

IDeCOM

Case Study

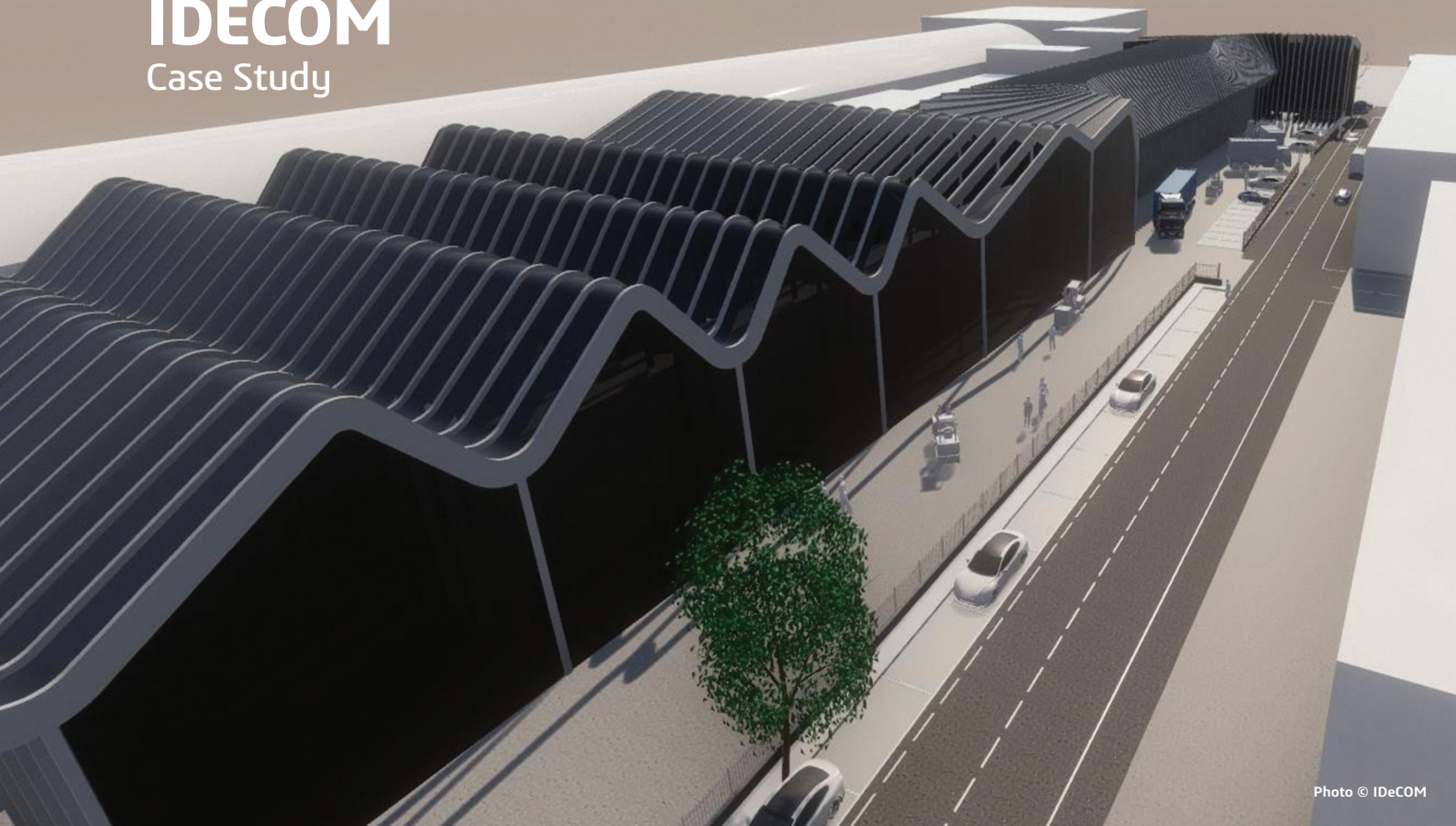


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Challenge

Italian engineering and consultancy firm IDeCOM embraces innovation and creativity to drive positive transformation in the way it delivers civil and structural engineering services to multiple industries across the globe. Serving the oil and gas, and urban infrastructure sectors, the company wanted to bring modern design and engineering approaches to new construction projects.

Solution

IDeCOM implemented the **3DEXPERIENCE** platform on cloud to manage large-scale projects more effectively, as well as acquire new skills and pursue new business models as a platform specialist and reseller. Backed by the *Building Design for Fabrication* industry solution on the

3DEXPERIENCE platform, the company is able to design, engineer and manage complex buildings and infrastructures with high quality and precision.

