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Sports Stadium Design Gets a Turbo Boost With Digital Technologies

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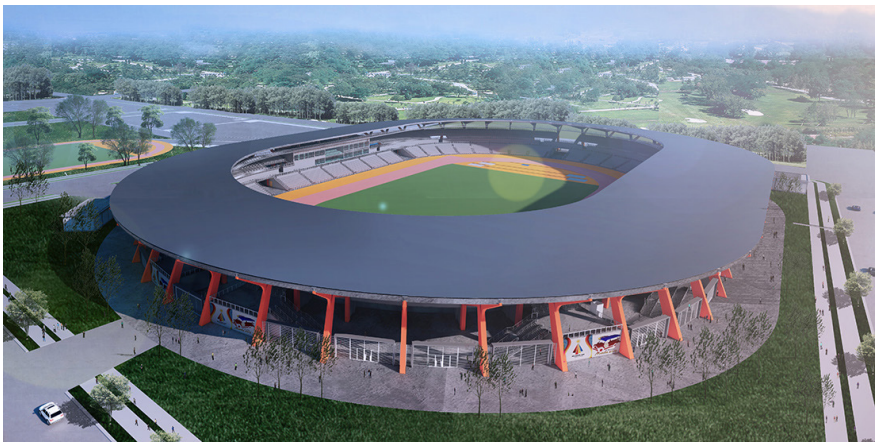
AIDEA TECHNOLOGIES USES BIM TO CREATE A STATE-OF-THE-ART SPORTS STADIUM DESIGN THAT SERVES AS A CENTERPIECE FOR THE 30TH SEA GAMES IN THE PHILIPPINES



The Southeast Asian (SEA) Games is a biennial sports competition in Southeast Asia, bringing together athletes from the region's 11 countries to battle for gold. Member nations take turns hosting, and in 2019, the Philippines was set to host the 30th SEA Games—but needed a new stadium, fast.

For the games, which included 530 events in 56 sports, the country wanted a state-of-the-art sports stadium design that would serve as a centerpiece. Aidea Technologies, a global design firm headquartered in the Philippines, was tasked with implementing the design, building the digital model, and developing the detailed design of the Athletics Stadium and Aquatics Center located in New Clark City in the province of Tarlac, about 80 miles from the country's capital of Manila. The 73,000-square-meter stadium would have a seating capacity of 20,000, a nine-lane 400-meter track-and-field oval, and indoor and outdoor warm-up tracks; the 12,796-square-meter aquatic center houses an Olympic-size pool, training pool, and diving pool and has a capacity of 2,000.

Designing and detailing a stadium are huge undertakings, made even more challenging by a tight timeline. When the Aidea team began tackling the project in 2018, they had only 21 months before the start of the SEA Games at the end of November 2019. Despite the scale and time constraints, the firm was determined to make the project a success for all stakeholders, including concept architect Budji + Royal Architecture + Design, client AlloyMTD Philippines Inc., contractor Hilmarc's Construction Corporation, and owner Bases Conversion and Development Authority.

"We had to deliver because it's not only the firm's pride but also Filipino pride at stake," says Aldwin Beratio, assistant studio head at Aidea. "The Athletics Stadium is a once-in-a-lifetime project for us, so we channeled our athletes' hard work, dedication, and pride for our country to accomplish it."

DESIGN-BUILD COLLABORATION

"For most projects, there's a divide between construction and design, with contractors focused on finishing on time and on budget and designers intent on protecting the integrity of the design," Beratio says. "But for this project, we all shared a

common goal: to deliver a world-class stadium that Filipinos would be proud of."

As a design-build project, collaboration was key to constructing the stadium. The design and construction teams embraced converging ways of working to ensure on-time project delivery. For instance, Aidea had to teach the construction team about BIM (Building Information Modeling), as they were still reliant on CAD. "Helping them understand the technology allowed us to achieve synergy and create a sense of commitment to make the project work," says Ronil Tamaca, operations head at Aidea Technologies.

But working together wasn't easy, with contractors—including main contractor Hilmarc's Construction Corporation—on-site in New Clark City, miles away from the Aidea team in Manila. To bridge this distance, the team turned to technology. "We used emails and videoconferencing to collaborate more efficiently," Beratio says. "The contractor would send us images and videos on a real-time basis so we could address issues in real time, as well."

Maintaining quality amid a quick turnaround time was vital to minimize errors or rework. Aidea's game plan was to anticipate any problems that might occur on-site and resolve them before construction started. The team created an intelligent model of the structure with precise dimensions. Then the team developed simulations to test the model and identify potential issues. "We used BIM to make sure our design was sound, checking all the parameters against how they will be executed," says Mary Anne Nicolas, general manager at Aidea Technologies.

Beratio adds that providing the intelligent model to the construction team let them vet the feasibility of the design. "We were able to adjust accordingly before construction happened and do things right the first time," he says.

The model served as the sole source of truth for design and construction, facilitating fluid collaboration between the two teams. "We were extracting information from a single repository—our BIM model—which ensured everything was up to date and the contractors were getting the latest drawings," Nicolas says. "It gave us a system to coordinate with each other."

A collaborative approach to design and construction proved an effective strategy, and the stadium was completed two months ahead of schedule. "With those two months, we were able to give our Filipino athletes a feel for the play area so they could have a better home-court advantage," Beratio says.

EARLY ADOPTION AND DIGITAL TRANSFORMATION

Aidea was an early adopter of BIM, which paved the way for its success with the Athletics Stadium project. "We made a rapid switch to BIM in 2005," Nicolas says. "This project validated our decision, with BIM helping us standardize our processes, stick to schedules, and inculcate a disciplined approach to project delivery." This decision to embark on a digital transformation journey was prescient, as BIM was only starting to gain traction in the design community at that time.

Digital transformation also worked to Aidea's advantage when the COVID-19 pandemic hit in 2020. "We were fortunate that we created the infrastructure to work remotely before the pandemic came," says Aidea CEO Abelardo "Jojo" Tolentino Jr. "Our transition to BIM was difficult, and we had to learn through trial and error, but being an early adopter gave us time to test our systems and processes and shift our mindset. It provided business continuity in terms of workflow, coordination, and project delivery, and the fact that we were able to put the technology in place ahead of time was affirmation that we did the right thing."

MOVING TOWARD A MORE CONVERGENT FUTURE

Aidea is already applying the lessons learned from the Athletics Stadium to its current projects. "It used to be that we did the designs first, then the BIM models later, so BIM just became an aid during construction," Beratio says. "But now, we're using BIM at the start of the project to aid our designs and make sure they're workable and able to meet costs."

Additionally, a more convergent way of working—similar to what was developed for the sports stadium design project—is on the horizon for the firm. "We're seeing a trend toward integration rather than a linear, disconnected process," Tolentino says. "In the past, the model has always been organic growth, establishing offices in different parts of the world. Now, the model has changed into partnering with like-minded professionals across the globe. Geography is no longer a limitation in an increasingly digital world, and it's exciting to see that future unfold."

About the Author

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About the Article

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