

# BOUYGUES CONSTRUCTION

## Case Study



Photo © Bouygues Construction

### Challenge

Bouygues Construction is a global leader in sustainable construction. The French company has made a long-term commitment to reinvent the construction industry and make it more efficient and sustainable. It needed a reliable technology partner and industry-leading platform to digitalize its processes, improve knowledge sharing across the value chain, and explore the potential of virtual twins.

### Solution

Bouygues Construction partnered with Dassault Systèmes to drive its digital transformation and improve the productivity of its construction projects. They collaborated to adopt 3D model-based working principles and define every interface among all disciplines from the onset of

each project within a virtual environment, using the *Integrated Built Environment* and *Building Design for Fabrication* industry solutions on the **3DEXPERIENCE** platform on the cloud.

### Benefits

As Bouygues Construction rolls out the **3DEXPERIENCE** platform across its global business, it's benefiting from streamlined decision-making, reduced waste, enhanced quality, and the ability to handle increasingly complex projects. Working within an integrated and collaborative environment with a single source of actionable data, everyone from management to site workers is empowered to communicate more effectively and gain the insights they need to work productively – at every stage of a project.

## RESHAPING TRADITIONAL CONSTRUCTION

In Pantin, a suburb at the gateway of Paris, the local Art Deco Leclerc swimming pool has been transformed into a modern, dual-purpose facility for art and sports. The extensive renovation involved restoring the original swimming pool and constructing a new conservatory, made up of a large auditorium and music room, looking out to a landscaped garden. Construction has been handled by French company Bouygues Construction, a global leader in sustainable construction and specialist in designing, building and operating projects across the building, civil works and energies, and services sectors.

At its core, Pantin combines technical prowess, bold architecture, and high environmental standards. Most remarkably, it has been a critical pilot for Bouygues Construction's wider digital transformation strategy. The company used the **3DEXPERIENCE**® platform to try out new working methods and improve the way all stakeholders in this project collaborated across the value chain.

"Our current ways of working have been unchanged for several years," said Guilhem Bourgoïn, works supervisor at Bouygues Construction and responsible for the Pantin site. "The whole point of the experiment with Pantin was to look at how, through the **3DEXPERIENCE** platform, we could improve the way we traditionally work using paper, wall displays, highlighting, while structuring more efficiently our processes through digitalization."

For the sake of its own business and the future of the industry, Bouygues Construction committed to a radical evolution of its construction approach.

"The construction sector is one of the least digitalized sectors and productivity has stagnated in recent years," said Frédéric Gal, program director of business transformation at Bouygues Construction. "We want to be proactive and deploy digital technology to transform our activity."

Bouygues Construction partnered with Dassault Systèmes with the ambition of building the next generation of solutions that will address the construction industry's key challenges and support customization at scale.

"Our objective is to deliver tailor-made constructions with industrial methods," Gal said. "To achieve this, we're developing the Digital Project Management Platform (PMNP for Plateforme de Management Numérique des Projets) on the **3DEXPERIENCE** platform. PMNP will become the collaborative solution for



The Leclerc swimming pool has been transformed into a modern, dual-purpose facility for art and sports.

managing all projects for all stakeholders. We're working with Dassault Systèmes to see how their knowledge and experience will help us in our transformation."

## SUPPORTING SUSTAINABILITY GOALS

Bouygues Construction is using the **3DEXPERIENCE** platform on the cloud, taking advantage of CATIA, ENOVIA and DELMIA applications, to break down ecosystem silos and develop a project-centric approach. To ensure success, Bouygues Construction and Dassault Systèmes work within a value engagement framework, the consultative approach designed to qualify measurable business values and outcomes together. Their common objective is to transform the entire construction ecosystem, allowing all stakeholders to benefit from virtual twin and collaboration technologies.

