building the digital

BIM WORLD EVENT

HOW TECHNOLOGY INNOVATIONS CAN IMPROVE THE BUILDING DESIGN PROCESS

e-book edition

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As we step into 2019, it is a good idea to look back and evaluate how much our industry has grown.

In 2018 we have seen technology innovations taking over and transforming the building design process. It is very obvious that the Architecture, Engineering & Construction (AEC) Industry is heading towards a more collaborative approach, while all the innovations are falling under the Building Information Modeling (BIM) umbrella.

The variety of technology innovations are helping project teams to be more productive and work more efficiently during the building design process. They are helping teams to face challenges like project delays, lack of coordination of information, inaccurate project data, miscommunication between project teams, design changes that often result in re-work and adding up costs.

Software and applications related to project management, information or cost management are helping project teams to improve communication and resolve issues early in the process. Equally important, are a lot of applications that are facilitating BIM model coordination for effective clash detection. In addition, other technologies include cloud-based tools, Artificial Intelligence (AI), Internet Of Things (IoT), real-time rendering applications, virtual and augmented reality.

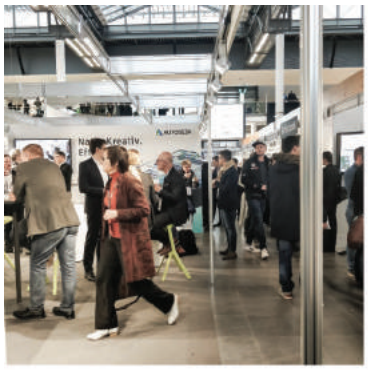
This article will focus on the latest technology innovations that have been highlighted in BIM World Munich (2018), and they are already making a big impact on any project workflow.

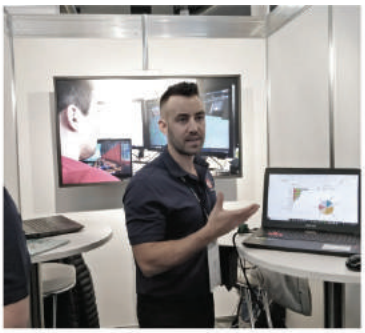
WHAT IS BIM WORLD?

The main aim of the event is to showcase solutions and applications around Building Information Modeling that are changing the way we build the world around us. BIM World is known as: **" The leading event for innovative BIM solutions, construction IT and new IoT technologies for the building industry"**

During the 2-day event at the ICM Munich, professionals from various disciplines are coming together to showcase how the building industry is moving towards digitalisation and process optimisation. Furthermore, exhibitors demonstrate BIM-solutions and applications, speakers make presentations about their work and start-ups pitch their ideas.

In 2019 BIM World will be hosting two more events: in Paris (2 & 3 of April) and in Munich (26 & 27 of November).



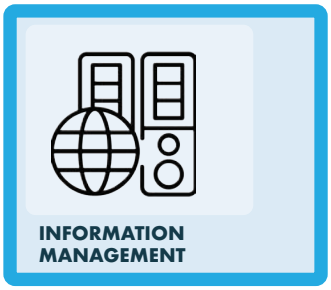


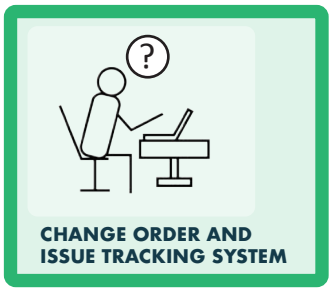
1. PROJECT MANAGEMENT TOOL FOR BETTER COLLABORATION :

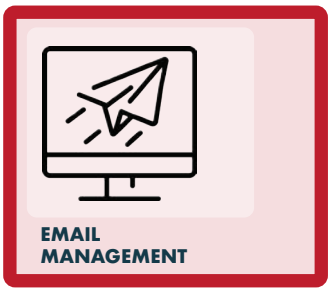
A project management (PM) software is a necessary tool during the building design process. Successful coordination, collaboration and good communication are depended upon a strategic process of planning each phase very carefully. It is almost impossible to track project-related tasks, manage a load of information, estimate and track cost, without such an application.

More specifically, project teams can benefit from the following when using a PM tool:

- All **project Information** and important documents are managed in a central data storage in a cloud-based platform. All data are organised and accessible by the right people at the right moment.
- **Cost management and budgeting:** Monthly and weekly budget reports on expenditures and expenses can help the team keep track of the budget.
- **Real-time communication:** The team can stay up to date during the construction process with what's happening on site at any given time.
- Some PM tools have a **change-order and an issue tracking system** for managing BIM models in real time. In this way, the team can better manage design changes and more efficiently resolve clashes.
- **Email management** by indexing and organising all project emails.







2. CLOUD-BASED PLATFORM FOR MANAGING ALL PROJECT DATA

Design and construction workflows are moving towards digitalisation, therefore cloud-based tools are essential throughout the building design process. They establish a secure and accessible space for all project files, project data and BIM models.

The biggest benefit is the real-time progress documentation of the project. Also the fact that all users have access through the web anytime from anywhere in the world. This kind of service supports real-time communication and collaboration because it is much easier for project participants to share information.

