Infra. Of the 12, four were chosen as top priority: alignment, IFC Bridge, a data dictionary for infrastructure and the delivery of as-built information for asset management.

‘Alignment’ is the route of a road or rail track, defined as horizontal and vertical reference curves. The construction of roads, tunnels, rail tracks, waterways, bridges and power lines all depend on alignment, and the creation of an alignment model will bring benefits to all the parties in an infrastructure project. In October 2013, a positive start was made when funding of €200,000 was secured through an agreement with Swedish and Dutch governments and the EU. The project is due to run from January to December 2014. The Open Geospatial Consortium has also done work in this area through its Land and Infrastructure working group, and the bSI project team is collaborating with the OGC group to further their common interests.

At the end of 2013, the Infra Room was putting together a plan of action for the other three top priority projects. IFC Bridge is a continuing project, with extensive development already under its belt and close links with the MINnD project in France (Modélisation des Informations Intéropérables pour les Infrastructures Durables) and the four-year EU Virtual Construction for Roads (V-Con) project. MINnD has funding of €220,000 to develop the specification for extending IFC to bridges; it also has funding to explore various use cases for infrastructure, including the areas featured in bSI’s 12 project topics. In future, IFC Bridge is to be considered primarily as a buildingSMART project. Project summaries for the infrastructure data dictionary and for the delivery of as-built information were due to be prepared in the early months of 2014.

Work is also being done in Korea on infrastructure modelling for roads and this work will be linked to the European work.

Data Dictionary

The buildingSMART Data Dictionary (bSDD) — is a web service for identifying the objects used in building information models and their properties. The bSDD, formerly known as the International Framework for Dictionaries (IFD), helps consolidate different terms for the same concept, so that information can be exchanged accurately between authoring tools or downstream applications.

The Data Dictionary offers a powerful tool to digitally connect external information such as manufacturers' products to a building information model, so that designers and facility managers have lasting access to information about the building – from major components to small-scale fittings. In other words, manufacturer product libraries will be linked into a BIM.

The Data Dictionary, originally formed through a partnership between several current members of the Product Room Steering Committee – Construction Specifications Canada, Construction Specifications Institute, STABU (now the Netherlands Concept Library, CB-NL) and buildingSMART Norway – struck in 2006, will enhance the benefits of open BIM. In 2013, significant progress was made on the bSDD, leading up to the release of the latest version and helping move it from an ideal vision to an achievable reality.

The bSDD technology platform has been improved. Working in partnership with the Product Room Steering Committee, the Norwegian software developer, Catenda, created a cloud-based API (application programming interface) for the Dictionary. The



Case study

The bSDD pilot on shared content development

In October 2012, the Product Room set up a small pilot project to assess the current tools and procedures for identifying and entering product types and attributes into the Dictionary. A ceiling panel for a suspended ceiling system was the first item chosen for the project. Each country added their terms to a master worksheet and was responsible for aligning their content with information from other countries. A test environment was provided by Catenda.

This was an international effort, running over the first half of 2013, with participants from the UK, US, Norway, Canada, France and Sweden, and observers from Japan, Austria and Germany.

'International English' was used as the common language, and the collaboration resulted in the ability to translate a UK specification clause for a ceiling infill unit into Norwegian and other languages. Just as important as the successful outcome was the opportunity to explore the requirements for using bSDD effectively, such as tools to amend dictionary content. The pilot led to a follow-on second stage, with expanded participation from Australia, Denmark, Estonia, Netherlands and New Zealand, and has helped the Product Room identify the priority development needed.

new API is built on Google App Engine and offers improved flexibility and excellent scaling potential. In October 2013, an agreement was reached between bSI and Catenda, which hosts the bSDD on behalf of bSI and supports the user community.

Many individual countries are working on their own object libraries. In the UK, for example, the NBS National BIM Library has put huge resources into developing BIM objects with information derived from standardised product templates. In the Netherlands, a nationwide concept library initiative, known as CB-NL, which has support from government and private industry, is making measurable progress on a system to improve information exchange and collaboration for buildings and infrastructure.

In 2013, bSI and CB-NL agreed to collaborate and a two-year development agreement was signed. CB-NL will add its content into the bSDD, so the CB-NL content will be integrated with the bSDD. After the development period, CB-NL will use the Dictionary as the way to exchange information with others outside the Netherlands, using bSI standards.

