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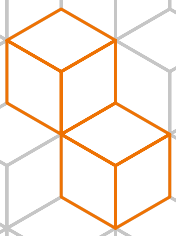
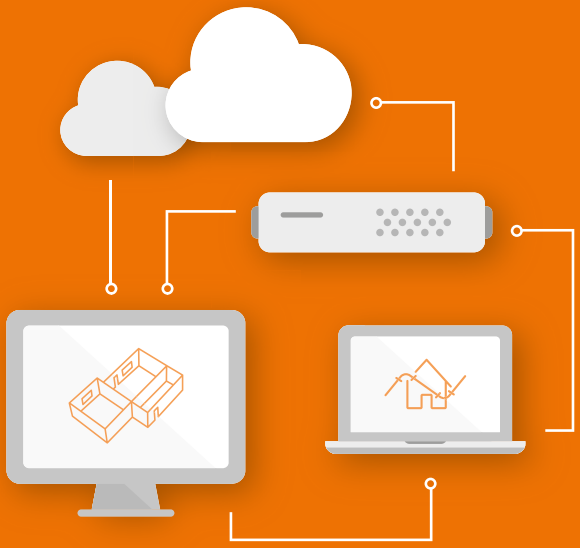
Why BIM?
How Data Exchange Impacts Projects

This is the second in a series of three articles that looks at the benefits of BIM.





Architects report that **HIGH EXCHANGEABILITY,** better **COLLABORATIVE WORKING** and **EFFICIENCY** are the main success factors of BIM.

In Belgium, France and Italy **HIGH EXCHANGEABILITY** by using BIM is seen as a great advantage.

Almost **40%** of the **BRITISH ARCHITECTS** consider better **COLLABORATIVE WORKING** to be one of the advantages of BIM.

EFFICIENCY was seen as the third success factor.

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1,400
ARCHITECTS INTERVIEWED

Building Information Modeling (BIM) is a critical tool for any designer who wants to stay competitive for the foreseeable future. Yet many are reluctant to make the change to BIM, being concerned about the time taken to learn and implement new systems. However, as project teams become more global and BIM becomes increasingly required by clients, architects and engineers need to be able to work and share data in an openBIM environment.

WHY BIM?

A recent study by USP Marketing Consultancy, entitled the European Architectural Barometer*, conducted interviews with 1,400 architects in eight European countries to determine the factors that bring the most benefits to designers who use BIM. While there are regional differences, three key success factors emerged from the study: collaborative working, exchangeability of data, and improved efficiency. In this three-part mini-series, we examine each of these success factors and take a closer look at the advantages to architects, engineers, and specialist designers.

*Index & Trends Q4 – 2017 | Theme: Building Information Modeling

HIGH EXCHANGE-ABILITY

EXCHANGEABILITY OF DATA

Closely linked to the ability to collaborate effectively and work efficiently is the ability to easily and quickly share information between the project team members. The globalization of projects combined with the fragmented nature of project teams makes this more important than ever. The right BIM platform helps ensure that model data, information, documents, and tasks can be shared and managed centrally over the complete building lifecycle. In this book, discover how an openBIM platform that enables loss-free information exchange can benefit your design projects.

EASY EXCHANGEABILITY

Interoperability during digital design – or cross-platform working without the loss of information and data, if possible – is crucial for a successful BIM project. It is a guarantee of a successful project, especially for major projects with a building and design time that lasts many years and requires comprehensive design services across many different disciplines.The use of neutral data formats across all disciplines is also called "openBIM". This contrasts with the use of data formats of only one program or one program family across all disciplines. This BIM method is also known as "closedBIM". Every BIM-enabled software has an open IFC interface that permits information exchange with another BIM software. The method name therefore merely reflects how the BIM-enabled software is used.

