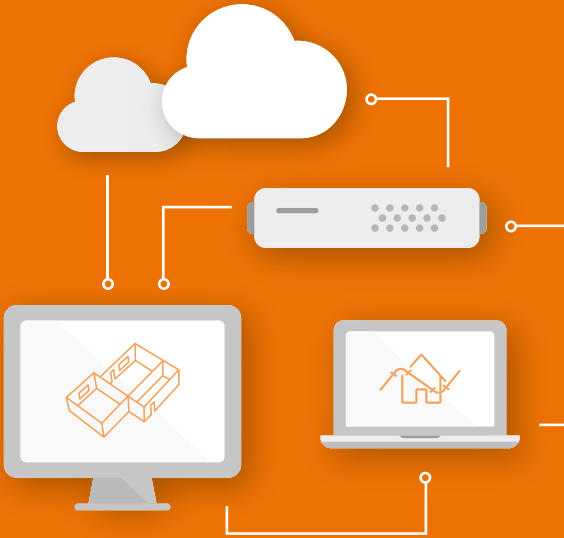


# Why BIM? How Efficiency Can Be Enhanced

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This is the third in a series of 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.

# Why BIM?

## How Efficiency Can Be Enhanced

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

Building Information Modeling (BIM) is becoming adopted across the architecture, engineering, and construction fields. But for many designers, BIM appears to be complex and difficult to implement with unclear benefits. However, as BIM becomes increasingly required by clients, architects and engineers will need to implement new tools and methods in order to stay competitive.



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**1,400**  
ARCHITECTS  
INTERVIEWED

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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 for architects, engineers, and specialist designers.

In addition to the benefits of effective collaboration and smooth data sharing, BIM allows some tasks to be automated or removed from the design process compared to traditional 2D design methods. In a time when budgets and schedules are under pressure and profit margins are shrinking, designers need to exploit every efficiency to successfully deliver projects while remaining profitable. With the right tools, delivering projects becomes more streamlined and frees up resources for other work. In this, the third of our why BIM series, discover how BIM can rationalize your workflows and enhance design efficiency.



### ADVANTAGES FOR ARCHITECTS

#### IMPROVED EFFICIENCY

The advantages of 3D design are undisputed, as shown by the experiences of mechanical engineers and the automotive industry. This is not always obvious at first glance, because many architects only use 3D models for presentations to contractors and investors or as an illustration in architectural competitions. However, these 3D computer-generated models are – in most cases – only assembled 3D objects that have been assigned realistic textures and surfaces. They are used exclusively for the visual presentation and cannot be used as the basis for in-depth design due to the lack of a database. Such animations cannot be compared with real 3D models. A real 3D model is the digital image of the future building and contains all the walls, ceilings, doors, windows, etc. Even in the design phase, they offer many possibilities, such as using virtual reality for building tours or 3D printing.

#### VARIOUS POSSIBILITIES IN VISUALIZATION

Virtual reality offers entirely new possibilities when working with a design. For architects, for example, rooms and their spaces can be experienced in all three dimensions. Textures, colors, and information can be assigned to components, the course of the sun and shadows can be simulated, or interior spaces can be equipped with inventory and the results experienced immediately. In addition, virtual reality

makes it possible for not only architects to experience the 3D model, but the client as well. Dimensions and proportions are spatially easier to comprehend and decisions for or against a design can thus be made faster and much more easily.

### **GREATER EFFICIENCY THROUGH TIME SAVINGS AND ERROR PREVENTION**

The consistent modeling of a building design as a 3D model offers added value. Leading international architectural firms have recognized this. They are already working with computer-generated forms in the earliest digital design models and are using 3D printers to print them as exact physical plastic models. A 3D model can be constantly updated, changed, or extended from the original building design to the working drawings, to the complete building including the room data sheets, to the building services and furnishings, including all specialist designs. All the client's requirements that are the basis for each specialist designer's own services can be recorded in relation to space within the 3D model. What was previously written in paper form in extensive printouts can now be directly recorded in the 3D model in a legally compliant manner.