Progress was made on another front in 2013, with the continuation of a pilot project to help develop tools and procedures for entering, preparing and entering data into the bSDD (see box, page 9). The pilot highlighted practices and procedures for working with the dictionary. A second phase of the pilot, using a variable air volume (VAV) terminal box as the object to model, was launched to test the content management tool being developed by Catenda.

Moving into 2014, the Product Room expects the next phase of development to continue the work on content management tool development and content guidelines. More product manufacturers are being encouraged to get involved.

The bSDD is managed by the Product Room Steering Committee and Technical Working Group. Group members have extensive experience with building information libraries and bring considerable expertise to the Dictionary project, in the areas of classification systems, master specification systems exchange standards and BIM for all phases and types of construction work.

BIM guidelines

As BIM has blossomed around the world, guidelines on how to use it have started to emerge. Work on comparing guidelines had already begun in the US where an NBIMS subcommittee had proposed a template method to compare BIM guidelines from around the world. The Process Room recognised that project owners will soon be faced with a bewildering choice when it comes to determining a set of guidelines for their projects. Moving forward with this work, it launched its BIM guidelines pilot project in October 2013, following the technical meetings in Munich.

The feasibility phase of the project entailed completing reviews for an initial list of ten existing BIM guidelines. This database could then be tested against the complex search and compare capabilities of the wiki tool. Second-generation wikis are highly flexible in their ability to provide users with the information they need, and the BIM guidelines wiki is expected to be a valuable tool in this respect. Collaboration on this project has been a truly international effort with representatives participating from three continents. The first results from the pilot project were expected to be presented during the international meetings in Stockholm in March 2014. Going forward, the project could provide sufficient data to support development of an international framework for BIM guidelines. Progress to date has been met with enthusiasm and support, both within buildingSMART and industry at large.

Priority projects

BuildingSMART International has developed a programme of priority projects and relies on working with partners and sponsors to take them forward. The projects enable both technical development and the effective use of open BIM, with each project individually funded and organised.

A list of priority projects has been developed by bSI, in consultation with those who most need the benefits that the completed projects would bring. Among its short list of priority projects, a number are underway, including the buildingSMART Data Dictionary (bSDD), IFC for Bridges, alignment and the BIM guidelines. The Model Coordination View project is just starting. These projects are described elsewhere in this report. Other priority projects are buildingSMART's own business plan, the IFC4 primer, the development of tools to check BIM models, and the integration of IFC and the Data Dictionary, with tools to map external data to an IFC-based (open) BIM.



Case study

Open BIM in practice

The use of open BIM, in projects large and small, offers benefits both to the project owner and the supply chain. This was clearly demonstrated in the Hagebyen project in Fornebu, west of Oslo in Norway.

Main contractor Veidekke Entreprenør specified that subcontractors had to work in open BIM and provided the base information for the subcontractors to develop their own individual models for the separate disciplines and for site operations. Suppliers responded positively to the open BIM regime, citing improved accuracy and higher-quality products among the benefits, together with the ability to identify safety risks via the model.

The use of BIM for scheduling, notably on phase 1, also led to schedule improvements, while continuous task clash avoidance with BIM during construction reduced the schedule further. The trades also experienced time savings.

Project owner, main contractor and suppliers were all satisfied with the results achieved through the use of open BIM and confident that they would continue to use it in the future.

A long list of projects has also been developed, embodying bSI's aspirations for the AEC industry and the needs of clients. By identifying the areas where the technical development of standards and tools will really help the industry, together with priority user projects, bSI has positioned itself as ideally placed to spring swiftly into action once a project's structure is agreed and funding secured.

BIM Collaboration Format

The open BIM Collaboration Format (BCF) is a standard that allows users to share comments using their own software tools. It was developed from 2009 onwards by Tekla and Solibri with DDS and is now found in authoring and review tools used by a variety of disciplines, either in their native format or through add-ons. Using BCF tools, participants can share the red-lining mark-up and comments linked to BIM objects, so that designers can make comments and view those of others. The BCF is interoperable and can be converted to and from IFC through IfcApproval so that BCF messages can be stored in design management databases, in IFC and in other model servers. It has proved a valuable means of facilitating collaboration on building projects.

In 2012, buildingSMART adopted version 1 of the standard and now hosts the formal definitions and examples. But interest in the standard is growing. Its coverage is being extended and the definitions improved. During 2013, the BCF Taskforce of the Implementer Support Group, which includes the original authors, worked to develop version 2. The new version has technical extensions, such as the use of multiple screen shots that provide better support of workflows.

