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SIEMENS DIGITAL INDUSTRIES SOFTWARE

Propelling change in ship design and engineering

Use the power of digitalization to boost innovation with Integrated Ship Design and Engineering
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Industry megatrends

Navigating through troubled waters is part of our expertise, but there is no denying that the past few years have been challenging. To stay ahead, shipbuilders must learn to navigate the shifting currents caused by the following three industry megatrends.

The first trend is increased focus on sustainability. For this, it is critical to optimize every aspect of ship performance, as well as explore new propulsion systems, for example electric vessels, and energy sources, such as methanol, ammonia, and hydrogen.

In addition, volatility in the global economy is causing much uncertainty in the shipbuilding market. At the same time, consolidation of major shipyards can be a hit on smaller shipyards which need to compete even harder for their part of the global order book. To remain in the game, shipyards must be able to develop vessels with a low total cost of ownership and high operational availability.

Finally, there is an increasing demand for high value-added vessels, multi-role or multi-purpose vessels, especially in the naval, mega yachts and offshore markets, and a growing interest in autonomous shipping in the commercial and naval sectors. As more high-tech equipment and systems are added onboard a vessel, more parties, including suppliers and co-makers, are involved in its design process. This results in large volumes of data that need to be managed and shared appropriately between all relevant stakeholders.

The complexity resulting from the combination of these trends is unprecedented. But so are the possibilities brought by digital technologies.

Trend #1

Focus on sustainability.

Trend #2

Volatility in the global economy.

Trend #3

Demand for high-tech and versatile vessel.

Turning complexity into a competitive advantage

How can ship designers capitalize on those market shifts?

Leverage software technology to support innovation in the design and engineering of future vessels:

- For example, simulation can be used to optimize fuel efficiency (and therefore reduce emissions) early in the design process.

Maintain consistency of data during design and engineering:

- Align design data to facilitate and optimize the end-to-end shipbuilding process.
- Enable globally distributed design teams to work with a common set of tools.

Connect design processes to construction and operations:

- Improve current and future designs by feeding manufacturing and ship operations data back to the design team.

Build the capability to design ships which are electric and connected:

- Adopt tools for end-to-end electrical design process coverage, from schematics to service.
- Have digitally connected systems in place to support onboard operations and system monitoring.

Improve collaboration and information management:

- Enable various design teams – whether systems, mechanical, electrical and software – to work collaboratively across domains.
- Adequately manage configuration, requirement, change and verification.

Our solution: Integrated Ship Design and Engineering

Siemens Integrated Ship Design and Engineering is a fully integrated solution that enables seamless process execution from initial design to detailed and production design. It enables ship designers to reduce costs, time-to-market and risks by breaking down traditional disciplinary silos.

It is based on the following key elements:

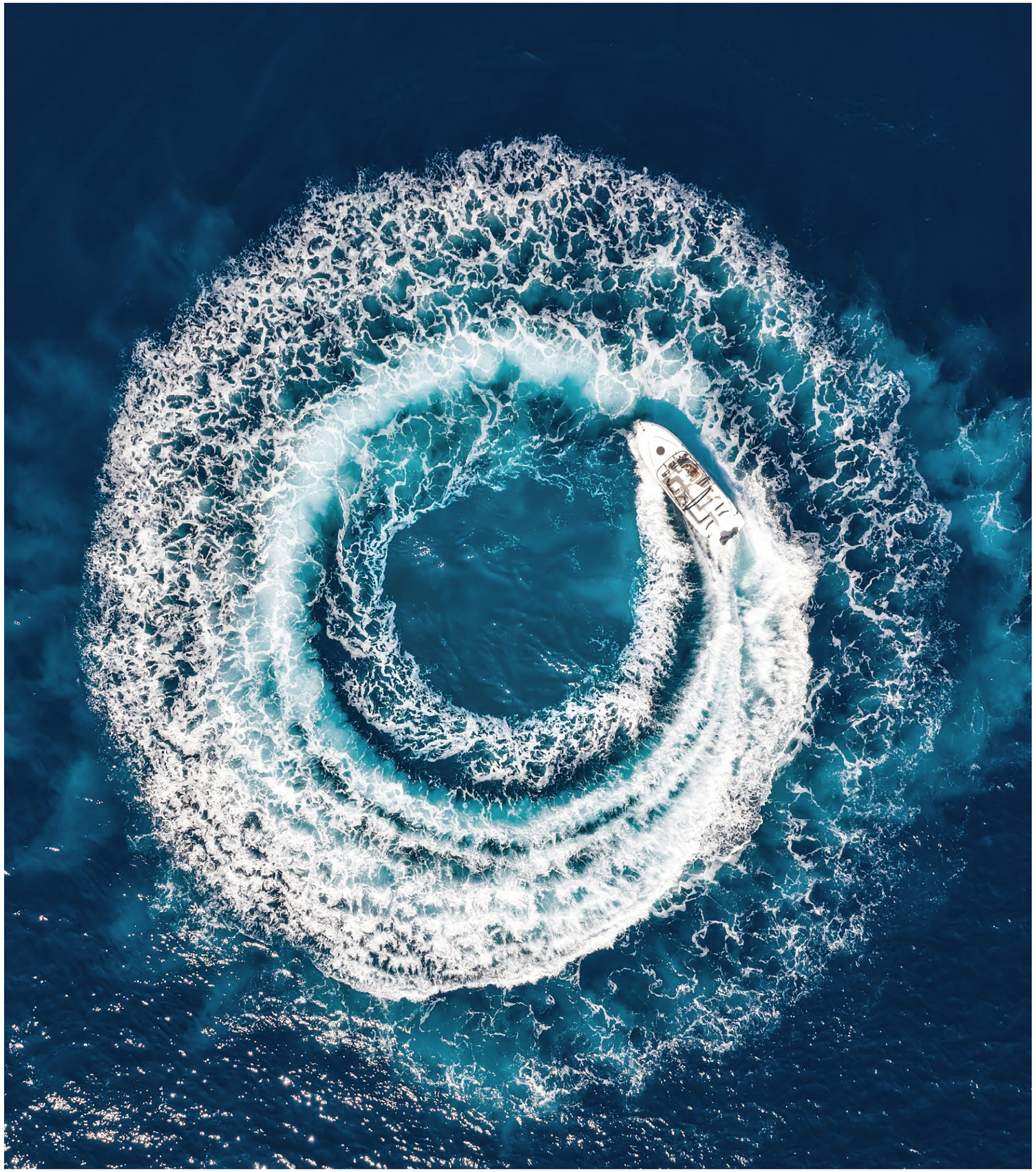
- Multi-disciplinary design: Managing the mechanical, electrical and software features of the product in one single collaborative environment with a comprehensive digital twin.
- Simulation-driven ship design: Understanding, exploring and optimizing any aspect of ship performance, from individual components to the full ship system, with simulation.
- Process orchestration: Increasing process efficiency and improving business agility with seamless process execution and fully integrated solutions.

The design and engineering phase

Represents
5-10%
of overall production costs

Impacts
~85%
of total construction costs

Determines
~90%
of total construction costs



Boost innovation, reduce costs, manage complexity and increase efficiency in your current ship design process with Siemens Integrated Ship Design and Engineering.

Benefits

- Accelerate innovation and optimize new designs to comply with strict environmental regulations.
- Reduce delivery times and lifecycle costs to remain competitive in a tough market.
- Manage and mitigate the risks associated with designing more complex vessels.
- Minimize design iteration loops and break free from the design spiral with a fully integrated solution.

What our customers say

Wärtsilä used intelligent design exploration to meet ambitious design targets while complying with strict regulatory requirements.

We optimized the hull form to meet our customer's challenging design criteria. We could quickly and efficiently try out multiple hull and propulsion design ideas.

Inge Skaar, Director, Project Development and Naval Architecture, Wärtsilä

When designing the Princess Yacht R35, BAR Technologies achieved a reduction of up to 30% in fuel consumption at cruising speeds.

We were able to accurately predict and interrogate the performance of millions of potential hull forms extremely quickly.

Paul Gliddon, Naval Architect, BAR Technologies

Newport News estimated that creating an integrated digital shipbuilding environment could generate more than 15% cost savings.

The next evolution revolves around a digital ship, which really means, for us, a drawing-less ship. The fact that you can have a very pointed piece of data – a video, a digital image – changes the dynamics of how ships are built.

David Delvecchio, IT Director, Business Technology & Transformation, Newport News

About Siemens Digital Industries Software:

Siemens Digital Industries Software, a business unit of Siemens Digital Industries, is a leading global provider of software solutions to drive the digital transformation of industry, creating new opportunities for manufacturers to realize innovation.

With headquarters in Plano, Texas, and more than 140,000 customers worldwide, Siemens Digital Industries Software works with companies of all sizes to transform the way ideas come to life, the way products are realized, and the way products and assets in operation are used and understood.

For more information on Siemens Autonomous Vehicle Development, visit siemens.com/isde or follow us on LinkedIn and Twitter.

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