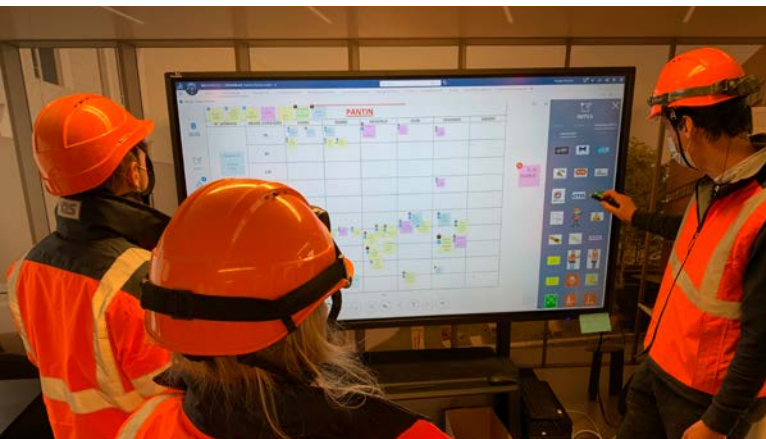
"We will see benefits in terms of health and safety for our workers, because we will enter design phases with much more detailed information," Gal said. "This will allow us to enhance productivity, build faster and with much higher quality. And we will transform the customer experience for the better by meeting their specific needs in a very productive way, while shortening design and construction times and following up with accurate progress reports."

The partnership also plays an integral role in helping Bouygues Construction become an even more socially and environmentally responsible company and tackle four major sustainability challenges: contributing to sustainable regional development;



"Digitalization offers a tremendous opportunity to improve our response to the challenges of sustainable development."

- Marie-Luce Godinot, Deputy CEO,  
Bouygues Construction



Bouygues Construction teams use DELMIA 3DLean on the 3DEXPERIENCE platform to share all information on a large screen in meetings.

creating a low-carbon company culture; digitalizing to support greater productivity; and developing an environment where all talents can flourish.

“Digitalization offers a tremendous opportunity to improve our response to the challenges of sustainable development,” said Marie-Luce Godinot, deputy CEO of Bouygues Construction. “For example, the calculation and optimization of carbon costs, better management of material resources and all this while offering a renewed and enriched relationship with our project stakeholders – suppliers, subcontractors, architects and customers.”

With streamlined processes from design to fabrication and assembly, the company will reduce waste on construction sites and the factory floor. It will also step up the measures it takes to ensure that it is building and renovating responsibly.

“Bouygues Construction has made a commitment to reduce its carbon emissions by 40% by 2030,” Gal said. “The 3DEXPERIENCE platform will help us to meet this objective by making it easier to calculate greenhouse gas emissions. We are in the business of designing low-carbon buildings. The platform will help us a lot in terms of traceability, optimizing materials and enhancing the layouts of different elements to reduce waste, and calculating our climate change impact and improving it.”

## HUMAN AT THE HEART OF A DIGITAL STRATEGY

Bourgoin described a construction site as a great human adventure, adding that while digitalization is the goal, it has been critical throughout that people remain at the heart of this strategic transformation program.

“Every day, many people are working together on site, constantly talking to each other, and managing large flows and volumes of information,” Bourgoin said. “We needed the 3DEXPERIENCE platform to bring a sense of order to our processes.”

To truly understand the challenges Bouygues Construction faces, Dassault Systèmes immersed itself in the daily life of the building firm’s operations.

“Dassault Systèmes listened closely to our needs,” Bourgoin said. “And they took it a step further to understand what we do on a daily basis. The opportunity arose for Dassault Systèmes employees to join us on site for few months. This allowed them

to understand how we work and identify specific use cases to experience the platform. This was a real strength and one of the main reasons why this initiative was such a success.”

Thanks to the 3DEXPERIENCE platform, Bouygues Construction’s workers have been able to embrace new habits and routines.

“The platform was a lever to help us create best practices,” Bourgoin said. “It’s easy to get people on board, to put them in front of the platform, while our previous setup didn’t necessarily allow this.”

In particular, the construction teams have benefited from DELMIA 3DLean on site.

Rather than keeping notes on paper, they can access the online meeting and collaboration app to see the status of all tasks and monitor progress.

“DELMIA 3DLean helps us a great deal in terms of management from a visual perspective,” Bourgoin said. “Previously, we used to stick post-it notes on the walls of our offices. Now, we have all this information stored within the platform and share everything on a large screen in meetings. It means everyone is more engaged and knows exactly what’s going on, helping to easily identify issues and prioritize critical actions.”