The open BIM Collaboration Format is an example of buildingSMART recognising excellence in a commercially produced standard and, with consent, adopting it as a bS standard to confer independent authority on it and encourage wider take-up.

Simple ifcXML

Once the buildingSMART data model had been developed, it became clear that not all software developers and end-users required the full IFC model, which was too complex for their needs. The answer was Simple ifcXML, a



lighter version of the IFC standard. Simple ifcXML allows developers and users to flatten and simplify the data structures for specific purposes and present the result in the more familiar XML format.

Work to define Simple ifcXML began in 2011. It is now integrated with IFC4 and was finalised at the same time in March 2013. The work built upon earlier achievements of an ifcXML representation that was originally published for use with IFC2x3 in 2005. The work was led by the Model Support Group (MSG), with input from software developers, such as DDS and Jotne EPM Technology in Norway.

Being fully integrated with IFC4, Simple ifcXML is now another option for exchanging BIM data, in addition to the traditional IFC file format. It can be used by software developers who are eager to support IFC4-based solutions.

Comparisons between the new Simple ifcXML for IFC4 and the earlier ifcXML for IFC2x3 show that the file sizes are reduced dramatically – with the new version, they are down to one-third (or even one quarter) of the previous file size. This has been welcomed by developers. In the words of one software vendor, ‘with the new Simple ifcXML, IFC data looks like real XML as developers would expect’.



Model Support Group

XSD	<pre><xs:element name="IfcPostalAddress" type="ifc:IfcPostalAddress" substitutionGroup="ifc:IfcAddress" nillable="true"/> <xs:complexType name="IfcPostalAddress"> <xs:complexContent> <xs:extension base="ifc:IfcAddress"> <xs:sequence> <xs:element name="AddressLines" nillable="true" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element ref="ifc:IfcLabel-wrapper" maxOccurs="unbounded"/> </xs:sequence> <xs:attribute ref="ifc:itemType" fixed="ifc:IfcLabel-wrapper"/> <xs:attribute ref="ifc:cType" fixed="list"/> <xs:attribute ref="ifc:arraySize" use="optional"/> </xs:complexType> </xs:element> </xs:sequence> .. </xs:extension> </xs:complexContent> </xs:complexType></pre>
IFC File	<pre>#74= IFCPOSTALADDRESS(.OFFICE., 'AEC3 Germany', \$, \$, ('AEC3 Deutschland GmbH', 'Wendl-Dietrich-Str. 16'), \$, 'Muenchen', \$, '80634', 'Germany');</pre>
ifcXML File	<pre><IfcPostalAddress id="i74" Purpose="office" Description="AEC3 Germany" Town="Muenchen" PostalCode="80634" Country="Germany"> <AddressLines> <IfcLabel-wrapper>AEC3 Deutschland GmbH</IfcLabel-wrapper> <IfcLabel-wrapper>Wendl-Dietrich-Str. 16</IfcLabel-wrapper> </AddressLines> </IfcPostalAddress></pre>

Table 8: Example of aggregated STRING data type that can contain space characters

The work was funded by BE (National Office of Building Technology and Administration, Norway), with further contributions from the Mefisto research project, which was itself partially funded by the German Federal Ministry of Education and Research.

Finance

At the 2013 meeting in Espoo the International Council supported the recommendation of the Board of Directors (ExCom) to start employing a full-time professional staff member. It was recognised that the benefits in terms of increased funding would lag behind the increase in costs. The main feature of the financial outcome for the year was therefore a modest increase in revenue from £360,043 in 2012 to £392,666 and a bigger increase in expenses from £335,790 to £467,977. As a result a surplus of £24,253 became a deficit of £75,311 and the retained surplus fell from £99,828 to £24,517. The main reason for this deterioration was the cost of the recruitment and employment of a chief executive designate.

The other main feature of the financial year was the replacement of the company's bank. BuildingSMART International had used the Bank of Scotland since its formation in 1996. However, the performance of the bank had deteriorated so much in 2013 that carrying out simple transactions became impossible for a period. The directors therefore closed the company's accounts with the Bank of Scotland and transferred the business to HSBC.

The bSI network

Chapters

BuildingSMART consists of a network of chapters, representing a single country or small cluster (such as Benelux and Nordic). The individual chapters are members of buildingSMART International; they in turn have a membership consisting largely of AEC companies, large public sector clients, software vendors, professional institutions and universities.