CLOSEDBIM RETAINS ITS VALUE

ClosedBIM is an option for data exchange still used to this day – usually within one software family, from only one manufacturer. It comes from a time when the open exchange of digital structural models across CAD platforms was not wanted or was not the focus. ClosedBIM still retains its value in drafting, design, construction execution, and building operation. That's because the loss of information in closedBIM design

has always been negligible, and the necessary compatibility is a given. This can offer major advantages for certain processes, such as with a steel company or prefabricated parts manufacturer: everything can be shown in one software family, from the design software, to the structural analysis, to the production programs – for example, in framework or steel construction. However, the key disadvantage of this working method is the lack of interoperability with software products outside of its own family, i.e. cross-platform collaboration with minimal loss of information and possibly without the creation of data silos. Or, in other words: the information from designers only retains its value in the closedBIM process by using software from one company.

OPENBIM REQUIRES AN OPEN EXCHANGE OF INFORMATION

Considering the history of BIM and of digital design, openBIM is – in principle – the logical advancement of a liberal digital design approach. It allows open, cross-platform, and manufacturer-independent data exchange and data archiving based on the IFC format, for which there is currently no alternative. And it will remain so for the foreseeable future, in the sense of a uniform "language" that is required to transfer, process, and exchange design data. OpenBIM complements the design process through the construction phase right through to operation. Above all, it offers major advantages in this area, which are still undervalued to date. For example, an as-built structural model can be used to create a functional facilities management (FM) model for the subsequent building operation. The COBie file format (Construction Operations Building Information Exchange) has become established here as the standard, which defines non-geometrical attributes required for facility management and therefore helps to describe the building's operation through to its demolition. OpenBIM supports the building lifecycle

and the entire project development process before, during, and after the building's useful life (Building Lifecycle Management, or BLM).

Read more about closedBIM and openBIM in our white paper:

OPENBIM AS THE FUTURE STANDARD FOR DIGITAL DATA EXCHANGE

INDUSTRY FOUNDATION CLASSES (IFC) FORMAT

In the BIM process, IFC supports the cross-discipline and cross-software flow of data between the central BIM model and the sub-models of the various disciplines and considers the working methods and necessary flows of information between the participants. As an example, the architect primarily works in a BIM-capable design program in order to create a design, the engineer uses different software to calculate the structural loads, show the gradients of forces or torques, and to design reinforcement, while the building services engineer also works in a specific software solution. The different sub-designs must then be merged back into the BIM model. IFC is the means of doing this.

For quantifying and specifying materials and products, the IFC interface is also available for tendering and calculation programs to import tender-specific information and interpret it. In addition, relevant information for scheduling and for cost and construction process control from BIM-capable planning software (e.g. Allplan) is also output in a compatible format for time and scheduling tools, which is enabled in the BIM process via IFC.

The advantages of the BIM working method and the IFC interface also extend to the production of prefabricated components or CNC-milled components. The machine control programs linked via IFC evaluate the modeled geometry, interpret it for the machine's working processes, and then translate it into a real product.

Computer-aided facilities management (CAFM) programs for the building's operation complete the applications of BIM and IFC. This is based on a simplified operating model, which contains only the relevant component information of the exact as-built model after construction is complete. This combines all the important information about technical installations, statics, components, maintenance statuses, and the service life of wear parts, such as lights or filters in ventilation systems. Databases are the source for such FM systems or CAFM programs, which are based on a consistent BIM model as a database. It is crucial here that the data of the operating model is transferred to the FM systems with minimal losses, such as through a cloud-based platform. To ensure this, work is ongoing to improve the IFC interfaces and the transmission standards.

Learn all about IFC in our white paper:

10 REASONS WHY IFC IS THE CENTRAL KEY TO SUCCESSFUL BIM PLANNING

EXPERT KNOWLEDGE
ALLPLAN IN DISCUSSION WITH BIM EXPERTS

buildingSMART:
Prof. Rasso Steinmann
Chairman German Chapter (middle)

ALLPLAN:
Stefan Kaufmann
Product Manager – BIM Strategy & New Technologies (right)

Thomas Müller
Product Manager Interoperability (left)

ALLPLAN: *"What technological and structural advantages does openBIM offer over closedBIM – and where is the current trend in the construction industry heading: towards closed solutions or towards openBIM?"*

Steinmann: "Open BIM solutions offer the advantage of being able to create various planning tools. In consortia, you can use them to merge the partners in a freer combination – without to compulsively refer to a particular planning software. I think that in practice not only openBIM or only closedBIM can be used. It will be used in the respective situation what works best. If we want, with the help of the BIM method, to achieve a good organization, it is irrelevant whether closed or openBIM. In a closed BIM solution, however, one is more limited. Because only those who have these planning solution in operation and are trained for this software will participate in it."

