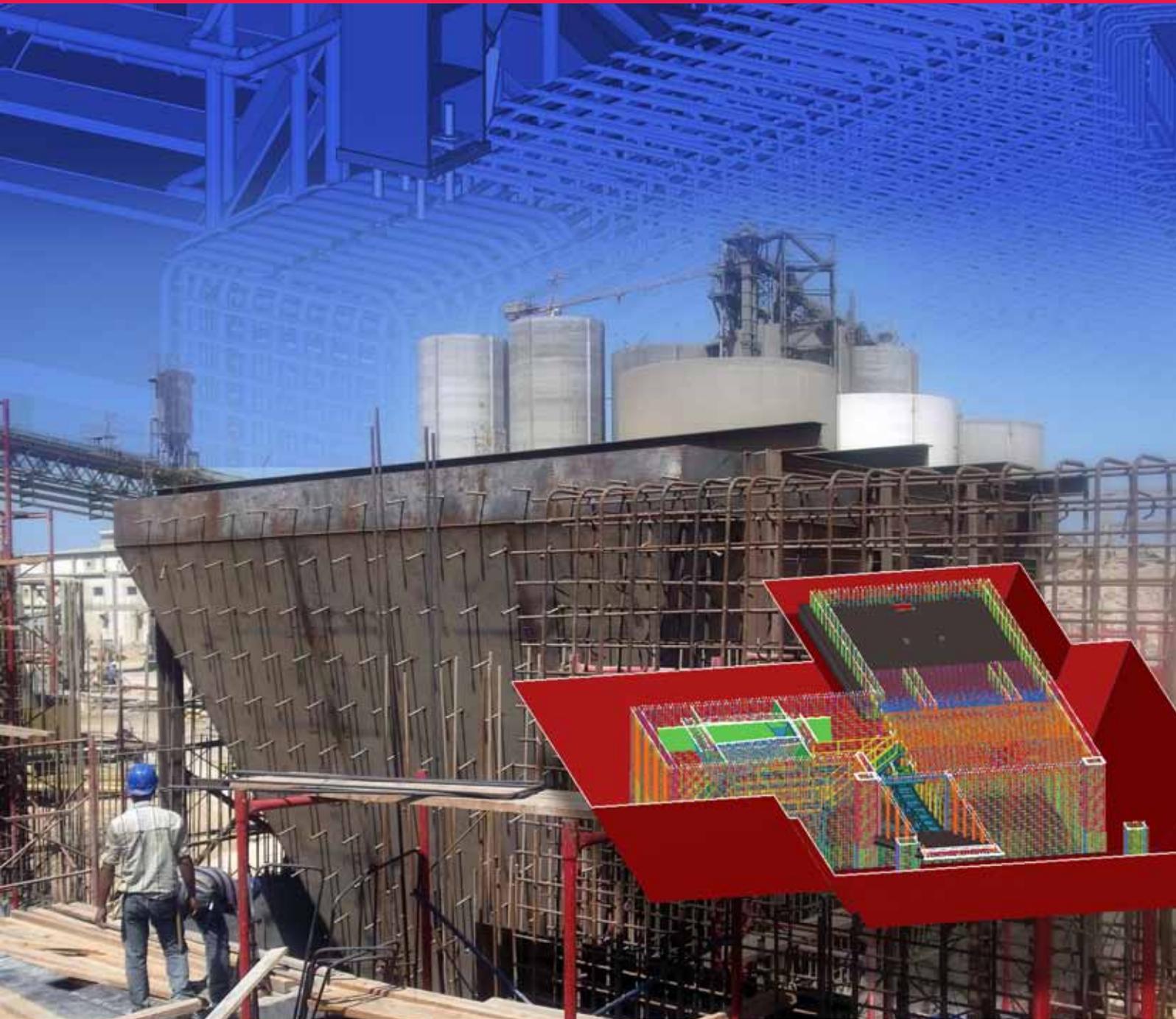




TEKLA SOFTWARE IN PRACTICE
**ENGINEERING &
CONSTRUCTION**

POLYSIUS VIETNAM LTD



TEKLA'S BIM SOFTWARE

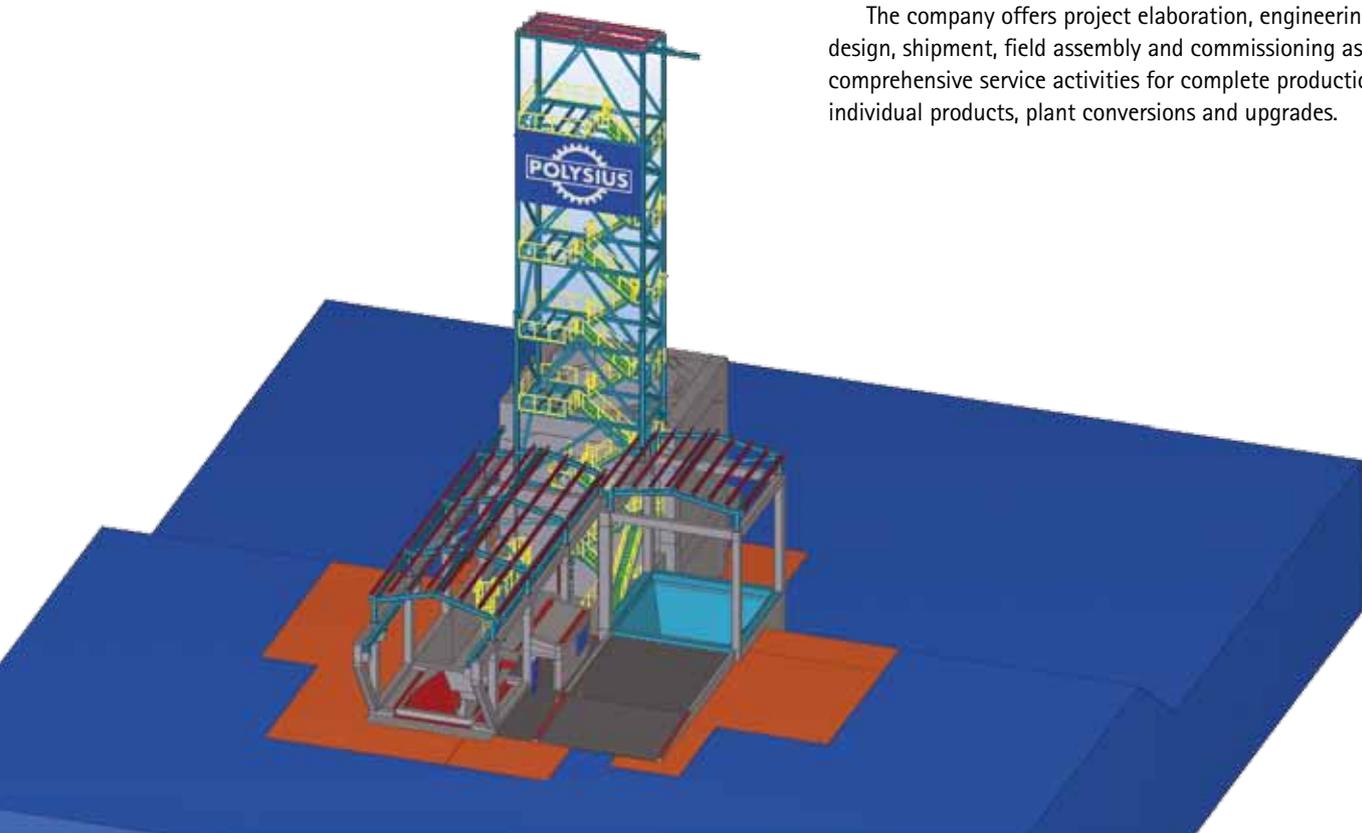
CEMENTS ITS ROLE AS *VITAL ENGINEERING TOOL*

> Armed with Tekla's Building Information Modeling software, the engineering company Polysius Vietnam Ltd. now designs cement plants for the world instead of just Vietnam.

WHAT POLYSIUS DOES

> ThyssenKrupp Polysius AG is a German engineering company that specializes in machinery and plants for making cement and processing mineral ore. Through its Vietnamese subsidiary, ThyssenKrupp Polysius is now leveraging on Tekla BIM to design cement plants around the world.

The company offers project elaboration, engineering and design, shipment, field assembly and commissioning as well as comprehensive service activities for complete production lines, individual products, plant conversions and upgrades.





In November 2011, the Tabuk Cement Company in Saudi Arabia ordered a complete cement grinding plant with a capacity of 180 tons per hour from ThyssenKrupp Polysius.

WHY TEKLA?

> In Vietnam, Polysius had focused on designing and making cement plants around the country and used traditional CAD-CAM software for civil and structural designs. However, in 2009 Polysius Vietnam received a request from headquarters in Germany to produce 3D models for some structures to ease co-operation. As a result, the company began looking for 3D modeling solutions. This would turn it into a player in the global market.