The following companies have developed cloud-based solutions for project management, aiming at facilitating collaboration between project teams:

BIMCollab: Issue management platform

BIM.POINT: BIM data management

Bluebeam: Collaboration software application

Cobuilder: Data management solution

dRofus: Data management and BIM collaboration tool

Elecosoft: Project management solution

Geniebelt: Real-time project management and collaboration platform

Molteo: construction management software for real-time overview of the projects

Neanex: BIM collaboration platform

Newforma: Project email and file management software

Place strategy: Lean construction software

PLANFRED: Document sharing and collaboration platform

Revizto: BIM collaboration issue tracking software

Thinkproject: Common data environment for construction and engineering projects

Mobile solutions for construction: Construction management platform

Oracle Construction & engineering: Information management for large construction project

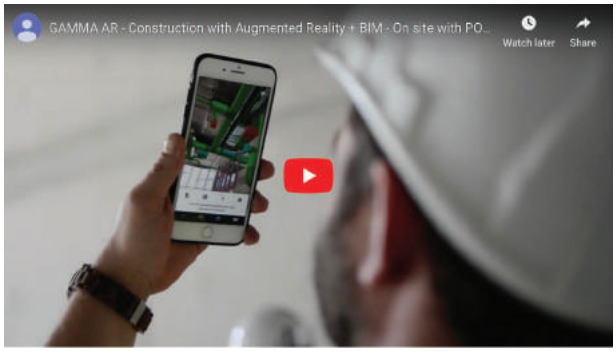
3. VIRTUAL AND AUGMENTED REALITY ARE CREATING A BETTER EXPERIENCE:

The use of Virtual and Augmented reality is already very popular and is expected to grow even more. Clients can have a better experience, walk inside their buildings before they're built and get a sense of scale. They understand the space, the materials, even the light that is coming in. As a result, clients are more engaged during the building design process.

Augmented reality technologies are merging real and virtual life. More Specifically, digital 3D models are visible in the physical world via an app. This kind of technology is taking into consideration the real-world surroundings like an existing site. With the use of an I-pad or a mobile device, you can overlay a 3D proposal of a building.

AR technologies make it possible to monitor progress more efficiently during construction and operation phase. Particularly, with GAMMA AR application users can overlay 3D Building Information Models on Construction sites. This will help them compare the reality with the planning information contained in 3D BIM models. Consequently, project teams can avoid errors during construction progress.

GAMMA AR presented their innovative technology at BIM World Munich 2018. To find out more about them visit their website or click the image below to watch their video:



Other companies that are developing solutions for Virtual and Augmented reality are the following:

BIMobject VR & AR: Collaborate design and edit models using VR, AR and 3D scanning.

ALLVR: Software for visualisation and collaboration purposes with BIM information integrated in VR.

Dalux: BIM model viewer that supports AR with their TwinBIM technology.
raumdichter: Virtual reality application for real estate

Robotic eyes: Creating holograms from 3D models.

Tridify: Importing BIM models and data in Unity Editor to visualise them in VR

VUFRAME: Showcasing products and

4. REAL-TIME RENDERING SOFTWARE FOR VISUALISATION PURPOSES:

Real-time rendering technologies have made their way in the architecture industry. It is now possible to create high-resolution images, animations and real-time walk-throughs in "no time". Architects and designers can take advantage of a real-time rendering application and integrate it within their BIM workflow at any stage of the design. This process is helping project teams to communicate better the design intent with their clients and other project consultants.

Enscape is an example of a real-time application that also supports virtual reality, check out the latest version by clicking the image below to watch their video:

5. BIM LIBRARIES FOR ACCURATE BIM MODELS

With the rise of BIM to be taking over the AEC industry, project teams are always looking to download BIM content to make their virtual building models more accurate. There is a variety of online platforms that are offering BIM objects available for download. Additionally, they are providing a service for manufacturers to host BIM products that contain all necessary information.

Following are a few online BIM libraries:

BIMobject: BIM content platform that allows users to save and organise their favourite products in the cloud

Planone: Real world BIM products by manufacturers

Polantis: BIM library that allows users to compare technical and design properties

BIM&CO: A platform for manufacturers to publish and manage their BIM objects

Prodlib: Product library for Architects, structural engineers and Manufacturers

6. ARTIFICIAL INTELLIGENCE (AI) AND INTERNET OF THINGS (IoT) ARE AUTOMATING PROCESSES

This is the high-tech evolution in construction that supports automation like nothing else. These technologies are quite new in the construction industry, but they are slowly making their entry. I have searched online the term Artificial Intelligence and this is the simplest way that I can explain it:

With Artificial Intelligence, machines (or computers) have the ability to think and perform tasks that would normally require "human" intelligence. AI create systems that simulate "intelligent" processes and has a great impact on the project's team productivity and efficiency.

The use of cameras in construction sites is a very good example of how Artificial Intelligence can understand and analyse real-time activity. This is an intelligent way to track progress, predict errors, delays, potential problems and more.

ABAUT is a company that develops innovative solutions with AI and IOT technologies. They perform Intelligent Data Analysis to automate construction processes with the use of real-time information, AI and sensors.

If you want to learn more about the impact of AI and machine learning in Construction, this video is the best I found on the subject, click the image below to watch it:

7. BIM AND BLOCKCHAIN TO REGULATE THE CONSTRUCTION INDUSTRY

To be honest, this was not a big subject in BIM World Munich. In fact, there was only one presentation at the start-up competition that was all about Blockchain and Building Information Modeling. However, I find blockchain technology very interesting and I believe it will impact the way we perform our contracts. Blockchain technology definitely has a place in the future of the AEC industry because it is a very regulated industry.

Blockchain technology is a decentralised data structure, where information of transactions is recorded and added to a public or private ledger ("chain") with chronological order. These transactions are visible to everyone who participates in a project, the data are never deleted and this makes the whole process more transparent and immutable. Therefore, blockchain technology can streamline and automate project delivery and payments.

BIMchain is a company that is developing an application with blockchain technology and presented their solution at the innovation stage at BIM World Munich 2018. Visit their website to find out more about what they do.

Visit the website for future blog posts like this one. Please feel free to contact us for any comments you have regarding this article, or if you want to make a suggestion about future articles like this one.

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