In January 2013 there were 14 chapters: Australasia, Benelux, Canada, French-speaking, German-speaking, Italy, Japan, Korea, Middle East, Nordic, Norway, Singapore, UK & Ireland, US. By the end of the year, two new chapters had been formed and affiliated with bSI: China and Hong Kong.

The work of nurturing a new chapter is sometimes slow and always painstaking, as a representative of bSI takes the prospective host

organisation through the business of preparing for affiliation. In this way, the new chapter knows what to expect and a reciprocal relationship is forged. During the year, the possibility of creating chapters in several new territories was explored, including one in Spain.

There are also two buildingSMART special interest groups in Sweden and Shanghai. Their activities mirror those of the full chapters. The Swedish group is part of the Nordic chapter and has its own programme of events, while the Shanghai BIM interest group provides a platform for regular presentations and holds an annual user conference. The emphasis is on finding practical solutions to common problems that impede interoperability.

Elsewhere in China, the launch of the two Chinese chapters was an encouraging sign that powerful economies with big building programmes are taking the buildingSMART concept on board. The Hong Kong chapter launched in April. The China chapter followed suit in May, with an inauguration event in Beijing that drew an influential audience.

Chapter management is devolved to the individual chapters. They encourage user uptake of buildingSMART standards, hold industry days and in some cases have training programmes. They contribute to multi-country bSI projects, as partners, and also take part in local projects.

One colourful example of collaboration across the globe was Build Sydney Live in October 2013, when bS UKI member company Asite collaborated with buildingSMART Australasia to set up a 48-hour virtual design competition to create a new convention centre in the Darling Harbour area. The competition attracted teams from all



New chapters launch in Beijing (top) and Hong Kong (below)

around the world and offered the chance to experiment with design ideas using interoperable BIM.

As the year ended, a new strategy was being developed to strengthen the links between buildingSMART International at the centre and the chapters at country level.

Communications

Website

The bSI website (www.buildingSMART.org) is used both by first-time users and regular visitors. Eighteen months ago, work began to improve the content and presentation, much of which was unwelcoming and dated. Some content has been rewritten, the presentation smartened up and the navigation improved.

Importantly, the home page has been reworked so that bSI's goals and activities are much clearer, and the page now gives direct links to sections of the greatest interest. Wherever possible, visitors can now locate most information within three mouse clicks.

During 2013 a new section was introduced relating to the certification of BIM software. The IFC Certification 2.0 scheme is explained, and there is a separate page listing the software products that have achieved buildingSMART accreditation.

In addition to the main bSI website there are three sister websites dealing with technical matters, user involvement and the buildingSMART data dictionary. These sites are run separately by their specialist stakeholders, with clear links from the bSI site.

Newsletter

The bSI newsletter is published quarterly and posted on the bSI website. It gives news of bSI activities and projects, with IFC4, the first Certification 2.0 successes and Patrick MacLeamy's *Way Forward* strategy all featuring prominently in 2013. The newsletter also covers buildingSMART events, projects with local chapter involvement, BIM case studies and interviews. The writing is



*Sustainability by
building SMARTER*

NEWSLETTER • No 13 • August 2013

The only game in town
Chairman sets out his vision

Patrick MacLeamy, bSI chairman, set out his vision for the future of buildingSMART International in a paper presented by ExCom to the International Council at its meeting in Helsinki in May. 'We are at a true turning point,' he argues. 'The world has awakened to the promise of openBIM – and bSI is the only game in town.'

The paper, entitled *The Way Forward*, should be read in conjunction with the bSI new strategy, Roadmap 2016 (under revision) and the bSI business plan, which is being developed by ExCom. *The Way Forward* charts bSI's future development as a standards organisation, emphasising how its standards and tools will play out in the real world.

Strengths and weaknesses

In his paper, Patrick starts by setting out the strengths and weaknesses of bSI. Among the strengths are its global reach and influence, its commercially neutral positioning and a team approach, drawing on expertise from around the world, not least from the officers and volunteers in member organisations. It is this core team that has developed the technical work.

But there are weaknesses, which Patrick acknowledges. The chapter-based structure means that if some chapters flag – for reasons such as economic recession in the home country – there is a knock-on effect for bSI, which is largely funded by contributions from the chapters. The reliance on voluntary or semi-voluntary labour, much of it part time, is hindering the acceleration of new technical development.