Plans and quantities are easily updated with the 3D model. This saves time during the project development and provides information instantly to the clients, specialist designers, and construction trades.



## MORE TRANSPARENCY IN DESIGN

A continuous exchange of data between all design partners ensures that every specialist designer is always working with an identical state of planning. This even works across countries and languages. Changes can be shared without losing time. Collisions or spatial problems can easily be visually identified via the 3D model, without creating ceiling designs, sectional views, or detailed drawings. Installation or maintenance scenarios can be verified in any planning phase by using 3D representation. The building design can be evaluated in connection with the construction sequencing and proposed building services. Thus, many errors come to light visually and do not have to be uncovered through detective work and by comparing plans. This makes it easier to check the quality of the work done by specialist designers. The defect-free building promised to the client can be created more efficiently and more quickly due to a higher level of design quality.

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WHITE PAPER

Get to know further advantages in 3D design in our white paper:

## 5 GOOD REASONS WHY ARCHITECTS SHOULD PLAN IN 3D

Construction projects are – by nature – risky. The bespoke nature of each design, site, and construction process means that automating processes is, for the most part, unachievable. However, continued delays and cost overruns do not have to be the norm. The increasing digitalization of design and construction – primarily using 3D modeling and BIM – offers efficient solutions to some of the problems regularly encountered on projects.

## SUMMARY

Architecture is no stranger to 3D modeling. However, many of the 3D models that are created are merely volumetric representations with no data attached, used for visualization only. With BIM, this is changing – 3D models are becoming intelligent, connected databases of project information. Other industries such as mechanical and automotive engineering have demonstrated the significant benefits of using these smart, central models: increased efficiency during planning, fewer errors in both the design and construction, and better-quality buildings. Intelligent 3D modeling and BIM can help you create unlimited creative designs that can be seen and experienced by the entire team, while allowing you to manage and deliver an accurate, reliable, and well-coordinated project. Allplan Architecture is the ultimate BIM solution for architects enabling unlimited creativity combined with efficient project documentation. Produce detailed designs together with unparalleled drawing quality.



**BEST PRACTICE:**  
**THE CIRCLE, ZURICH AIRPORT (ZH),  
 SWITZERLAND**

*Customer: rlc ag, Rheineck*



**ARCHITECTURE**



**180,000**  
 SQUARE METERS  
 OF USABLE SPACE

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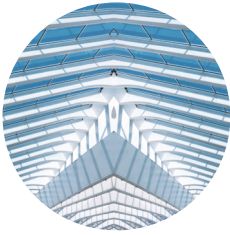
CASE STUDY

The biggest high-rise project in Switzerland is becoming a reality: after six years of intense preparation, the end of April 2015 marked the symbolic green light for the implementation of the major project "The Circle" at Zurich Airport. With a total investment of around CHF 1 billion and within walking distance of the terminal, a high-quality, mixed-use development is emerging, providing 180,000 square meters of usable space. The first and second stages are to be completed at the end of 2018 and in 2019 respectively. In February 2009, Flughafen Zürich AG announced that it was launching the development of a new major project at the airport. At the foot of Butzenbühl Hill, the airport operator has central land reserves with a buildable, crescent-shaped base area of 37,000 square meters, on which a usable floor area of around 200,000 square meters can be built in compliance with zoning regulations. The aim was not to explicitly build another shopping center, but rather to offer a sophisticated mix of hotels, restaurants, headquarters, offices, and event and health facilities.

Learn more about Allplan Architecture in practice:

**BIG, BIGGER, THE CIRCLE**





**ADVANTAGES  
FOR  
ENGINEERS**

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**WHITE PAPER**

## **ENHANCED DESIGN EFFICIENCY**

The automation offered by 3D modeling is a major contributor to increased efficiency. When using a 3D model, creating the large amount of reports, schedules, views, and quantities is no longer a manual exercise. Some previously time-consuming tasks can be automated with 3D modeling software, saving valuable design time. This simplification of processes means that 3D modeling and BIM is useful for any size of project, particularly in the "more for less" climate where programs and budgets are constantly under pressure. Consulting engineers have reported a 30–35% increase in design efficiency by moving to the BIM working method and 3D modeling.