Benefits

IDeCOM has successfully used the **3DEXPERIENCE** platform in major projects across the globe, including oil and gas, and urban infrastructure. With the platform, it has enhanced its design, simulation and collaboration capabilities, developed virtual twins of buildings and infrastructures for predictive maintenance and embraced BIM. Customers benefit from advanced building lifecycle management, enhanced creativity and greater flexibility to create sophisticated structures that are lighter yet stronger, all while reducing their carbon footprint.



“We’re harnessing the platform and the experiences derived from other industries to develop new, more sustainable fabrication techniques.”

- Andrea Bassani, Co-founder, IDeCOM

MODERNIZING CONSTRUCTION ENGINEERING

When Andrea Bassani co-founded IDeCOM in 2015, he believed the construction, cities and territories industry was ripe for a digital revolution. The Italian engineering and consultancy firm recognized the inherent challenges across the sector as companies continued to construct buildings the same way they had done for decades. But digital transformation is underway, and IDeCOM is at the forefront. It is introducing the industry to the most advanced methodologies and technologies, and shaping a new way of constructing and managing complex buildings and infrastructures.

“One of the main advantages we bring to our customers is an innovative design and simulation process and the ability to manage all disciplines cohesively with building information modeling (BIM),” said Andrea Bassani, founder at IDeCOM. “We think differently.”

In addition to BIM, IDeCOM advocates the benefits of adopting new building and design approaches such as virtual twins. The company has continuously developed its own digital capabilities to bring these innovations to life and relies on industry-leading technology to handle the increasingly complex projects it takes on. Today, the **3DEXPERIENCE**® platform lies at the heart of its digital strategy.

“We wanted to work in a real common data environment and after intense market research on available software for the construction industry, we found that the **3DEXPERIENCE** platform was the only one that delivered the cross-disciplinary functionality we needed,” Bassani said. “It aligns with our vision to drive digital transformation across the industry in the same way that the automotive and aerospace industries have reaped the benefits of process and product innovations on the **3DEXPERIENCE** platform.”

COLLABORATION IN THE CLOUD

From the beginning, IDeCOM sought a cloud-based platform that would enable it to achieve effective global collaboration.

“We needed to find a new way to collaborate both within our company and with external parties to avoid the typical siloed approach that affects the main players in the industry,” Bassani said. “We wanted to help our customers work in a streamlined way where every stakeholder has a clear vision of the entire project. With ENOVIA on the **3DEXPERIENCE** platform, it’s no longer necessary to keep exchanging files back and forth. All information is held in a common data environment in the cloud, so you don’t lose data or introduce errors.”

A cloud implementation made sense for the business and IDeCOM’s customers on many levels. “It was a very light and successful implementation as you don’t need a heavy server structure, which is ideal for small to medium-sized enterprises like us,” Bassani said. “Our first successful collaboration on the **3DEXPERIENCE** platform was with Zaha Hadid Architects when we tested working in a common environment on the cloud and designed together in real time the 3D models. The cloud is totally disrupting the siloed data approach and allowing us to bring all disciplines together.”

DIFFERENTIATION THROUGH NEW CAPABILITIES

As IDeCOM continues to explore the full potential of the **3DEXPERIENCE** platform, it is expanding its capabilities and growing the engineering consultancy and services side of its business. Being able to demonstrate that it is using industry-leading software enhances the company’s reputation and allows it to secure the most complex engineering projects.

“In terms of our design offer, everyone knows that CATIA is one of the strongest pieces of CAD software on the market,” Bassani said. “It gives us the ability to design complex shapes and models with thousands of components – all of which can be managed in the platform.”

Backed by the **3DEXPERIENCE** platform, the company is now able to offer its customers full support in specialist areas such as façade design and construction optimization. It sees the latter as a key area of growth as the company pursues its sustainability objectives related to the United Nation’s Sustainable Development Goal 9 – build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation – and Goal 11 – make cities and human settlements inclusive, safe, resilient and sustainable.

“We didn’t have specific competencies and knowledge in façade design, but we’re very skilled in design optimization and the platform helped us to build on this,” Bassani said. “We’re also harnessing the platform and the experiences derived from other industries to develop new, more sustainable fabrication techniques.”

SIMULATION OF ADDITIVE MANUFACTURING IN CONSTRUCTION

It was at a production facility in Milan, Italy that IDeCOM put its capabilities on simulation of additive manufacturing processes to the test.

“The redesign project coincided with the customer’s implementation of the **3DEXPERIENCE** platform,” Bassani said. “The architectural design of the building’s roof involved complex shapes. We wanted to explore new ways of producing these elements to reduce costs and material consumption in the process. The customer asked us to study the possibility of implementing new fabrication techniques. It was an ideal opportunity.”