After evaluation, Polysius Vietnam chose Tekla Structures because of its advantages over competing Building Information Modeling solutions, such as ability to combine both concrete and steel structures in one model and its compatibility with PDMS, a 3D software solution for plant engineering.

Polysius purchased its first Tekla license and began training staff. They practiced by modeling buildings and structures of cement plants that the company had previously built. It was only after they became more familiar with the software that Polysius Vietnam realized the potential of Tekla to be a game changer for them.

TEKLA OPENS NEW BUSINESS POSSIBILITIES

> - "At first, our intention was not to use Tekla to actually design a cement plant," says Mr. **Roland Chudalla**, the Deputy General Manager of Polysius Vietnam. "However, as we got used to it, we found it a more efficient way of designing. It also opened new possibilities for us, enabling us to design and build complete, complicated buildings or structures for cement factories."

Armed with Tekla, Polysius Vietnam can now take on new jobs that were previously too complex for them. This means that the company can find new business opportunities around the globe. Thanks to Tekla, Polysius is looking at a better bottom line.

"Tekla also opened new possibilities for us, enabling us to design and build complete, complicated buildings or structures for cement factories."

- Mr Roland Chudalla, Deputy General Manager, Polysius Vietnam.

TABUK CEMENT COMPANY ORDER

> Polysius Vietnam had a good timing. In November 2011, the Tabuk Cement Company in Saudi Arabia ordered a complete cement grinding plant from the parent company ThyssenKrupp Polysius. The order covered all equipment from the clinker feeding system to the cement bag packing plant and bulk loading facility. Polysius Vietnam was assigned to design six of the plant buildings including the main one, the gypsum crusher. The company decided to use Tekla's BIM software for civil and structural engineering work. The plant is scheduled for completion in 2013.

"This was a challenging building to design because half of the building is underground," Mr. Chudalla explains. "The part above ground is made of steel while the underground structure is made of concrete. Another complication was that the structure above ground would be used for housing heavy machinery. It was a very complex building to design."

"Tekla delivers quality, and time and cost savings. In the area of design, Tekla accelerated our work tremendously."

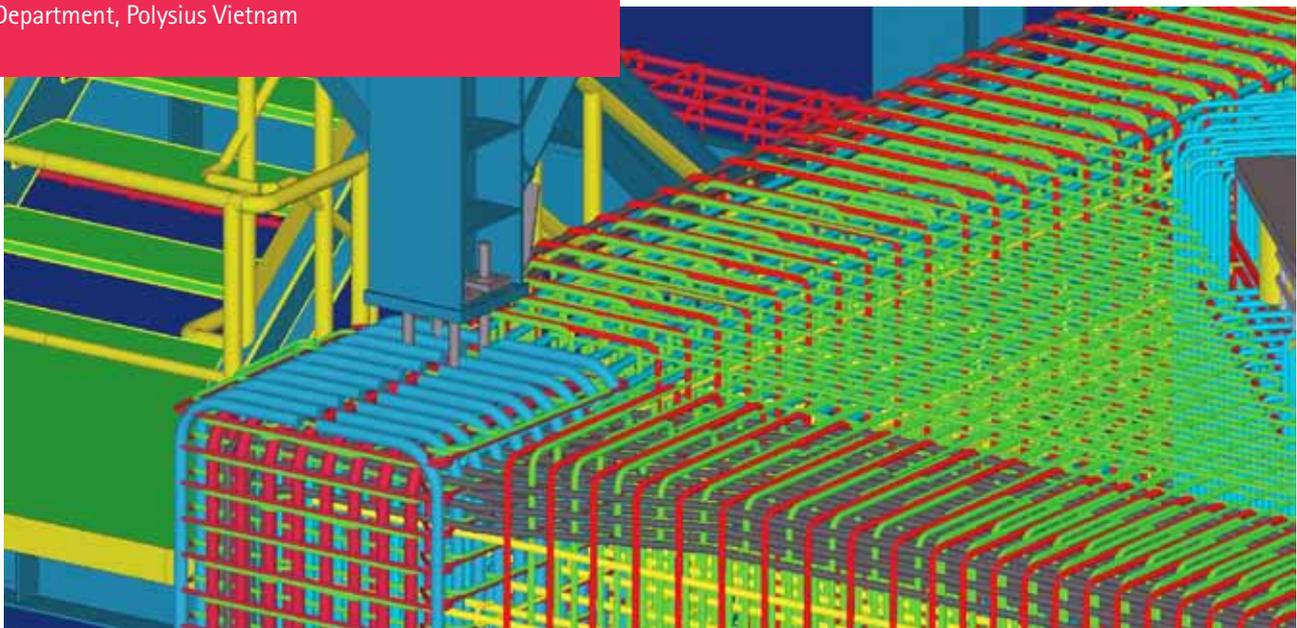
- Mr Nguyen Dinh Quan, Head of the Engineering Department, Polysius Vietnam

PIT, REBAR AND CONCRETE

> Polysius included the excavation pit of the factory to the Tekla model because this allowed them to easily achieve the excavation quantity. As the terrain was quite simple, it could be easily modeled.