Allplan Engineering Building is the ultimate BIM solution for structural engineers designing buildings from concept to final design. Engineers can create models quickly, detail concrete reinforcement efficiently and generate quality-working drawings in one solution.

Download our white paper to see how other engineers are creating design efficiencies with BIM:

**30–35 PERCENT INCREASED DESIGN  
PRODUCTIVITY USING 3D MODELING**



## STREAMLINED REINFORCEMENT DESIGN

Using 3D modeling software, concrete reinforcement can be designed in a fraction of the time it takes for 2D reinforcement detailing. Reinforcement can be quickly placed within components by specifying either the bar spacing or number of bars. Intelligent modeling software can auto-detect edges of components, automatically stopping reinforcement with the specified amount of cover and bending to fit around edges or other reinforcement. The benefits are even more impressive when modeling complex shapes. Reinforcement can be modeled along a horizontal alignment, even where the cross-section varies, such as in bridges where the center of the span is deeper than the ends. Once the reinforcement has been modeled, bar spacing can be easily adjusted by specifying a new spacing value, and the model will automatically update to reflect the change.

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WHITE PAPER

Download our white paper for further examples of how 3D modeling expedites reinforcement design:

**EFFECTIVE DESIGN: 10 BIM FACTS THAT SUPPORT SUCCESSFUL DELIVERY OF ENGINEERING PROJECTS**

## WORKFLOW OPTIMIZATION OPPORTUNITIES

One of the main benefits of 3D modeling is the ability to streamline existing workflows. Steps that were necessary in 2D processes can be shortened or removed completely. For example, the ability to auto-generate plan, elevation, and section views from the 3D model decreases the time needed to complete these drawings, as only the final layout and scale will need to be adjusted. Where previously there would be a program item for creating bar bending schedules or bills of quantities, these are now produced as a by-product of the 3D model. Even coordination procedures with other team members are affected, as many of the outputs they require are available in the model. This simplification of previous workflows allows projects to be completed more quickly, with more projects completed in the same amount of time or with fewer resources.

## SUMMARY

With budgets and programs being put under increasing pressure yet designs becoming more complex, making a decent profit margin requires more efficient working methods. Using BIM and 3D modeling, time-consuming manual activities can be replaced by automated processes, saving valuable time. Reinforcement design and detailing, in particular, can be accelerated using the latest modeling tools which simplify the process. The time saved for these activities can be used for other tasks, streamlining the design development. And with all the project information contained centrally within the model, communication between teams is more efficient and less prone to errors and discrepancies. Advanced 3D modeling and BIM can help you create accurate, up-to-date, and timely deliverables on your next project, keeping your consultancy profitable and successful.



ENGINEERING

**BEST PRACTICE:**  
**THE QUEENSFERRY CROSSING (SCOTLAND)**

*Customer: Andreas Hartung, head of the reinforcement team for the pylons as a subcontractor for LAP-Consult/Germany*

**ONE OF THE LARGEST INFRASTRUCTURE PROJECTS IN NORTHERN EUROPE**

Transport Scotland's consultants – a Jacobs-Arup joint venture – were not given an easy task in developing a concept for the new bridge. The bridge had to be an equal counterpart to the world-famous and cultural icon of the „Forth Bridge.“ The Queensferry Crossing is the largest bridge for which 3D reinforcement design was created entirely with Allplan Engineering. It was possible to meet deadlines and budgets thanks to an accurate and collision-free design.

„With its 3D reinforcement module, Allplan provided us with excellent support in the construction design so that precise, collision-free reinforcement detailing could be provided at the building site while meeting all delivery deadlines.“ (Andreas Hartung, head of the reinforcement team for the pylons as a subcontractor for LAP-Consult/Germany)

Read more about how Allplan Engineering supported designing the longest three-tower, cable-stayed bridge in the world:

**THREE CENTURIES OF BRIDGE BUILDING OVER THE FIRTH OF FORTH**

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CASE STUDY



## 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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