The new look

Several strands will weave together in ensuring that bSI grows beyond its present status and achieves its goals as the premier institution for technical and user standards. One is leadership: a paid professional leadership is envisaged as key to transforming bSI's effectiveness. And the use of full-time paid professionals would complement the consultancy work being done, at the highest level of competence, by bSI officers. Secondly, external sponsorship would offer the means of undertaking more projects. Thirdly, an international advisory board would allow key players to have an immediate say in forthcoming work.

Over the past 18 months, the structure of bSI has been reorganised into three 'rooms' or centres of activity: the Process Room, the Product Room and, most recently, the Infrastructure Room. A Technical Room (covering bSI standards and certification) underpins these three rooms.

What next?

So what work would a strengthened bSI want to tackle? *The Way Forward* lists the high-priority projects that bSI has identified, assigning them to six categories, to meet user and technical needs, as well as foundation work and certification. These are projects that will make open BIM a reality: certified software that allows integrated working, with software tools that do what is needed and end-users educated to deploy them, intelligent handover information and the first stages of the vast task of extending IFC to infrastructure.

There is much to be done, and having well-defined priorities and the right working structure are the best possible start.



Helsinki meeting in May

The International Council of bSI met in Helsinki during 22-23 May 2013. Two items stood out at the event. The first was a new strategy document, *The Way Forward*, written by Patrick MacLeamy, bSI chairman (see main story). The other item that attracted much interest was a presentation by Mark Dew, bSI UK chairman, on developments in the UK government BIM programme. The experience of the UK, as a large economy, in paving the way for required BIM use in public sector projects is expected to offer big rewards to UK public clients and inspiration and lessons to other countries.

Implementing IFC4

One important resolution of the Council concerned the IFC4 standard, now accredited as a full ISO standard and representing a step change from the previous release, in coverage and convenience. End-users need to have access to it in the software products they buy, and the Council asked its two influential groups, the International User Group (IUG) and the International Technical Management Committee (ITM), to give the roll-out of IFC4 a high priority in their dealings with the software industry. Software that complies with IFC4 will need prompt certification, so bSI's certification service needs to gear up to meet future demand for checking and quality assurance of IFC4-compliant products.

Structure, administration and finance

Other resolutions covered the creation of a new Nomination Committee to vet nominations for officers and ExCom (this was an election meeting), the formal naming of the infrastructure centre of activities as the 'Infrastructure Room', and budget proposals, with ExCom asked to produce a 'base budget' and a 'target budget'.

Resolution 2011

asks IUG and ITM to give high priority to IFC4 software implementation'. See www.buildingsmart.org under Resources (where *The Way Forward* can also be downloaded).





Activities at a local level

The chapters carry out local projects, promote open BIM uptake, hold industry days and run training programmes. Member companies of chapters are often involved and some activities are cross-boundary. Here are a couple of highlights from 2013.

Build Sydney Live

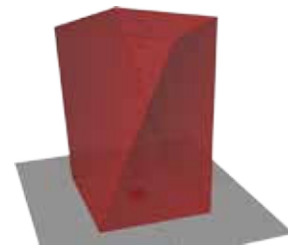
A virtual design competition, open to teams around the world, took a site at Darling Harbour, Sydney, as its point of departure. In a fast-track design exercise, the competing teams were asked to build IFC models and submit their designs in just 48 hours. The full brief was only revealed at the start of competition on 28 October 2013 and set out the criteria: the teams had to demolish an existing convention centre and design a new green building with multiple facilities. Their ingenious designs demonstrated persuasively the power of collaborative working with open BIM.



The event was organised by UK-based software company Asite, together with buildingSMART Australasia.

IFC4 for complex geometry

Some of today's architecture features complex shapes which up till now have defied efforts to bring them into the architectural design model. In an example of early uptake of IFC4, an architect at member company HOK in New York – Christopher Zoog – was swift to start exploring new workflows that have been made possible by IFC4. Software vendor Grasshopper is an early adopter of IFC4 and it has used the new standard in its Rhino plug-in which allows architectural forms to be generated using generative algorithms. Thanks to the IFC4 support and Christopher's pioneering work, a complex form – part of a design for a major new hospital building in New York City – could be brought into the main architectural model. This marked a promising step in a world of better workflows to come.



straightforward and accessible – many readers do not have English mother tongue – and it avoids technical jargon and dry-as-dust business speak.