Polysius modeled the rebar with Tekla and utilized the information in the model: they issued the detailing drawings and bar bending schedule from the model, but as novice rebar modelers they needed some time for it. However, they already saw that benefits were quite clear. The team was able to foresee and avoid difficulties in rebar installation, and spot clashes between rebar and rebar and cast-in items. They could check if the rebar arrangement was practical and reasonable. The contractor just cut the rebar following Polysius's drawings and installed the rebar on site, without having to ask major questions from the team.

"We felt that, with 3D modeling of the rebar in our office, we don't leave any problem for the site people as we normally did in the past, when the conventional 2D design was applied," says Mr. **Nguyen Dinh Quan**, Head of the Engineering Department of Polysius Vietnam.



Reinforcement and cast-in item details of a beam-column join in the gypsum crusher.

JUST FIVE MONTHS

➤ Even though the complicated Tabuk Cement plant was the first project Polysius designed from scratch with Tekla, they succeeded in completing the work in just five months, thanks to the software. Using Tekla saved time for Polysius as they estimate that with traditional 2D method they would have needed 7-8 months.

According to Mr. Quan, Tekla excelled especially at three things: producing civil and structural steel design drawings, producing correct bills of quantity and most importantly, minimizing the time and manpower needed for the design work.

"Tekla delivers quality and time and cost savings," Mr. Quan says. "In the area of design, Tekla accelerated our work tremendously."

"Tekla reduces the time and manpower required to do the quantity take-off and allows us to come up with bids quickly, accurately and competitively."

- Mr Nguyen Dinh Quan, Head of the Engineering Department, Polysius Vietnam

Polysius Vietnam was assigned to design six of the plant buildings including the main one, the gypsum crusher.



BETTER COMMUNICATION

> Thanks to the Tekla's multi-user function, the design team could work in parallel to build up the 3D model of the factory. Afterwards, the detailed drawings and bills of quantities were quickly generated directly from the model. In addition, Tekla was good in handling changes, which is important in general as every Polysius project involves requests for modifications from customers. With Tekla Structures, the drawings and bills of quantities were updated accordingly as soon as the model was revised.

Another advantage was that models were easier to understand and thus made communication between project parties much easier.

"Model-based communication made things very efficient," Mr. Quan says. "Everybody from clients to different departments and contractors could see what we were talking about."

FEWER DRAWINGS

> Using models also meant that the team had to produce and distribute fewer drawings. This is significant because a complete cement factory could require up to 10,000 drawings and each drawing would have to be checked and approved before being sent to everyone in the team.