IDeCOM defined a workflow of the entire construction process of the facility, from architecture and design to fabrication on the platform.

“We were involved from the beginning in the R&D process, selecting the geometries and proposing different shapes and roof designs,” Bassani said. “We carried out structural analysis to define the most suitable solution in terms of manufacturing and

installation logistics. In the optimization process we simulated the construction of some complex structural roofing elements using a 3D concrete printing approach.”

IDeCOM used SIMULIA on the **3DEXPERIENCE** platform to carry out thermal and mechanical simulation on the 3D models. It then used DELMIA to simulate the behavior of the 3D printing robots and validate the designs.

“It was critical to be able to reproduce as closely as possible the mechanical behavior of the structural elements and we were able to do that with fine precision on the platform,” Bassani said. “Using DELMIA, we simulated the machines’ movements required to follow specific paths.”

The result is a validated workflow on the **3DEXPERIENCE** platform of such an impressive feat of engineering – undulating concrete beams form a complex and imaginative roof structure.

SUPPORTING BUILDINGS ABOVE AN UNDERGROUND RAILWAY

In a major urban area, work is underway on the construction of a new section of underground railway. The large-scale project is particularly complex as it is being managed in phases by different design firms. Some areas involve excavating under existing buildings.

“We’re consulting on one of the more complex aspects of the project, delivering geotechnical design for part of the underground works,” Alessandro Pedretti, senior engineer at IDeCOM said. “When construction started, the site conditions were challenging so we proposed some integrated models, which pulled together data from different design firms. Before, there was a problem with integration, but we managed it all successfully through the platform. We also simulated some critical installation operations.”

IDeCOM used DELMIA to plan and simulate construction sequences. “We were able to identify problems in design reviews,” Pedretti said. “We were also able to anticipate some problems during construction, which we did through the simulation process. For example, we calculated the maximum lengths of steel rebars that we would be able to get on site and fit within this challenging environment. The platform plays a key role in ensuring the success of this complex project.”

INTEGRATED INFRASTRUCTURE DESIGN FOR AN OFFSHORE RIG

One of IDeCOM’s key areas of expertise is in civil and structural engineering for the oil, gas and chemicals industry. During the design stage review for an offshore rig, IDeCOM used the **3DEXPERIENCE** platform to integrate multiple design models and provide a cohesive view of the entire infrastructure.

“When the customer asked for design reviews, there were problems in terms of integrating the structural, architectural, piping and equipment models with their existing tool because of the physical dimension of the infrastructure,” Bassani said. “We proposed using the **3DEXPERIENCE** platform to integrate it all.”

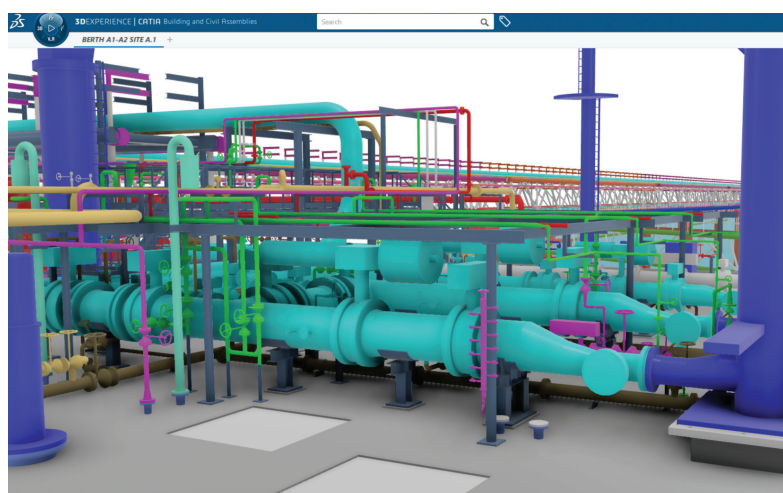
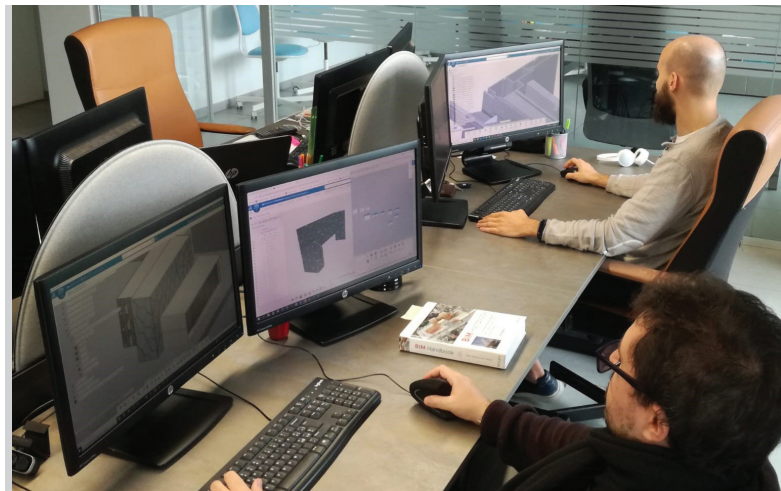
The entire project was managed remotely. “Our customer navigated the 3D models and extracted the required information for design reviews,” Bassani said. “We also used virtual reality tools in the **3DEXPERIENCE** platform, which allowed them to see the infrastructure in the virtual world. They were really

