MARINE & OFFSHORE

HOW TO OPTIMIZE BOAT-BUILDING PROCESSES IN FOUR STEPS

Unlock the benefits of an all-in-one solution that speeds up the development, production and manufacturing of yachts and leisure boats.

DASSAULT SYSTEMES

The boat-building industry is undergoing transformative changes driven by growing market demands, with an expected compound annual growth rate of 6.5% by 2028 (source: MarketsandMarkets). This leads to a pressing need for yacht and boat builders to keep pace with market demands and trends by rapidly introducing new models.

Evolving customer expectations for performance and functionality have resulted in a push to integrate advanced systems into boat designs. Boat builders can effectively address consumer preferences by offering a high level of configurability while addressing competitive pricing pressures and market volatility at the same time.

In light of these challenges, yacht and boat builders face the daunting task of developing more models within a shorter timeframe with the same resources. This necessitates speeding up the design and manufacturing processes, ensuring these new models incorporate cutting-edge technology without compromising performance.

The industry must also remain agile to scale its workforce and operational costs according to market dynamics, enabling it to respond effectively to fluctuations in demand and market conditions.

In this ebook, we will explore the four steps that can optimize boat-building processes — and look at an all-in-one solution for yacht and boat builders powered by the **3D**EXPERIENCE® platform from Dassault Systèmes.

THE FOUR STEPS TO OPTIMIZE BOAT-BUILDING PROCESSES

STEP 01

ADOPT A SINGLE SOURCE OF TRUTH TO MAXIMIZE COLLABORATION

STEP 02

PERFORM MODELING AND SIMULATION DURING THE ENTIRE DESIGN PROCESS

STEP 03

EFFICIENTLY MANAGE PRODUCT OPTIONS TO GAIN AGILITY

STEP 04

DESIGN FOR MANUFACTURING ABILITY TO REDUCE COST

STEP 01

ADOPT A SINGLE SOURCE OF TRUTH TO MAXIMIZE COLLABORATION

The design and building of yachts and leisure boats cut across many disciplines (hull modeling, piping, HVAC, electrical and interior design) and phases (concept design, engineering design, simulation and manufacturing).

To be as efficient as possible and ensure a high-quality product, all product information from these disciplines and phases must be managed within one data model. This single source of truth within a unified data model will allow yacht and boat builders to easily leverage information across the entire ecosystem.

With a model-based approach, builders have **one digital model across disciplines to** support concurrent engineering and project phases. This model-based methodology ensures the digital continuity of a product, maximizing traceability and consistency from design to manufacturing. Teams will no longer need to work in silos and collaboration across the various disciplines can be greatly improved.

> “Because we are all working in the same virtual environment, we can work collectively to solve issues.”
>
> **Eric SEGERLIND**
> Head of In-House Design and Development,
> Hallberg-Rassy

STEP 02

PERFORM MODELING AND SIMULATION DURING THE ENTIRE DESIGN PROCESS

Integrating simulation throughout the entire boat design process offers significant advantages for yacht and boat builders. By incorporating modeling and simulation in the early design stages, boat builders can avoid costly changes later in production. This approach enables the creation of resilient yachts and boats capable of withstanding harsh sea conditions.

Early system multi-physic simulations computed on top of the design model will ensure consistency with requirements. With a unified digital model, boat builders can detect errors earlier, swiftly validate designs (structure, fluids and kinematics) and avoid file exchanges between separate software tools. This approach enables quick improvements and evaluation of alternate designs and trade-offs based on performance criteria.

The **3DEXPERIENCE** platform enables this integration by offering a unified environment for modeling and simulation. This accelerates design exploration, optimization and validation to improve efficiency, achieve weight reduction and reduce the cost of capital expenditures (Capex)

> “The switch is seamless – in just a click of the mouse, you can change from parts to surfaces, to drawings to simulations.”
>
> **Patrik WIKSTRÖM**
> In-House Engineer, Hallberg-Rassy

STEP 03

EFFICIENTLY MANAGE PRODUCT OPTIONS TO GAIN AGILITY

To gain agility, yacht and boat builders must maximize reuse and avoid duplication of design and production efforts. Therefore, it is essential to **develop product configuration options efficiently and easily**. This will allow designers to design within a pre-configured context and visualize the product in 3D as it is being configured.

The key to better managing options and variants is to develop within a single collaborative platform that natively integrates configuration and product lifecycle management (PLM). This will allow builders to reduce costs and improve customer satisfaction with their products, leading to a quicker evolution of product lines.

CONDUCT IMPACT ANALYSIS OF CHANGE REQUESTS

There are numerous change requests throughout the lifecycle of a boat design; some due to the customer and some due to the concurrent engineering between all disciplines. These change requests can consume a significant amount of time and resources. Conducting an impact analysis will allow yacht and boat builders to define how best to approach the design change – or even potentially reject the request.

The impact analysis will ensure that only necessary design changes are approved and only appropriate design objects and requirements are updated. This will help ensure the overall efficiency of the change process, reduce rework and reduce the overall cost of the change process.

> “The virtual twin allows all relevant stakeholders to access the current model in real time and focus on the part or the system that interests them.”
>
> **Thomas NORMAND**
> CEO, MerConcept

STEP 04

DESIGN FOR MANUFACTURING ABILITY TO REDUCE COST

Many decisions that increase manufacturing costs are made during the design phase, often early in the basic design of the ship. Having digital continuity between the engineering and manufacturing phases will enable the seamless and **automatic creation of the manufacturing bill of materials (BOM)**, the manufacturing detailed information and the process plans. These include defining the work instructions, the manufacturing sequences and the resources needed to perform the manufacturing process.