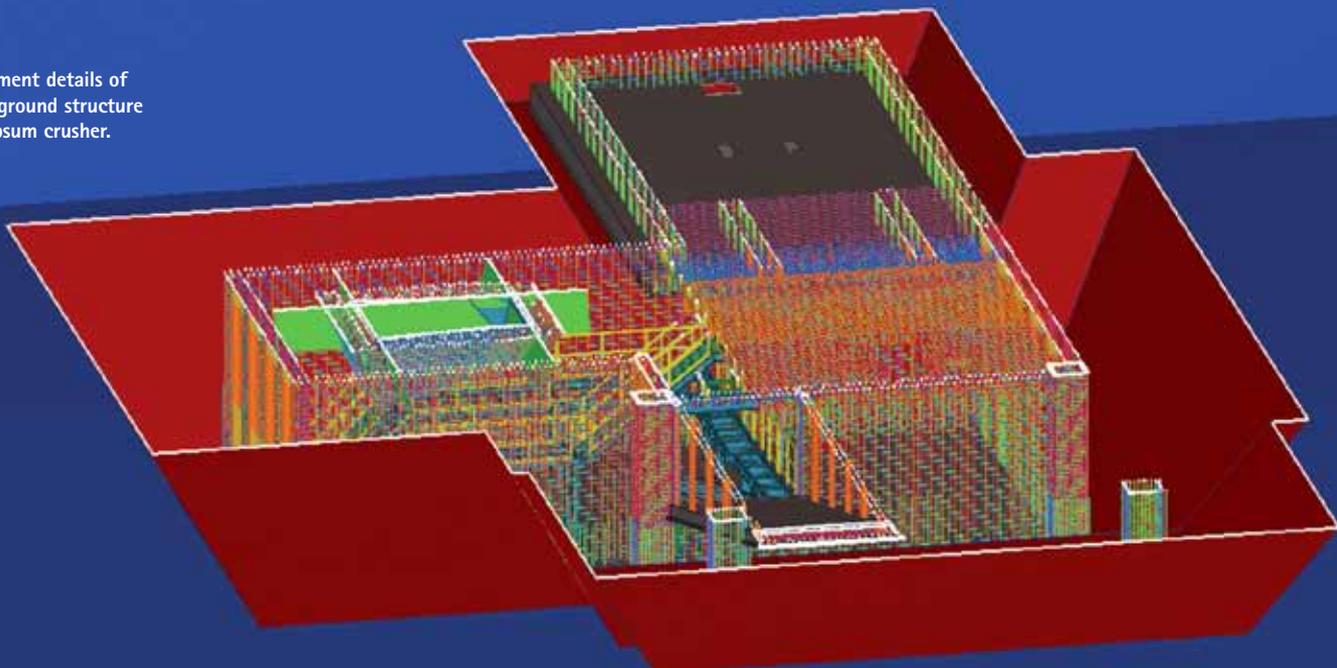
BETTER BIDS WITH QUANTITY TAKE-OFFS

> Apart from using Tekla for structural design, Polysius Vietnam has also found it useful for doing quantity take-offs. Now the company can prepare bids quickly and competitively.

According to Mr. Quan, Tekla allows the company to generate bills of quantity accurately, even on very complicated structures that traditional estimation methods struggle to handle. The software is also useful for controlling budget overruns from project modifications, and Tekla allows fast, easy review of architectural and structural concepts. In Tabuk, the Polysius team used Tekla for material quantity takeoffs and sent the bills of quantities to the contractor on site who used it for ordering the concrete.

"Tekla reduces the time and manpower required to do the quantity take-off and allows us to come up with bids quickly, accurately and competitively," Mr. Quan says.

Reinforcement details of the underground structure of the gypsum crusher.





The gypsum crusher was challenging to design because half of the building is underground. The structure above ground is made of steel while the underground structure is made of concrete.

"We could only have done this job with Tekla. If we had to use a regular CAD-CAM software, we would not have been able to design this within the required time frame and at similar quality at all."

- Mr Roland Chudalla, Deputy General Manager, Polysius Vietnam.



> ThyssenKrupp Polysius, with subsidiary firms on all five continents and more than 2,500 employees all around the world, is one of the leading engineering companies equipping the cement and minerals industries.

ThyssenKrupp Polysius is a strong partner offering project elaboration, engineering and design, shipment, field assembly and commissioning, as well as comprehensive service activities, for complete production lines, individual products, plant conversions and upgrades.

polysius.com



OUR AMBITION IS TO MULTIPLY YOUR POTENTIAL TO THINK AND ACHIEVE BIG

> Tekla's goal is simple: multiply our customers' potential to think and achieve big. Tekla provides a BIM (Building Information Modeling) software environment that contractors, structural engineers and detailers and fabricators of all materials can share.

Tekla software creates, combines and distributes highly detailed, constructable 3D models. Information-rich models lead the way for production control and more collaborative and integrated project management and delivery. This translates into increased productivity and elimination of waste, thus making construction and buildings more sustainable and your ability to achieve big more realistic.

> Tekla drives the evolution of digital information models and provides competitive advantage to the construction and infrastructure industry. Tekla software is used to model all types of structures of all materials.

TEKLA AND TRIMBLE

> Tekla was established in 1966, and today has customers in 100 countries, offices in 15 countries, and a global partner network. Since 2011, Tekla has been a part of the Trimble Buildings Group.

Trimble Buildings Group's solutions tightly link office-based process and information with the field crew. Trimble Design-Build-Operate platform responds to the needs of owners and the AECO industry by increasing productivity and reducing rework.

Visit tekla.com



TEKLA BIMSIGHT

> Tekla BIMSight is a free professional tool for construction project collaboration. Anyone can combine models, check for clashes and share information using the same easy-to-use 3D environment. With Tekla BIMSight project participants can identify and solve issues already in the design phase.