About the solution

Building Design for Fabrication is a solution for innovative and complex architecture employing Design for Manufacture and Assembly (DfMA) methodologies. It provides 3D modeling, architecture design, computational design, structural design, component engineering, model-based system engineering, FEA and CFD simulation, 4D modeling, knowledge-driven automation, change/task/clash management, PLM, portfolio management, and more. Effective collaboration is enabled by digital prototypes, a computational and visual method of addressing problems associated with designing complex projects and systems.

Benefits:

- Reduce construction and lifecycle operational costs
- Optimize design and construction processes and increase project control
- Improve design quality, including building form, function, performance and constructability
- Reduce hours and resources required to design and engineer a project



Top image: IDeCOM’s engineers define the workflow of an entire construction process on the platform.

Bottom image: 3D model showing the structural, architectural piping and equipment components of an offshore rig

Focus on IDeCOM

IDeCOM provides a portfolio of services combining its scientific and engineering capabilities. Its consultancy business vision is to be the partner of choice for high-value services to the civil infrastructures, energy and real estate sectors by delivering innovative solutions with a practical approach.

For more information: www.idecom-eu.com

impressed. The platform enabled us to make it happen; it was ideal for remote collaboration.”

VIRTUAL TWINS TRANSFORM PLANT MAINTENANCE

IDeCOM is increasingly delivering services in support of clients’ virtual twin projects to help them manage their infrastructures more effectively. The company is currently reverse engineering the digital mockup of a chemical plant in Brindisi, Italy using point clouds.

“Our aim is to help optimize plant maintenance,” Bassani said. “We are experts in point clouds and in this case the customer had a large amount for us to manage. Through reverse engineering, we also showed them how to avoid completely re-engineering parts of the plant.”

IDeCOM helped to relate CAD objects to an existing database of information, too. It used the **3DEXPERIENCE** platform’s native Enterprise Knowledge Language (EKL) to speed up the process.

“This was a very complex project, which could not have been done without EKL,” Bassani said. “By adding the coding language based on the object in the CAD environment, we could automate how we related each object to the database.”

The virtual twin project is still in progress, but IDeCOM’s customer is already achieving noticeable advantages.

“We’ve seen a completely different mindset in terms of their data setup and organization, and they’re already benefiting from live virtualization of the plant,” Bassani said.

FROM CUSTOMER TO RESELLER

After a few successful projects, some of IDeCOM’s customers were so impressed with the results that they started to ask IDeCOM to collaborate on the **3DEXPERIENCE** platform and later became users.

“Thanks to their experience with us on the projects delivery, some customer of services became also software customer,” Bassani said. “They bought the **3DEXPERIENCE** platform mainly for the parametric capabilities in CATIA and the ability to develop a common data environment to support new internal workflows and enhance collaboration with external companies.”

It is not often that a Dassault Systèmes customer turns into a **3DEXPERIENCE** platform reseller, but for IDeCOM it was a natural step both in terms of its business evolution and its customer service offering.

“We started with basic 3D CAD skills and moved to data management and simulation,” Bassani said. “As we expanded our capabilities, we received more interest from our customers to use the **3DEXPERIENCE** platform themselves, and we saw an opportunity to sell the platform as an integral part of our offering.

BREAKING DOWN BARRIERS AND DRIVING POSITIVE CHANGE

IDeCOM’s long-term vision is to become a key technology partner in the construction industry.

“Based on our core competencies, we want to implement new ways to approach construction projects,” Bassani said. “We plan to widen our use of the **3DEXPERIENCE** platform and use it as a basis for exploring new areas of design and competencies as we continue to differentiate ourselves in the market.”

Partnering with Dassault Systèmes has been a meeting of two minds as both companies strive to transform the construction, cities and territories industry for the better.

“We share a common vision and are both focused on innovation,” Bassani said. “Our relationship is a great opportunity to realize our vision of changing and trying to bring innovation to the construction industry. That shared goal has been apparent since the very beginning of our partnership. Together, we want to break down barriers.”

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 290,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.



3DEXPERIENCE®