ALLPLAN: *"The next step for real open digital workflows and BIM is the establishment of openBIM for an open exchange of information. Which hurdles have to be overcome?"*

Kaufmann: "The development in building construction is already very advanced. But openBIM in construction means far more than building construction. There are many areas in which BIM is not yet established and where we still have a lot to do to make progress. We must therefore see the widespread use of BIM as a long-term development. Many things that we will need in the future will be based on a collaborative planning process based on BIM.

IFC4 is an important step in this direction. With IFC4, for example, we have addressed the addition of parametrics. In addition, there is the BIM-GIS integration as well as the integration of building products and building product catalogs, which has been demanded by planners and architects for years. Another point is the development of BCF. Data exchange with BCF not only refers to the model data, but to the entire information exchange in the project. With BCF, we have an important interface with which we can, for example, manage joint to-do lists in the future and process problems in planning or on the construction site in a structured process."

ALLPLAN: *"How do software manufacturers support architects and technical plan-ners to anchor the advantages of BIM and openBIM more firmly?"*

Müller: "BIM or openBIM is a workflow, a work process. We accompany our customers in this process right from the start: from the model quality in our software to the finished, exchangeable model, which in current BIM processes is usually an IFC file with certain properties and certain attributes. We support our customers in pilot projects, in which we weigh up the requirements together with them. In some cases, we then adapt the software so that he can continue working on his project. This is a benefit for him but also for us. Because what we extract from the project and incorporate into the software can also be valuable for other customers and other projects. In addition, there are specific modeling trainings and a training program certified by buildingSMART."

SUMMARY

The fragmented nature of project teams means that the ability to exchange information with other parties continues to be a major factor in the success of BIM. For a project to achieve its full potential, the project team members need to be able to share data seamlessly and quickly, ideally with real-time access to a shared cloud-based model (such as offered by Allplan Bimplus). Without this, collaboration becomes more difficult and more errors and inefficiencies enter the development process. While closedBIM still offers some value for specific areas and functions, the most effective way of working – the method of the future – is openBIM. As BIM maturity increases, Level 3 BIM will become the accepted way of working, which will be supported by cross-platform, cross-manufacturer, cloud-based working via IFC formats. And as BIM becomes more widely adopted, its use will spread to other areas such as estimating, quantity surveying, CNC design and production, and facilities management, which are currently in the early stages of development and use. Hence, being able to exchange information with a range of different software packages is an essential requirement for any BIM implementation.

LESS ERRORS

About the Company

ALLPLAN is a global developer of open solutions for Building Information Modeling (BIM). For more than 50 years, ALLPLAN has pioneered the digitalization of the construction industry. Always focused on our clients, we provide innovative tools to design and construct projects – inspiring users to realize their visions. With seamlessly integrated BIM solutions, ALLPLAN connects all project stakeholders:

- **Allplan Architecture** – for architects, delivers complete creativity and project control, enabling detailed design drawings and unparalleled information quality.
- **Allplan Engineering Building** – for structural engineers that do not wish to compromise. Models are created quickly and accurately, concrete reinforcement detailed and working drawings generated – all without switching tools.
- **Allplan Engineering Civil** – for civil engineers and structural draftsmen designing bridges and heavy civil projects. Structures with complex geometry can be fully modeled, reinforced, and detailed quickly and efficiently.
- **Allplan Bimplus** – the ultimate open BIM platform for all disciplines to collaborate efficiently in projects. BIM model data, documents, and tasks are managed centrally over the complete building life cycle.

Headquartered in Munich, Germany, ALLPLAN is part of the Nemetschek Group. Around the world over 400 dedicated employees continue to write the ALLPLAN success story.
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