“The Dassault Systèmes’ team developed and configured the solution to simplify our processes and facilitate our daily work,” Gal added. “When we asked our workers if they would perform subsequent projects without the 3DEXPERIENCE platform, the answer was unanimous: no way!”

## CONNECTING THE DOTS ON THE CLOUD

By bringing all data and information together in one place with ENOVIA, the 3DEXPERIENCE platform is helping to break down communication barriers, identify potential construction issues and delays, and address them before they become bigger issues on site.

“For example, we’ve improved our delivery schedule by adding useful information into the platform, such as the name of the person in charge of a delivery, the entry points to the site, whether or not a crane is needed, etc.” Bourgoin said. “We didn’t

### About solutions:

*Building Design for Fabrication* enables collaborative engineering empowered by the virtual construction twin, a computational and visual method of addressing issues associated with designing complex projects and systems.

*Integrated Built Environment* enables streamlined collaboration around a built asset throughout its entire lifecycle, with the capacity to incorporate work in various formats making it the unique referential for stakeholders.

### Benefits:

- Collaborate and innovate within an integrated environment
- Manage the full lifecycle of the built asset, increase project control and make informed decisions with real-time project delivery information
- Reduce building design to delivery, construction and lifecycle operational costs while improving design efficiency and reducing waste and rework
- Reuse intellectual property on future projects



With all data centrally stored on the **3DEXPERIENCE** platform, Bouygues Construction can make fast, confident decisions.

have this before, and it could lead to tension or failures because the information was not comprehensive or precise enough. Now, things run much more smoothly.”

The cloud-based platform has been key for supporting collaboration among remote workers, connecting people across the organization, and bringing multidisciplinary teams together within a single environment.

“In the context of the Pantin project, we were able to work easily with teams scattered around the world during a pandemic,” Gal said. “Everyone can connect remotely to the platform from anywhere. It saved them time and kept them focused on their tasks as they no longer need to keep asking questions like ‘Where are you at?’ and ‘Did you do that?’. The **3DEXPERIENCE** platform holds all the information. We also benefit from constant upgrades, knowing we’re working with the most up-to-date version of the solution.”



**“The platform brings together all stakeholders around a single source of truth.”**

- Frédéric Gal, Program Director of Business Transformation, Bouygues Construction

With all data now centrally stored on the **3DEXPERIENCE** platform, Bouygues Construction can make fast, confident decisions with data that is trusted and accurate.

“The platform brings together all stakeholders around a single source of truth,” Gal said. “The data is entered only once and all the actors can access it, easily find the files they need and visualize this data with respect to their specific role in the company. This is extremely valuable to us.”

## FROM BIM TO VIRTUAL TWIN

Instead of digitalizing all its processes straight away, Bouygues Construction adopted a twofold approach with Dassault

Systems. The first step involved deploying project-centric and collaborative working methods. The second step relies on implementing innovative industry practices to reveal productivity gains and address additional complexities brought about by sustainability regulations. This involves taking building information modeling (BIM) a step further using a construction virtual twin approach. It will enable the company to connect program and regulator specifications to the virtual construction twin and virtually test purchasing, logistics and construction assembly. This will drive end-to-end efficiencies across projects.

“The objective of the virtual twin is to deliver on the promise of construction before construction,” Gal said. “It means we can adjust all the irregularities that we imagine and to have a model that is really constructible and to avoid mistakes when we are on site. Once the design is finished and executed, questions are no longer raised about its integrity.”

Bouygues Construction is part way through rolling out the CATIA application on **3DEXPERIENCE** across its teams, targeting 15,000 users. It worked with Dassault Systèmes’ partners Beam3 and Impararia to configure the platform and aggregate all construction knowledge in virtual templates, complete with design, construction and business rules.

The company is benefiting from CATIA’s powerful parametric and modular capabilities and automated product templates to manage complex custom designs. At the same time, it can easily connect with architects’ concept models authored in other design solutions to ensure each project is as unique as it was intended to be.