Special supplements and 'news extras' are published from time to time, covering individual topics of particular interest. In 2013, there was a four-page supplement on the accreditation of IFC4 as an ISO standard and two 'news extras' – one on early adoption of IFC4 and the other on a data dictionary pilot project.

BuildingSMART working groups and the individual chapters are welcome to reuse material from the newsletter, with attribution, so the content has the greatest possible impact.

Press releases

News releases aimed at companies and the media are published on an ad hoc basis. Our news release on the first products to receive Certification 2.0 was disseminated through our members' influential distributions lists and posted on the bSI website. Greater engagement with the media is planned, through articles and press releases, when resources permit.

Governance

Structure of bSI

The governance of buildingSMART International is organised through a council and executive committee at the top and working groups at the level of research and implementation.

The International Council – made up of 31 members from 15 regional chapters – meets once a year in May. It is served by an Executive Committee (ExCom), which comprises eight members, covering the functions of treasury, user activity and technical management, and strategic oversight. ExCom meets virtually once a week, through conference calls.

Plans for transformation

During 2013, it became clear that bSI would operate more effectively and become a more attractive partner to external organisations if its internal structure and approach to projects were rationalised.

In May 2013, Patrick MacLeamy, bSI chairman, presented a paper, *The Way Forward*, to the International Council, arguing that the industry was at a turning point. ‘The world has awakened to the promise of open BIM to deliver higher quality, greater certainty and cost reductions of around 20%,’ he said, describing bSI as ‘the only game in town’. To meet growing industry needs in the age of open BIM, he proposed a paid professional leadership, the creation of an international advisory board (to be called the Strategic Advisory Council) and the securing of sponsorship from foundations, industry associations and international organisations to fund vital technical and user projects.

Patrick MacLeamy’s paper was adopted by the International Council.

This Annual Report describes the governance in place at the end of 2013.

At the year-end, there were two standing committees, the International User Group (IUG) and the International Technical Management Committee (ITM).

There is also a quartet of working groups or ‘rooms’: Process Room, Product Room, Infrastructure Room and Technical Room (see below). The working groups come together at the six-monthly international buildingSMART weeks in addition to their own programme of meetings, in person and virtually.

The buildingSMART rooms

During 2012 and 2013, four ‘rooms’ – or centres of activity – were set up, covering both existing and new areas of work. The first of

these, the Process Room, is concerned with the processes around the use of open BIM, notably the buildingSMART standard for processes (formerly known as the Information Delivery Manual or IDM) and the BIM guidelines. The second, the Product Room, works on the common terminology that the market needs, using the buildingSMART Data Dictionary. The Infrastructure Room, launched in 2013, is tackling the extension of IFC to infrastructure. The Technical Room provides the expertise for defining standards, and its activities include input into the Data Dictionary. The technical work of buildingSMART goes back to its very early days, and provides the expertise that has led to the high-quality work embodied in the bS standards. To achieve greater integration of the work being done in the rooms, their leaders take part in the ExCom meeting to report progress once a month.

The Technical Room itself has several important subgroups: the Model Support Group (MSG), the Implementation Support Group (ISG) and the Technical Advisory Group (TAG).

List of officers

Executive Committee from 23 May 2013

Chair: Patrick MacLeamy

Deputy chairs: Reijo Hänninen and Rasso Steinmann

Treasurer: Nick Tune

IUG chair: Kjell Ivar Bakkmoen

ITM chair: Francois Grobler

Members: Alain Maury and Deke Smith

Secretary/business manager: Christopher Groome

Øivind Rooth and Jøns Sjøgren retired as deputy chair and treasurer respectively in May 2013

Leaders of the rooms and other activities

Christophe Castaing and Henk Schaap (Infra Room)

Roger Grant (Product Room and bS Data Dictionary)

Francois Grobler (Technical Room)

Jan Karlshøj (Process Room and IDM)

Thomas Liebich (IFC matters)

Rasso Steinmann (Implementation and certification)

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For more information on the case studies and material in the boxes, see buildingSMART newsletter 11, supplement and issue 12 (IFC4 used for complex geometry), issue 14 (Build Sydney Live) and 15 (Hagebyen housing project).

Website: www.buildingsmart.org

This Annual Report was written and designed by the bSI communications team

Front cover: Housing in Bermondsey, London (photograph by Jane Thompson)