With an all-in-one collaborative platform, yacht and boat builders can simulate the process plan to select the best assembly sequences and propagate any late change from the engineering BOM. This allows them to validate each step of the process plan before execution and ensure that products are built right the first time.

> To stay ahead of the competition and succeed in moving fast enough to meet customer demands, boat builders need take advantage of the digital continuity to perfectly link design and manufacturing processes.
>
> **Antoine MANAC'H**
> Marine & Offshore Solution Leader,
> Dassault Systèmes

ELEVATE BOAT BUILDING THROUGH AN EFFECTIVE COLLABORATION PLATFORM

Based on the 3DEXPERIENCE platform, Sea Boat Builder delivers an all-in-one, cloud-based solution that allows yacht and boat builders to cover their entire development process in a single collaborative environment.

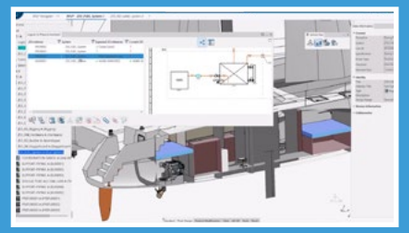
Builders can collaborate with their partners, contractors and customers by sharing a single source of trusted information that is up-to-date and accurate while maintaining IP protection.

Sea Boat Builder allows builders to accelerate the concept-to-manufacturing timeline, collaborate more inclusively and design better products. The solution enables seamless digital design and engineering across all domains, providing complete lifecycle management and full traceability.

- Fully integrated solution (PLM, CAD, manufacturing, project management and business) for dedicated yacht and boat builders.
- Easy to install and operate, deploys quickly and requires low IT investment.
- Ease of collaboration with partners, contractors and customers.
- Strong agility for companies; simple and quick to address new projects.
- Scalable to support the needs, requirements and levels of sophistication of yachts and boat builders that may increase over time.

SEA BOAT BUILDER: AN ALL-IN-ONE COLLABORATIVE SOLUTION

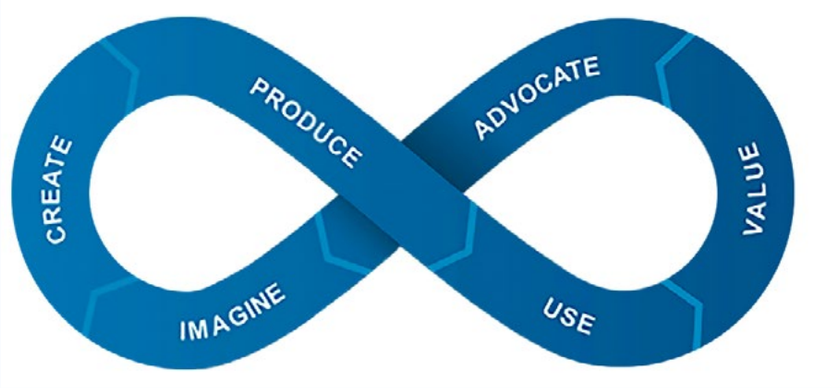
DESIGN AND ENGINEERING



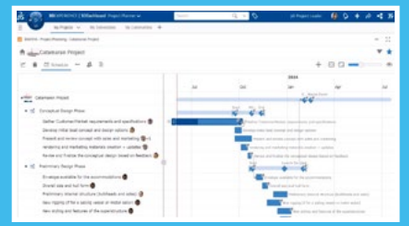
Sea Boat Builder offers a holistic approach to the entire design process, from conception to production. By seamlessly integrating advanced modeling, simulation, composite design, systems design and interior design capabilities, Sea Boat Builder empowers designers to create high-performance, aesthetically pleasing boats efficiently and effectively.

MARKETING

Sea Boat Builder enables builders to generate high-quality static and interactive marketing content that drives their communication and sales activities more efficiently across multiple channels (whether physical or online). Marketing and sales teams can create photo-realistic images, renderings and videos directly from the design data.

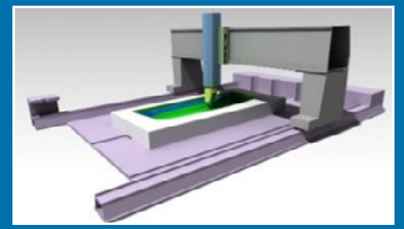


GOVERNANCE



Sea Boat Builder offers integrated project planning and product management tools for efficient collaboration, real-time progress tracking and customer requirement management. These tools deliver enhanced efficiency, quality and customer satisfaction throughout the boat-building process.

MANUFACTURING



The manufacturing solution within Sea Boat Builder streamlines boat production by enabling detailed process planning, feasibility studies and documentation within a 3D environment. It ensures the traceability of materials and components, integrates safety regulations into instructions, and allows virtual assembly simulations to anticipate issues and optimize scheduling.

CONCLUSION

In today's dynamic boat-building industry, growing market demands require innovative and agile approaches from design to manufacturing. By embracing the collaborative **3D**EXPERIENCE platform, yacht and boat builders can significantly improve design, engineering, manufacturing and customer satisfaction.

By adopting a single source of truth, builders can streamline communication and reduce errors resulting in smoother manufacturing and increased productivity. Efficient product options management and design for manufacturing and serviceability significantly cut costs and improve agility. This allows them to meet customer needs, stay ahead of market trends with configurable, high-quality products, and successfully deliver exceptional boats.

Accelerate innovation in boat building with an all-in-one collaborative platform. Contact us to get started.

> "I'd go as far as to say we are working 50% better with the virtual twin as we don't have to create a physical mock-up. It also means our approach is more sustainable since we are not wasting materials."
>
> **Eric SEGERLIND**
> Head of In-House Design and Development,
> Hallberg-Rassy

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