“By creating business rules within CATIA, we can adapt the configuration to our specific needs, speed up and automate some tasks,” Gal said. “Our objective is to keep our architects at the heart of the project. With CATIA, they can customize our clients’ homes on demand and bring them to life using very productive industrial methods.”

## A LONG-TERM STRATEGY

Ultimately, the **3DEXPERIENCE** platform is helping Bouygues Construction to redefine its future and the modus operandi of the industry. By connecting all stakeholders across the value chain, the company is empowered to take on even more complex and ambitious projects.

“All data related to a construction project, from the design to the execution phase, to the operation and maintenance of the building will be located in the platform, enabling invaluable digital continuity,” Gal said.

The project’s success comes down to Bouygues Construction and Dassault Systèmes’ engagement to making technology work for the people who use it.

“The platform allows us to meet our goals in terms of modernizing the business, while being able to support our clients on projects that are both unique and increasingly complex,” Godinot said. “It’s up to everyone to seize this opportunity, measure the benefits and make this project a success for Bouygues Construction and its customers.”

### **Focus on Bouygues Construction**

A global player in construction with operations in 60 countries, Bouygues Construction designs, builds and operates building, infrastructure and industrial projects. As a responsible and committed leader in sustainable construction, Bouygues Construction sees innovation as its primary source of added value: this is "shared innovation" that benefits its customers while improving its productivity and the working conditions of over 58,700 employees.

**For more information:**

<https://www.bouygues-construction.com>

### **Focus on Beam3**

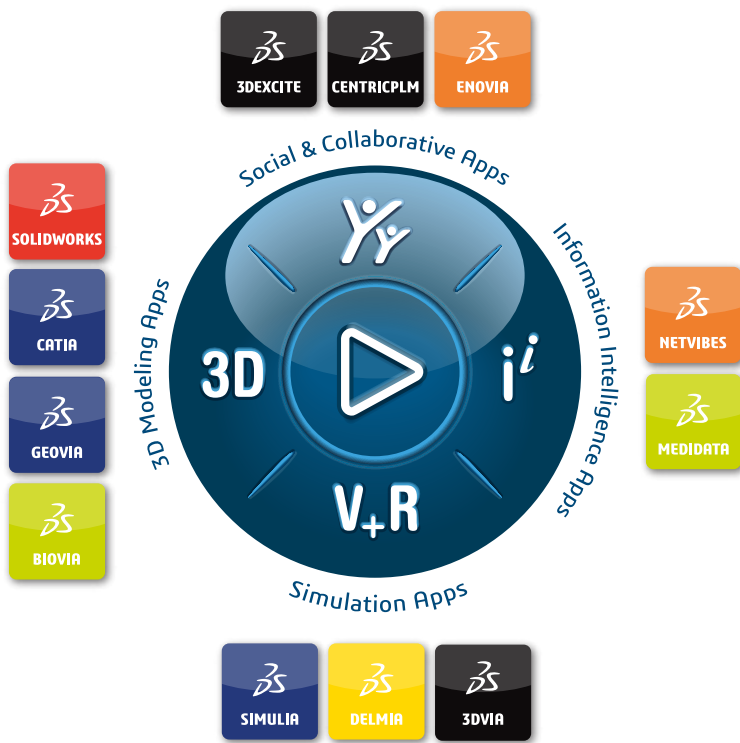
Beam3 brings the best digital project management and design (BIM) tools to the construction industry based on the 3DEXPERIENCE platform. The company provides support and training to companies in the architecture, building and land management sector, helping them to take advantage of the next generation of BIM tools, which it believes are the key to the global progress of the building world and will bring benefit to all. Backed by the 3DEXPERIENCE platform, Beam3 provides its customers with the most efficient approaches that will define the future of buildings and cities.

**For more information:** <https://www.beam3.fr>

### **Focus on Impararia**

With its roots in the aerospace and defense industries, Impararia is a key player in virtual design and construction, building information modeling and product lifecycle management for the architecture, engineering and construction industry. The company delivers innovative business processes and technologies to support companies in overcoming their utmost construction challenges and producing the finest version of their work.

**For more information:** <https://www.impararia.com>



**Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.**

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating ‘virtual experience twins’ of the real world with our 3DEXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes’ 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).

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