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BLOM Maritime
Marine | Offshore | Power

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DIGITAL TWIN CONCEPT



The Digital Twin concept has evolved to one of the big IT buzzwords in the engineering world, including the maritime industry. At the core of any Digital Twin there is a 3D geometrical representation, which then opens the door for numerous applications in simulating physical behaviour and Virtual Reality interaction.

01



OUR APPROACH

Blom Maritime is a part of the TECO Maritime Group, with focus on marine engineering and naval architecture. Our team consists of project managers, naval architects, piping engineers, structural engineers, surveyors and data analysts, as needed to support our multidisciplinary projects. We specialize in capturing and optimizing “as-is” data for improved engineering and project execution.



02

APPLICATIONS

The high-resolution 3D scan results in a point cloud that can be integrated in CAD and VR (Virtual reality) software for a multitude of industry applications.

AVEVA™

Bentley®
Advancing Infrastructure

ANSYS®

SSI®

Rhinoceros

AUTODESK

Leica
Geosystems

03

3D LASER SCANNING

A detailed 3D point cloud visualization of a large, multi-story building structure. The model shows the complex geometry of the building, including its facade, windows, and internal framework. The point cloud is rendered in a dark, textured style, with some areas highlighted in red and blue to indicate different levels or sections. The background is black, making the point cloud stand out.

- Retrofit surveys
- 3D laser scanning
- Virtual representation
- Cloud data with an accuracy of ± 2 mm is achieved
- No interruption to the assets' operations, while scanning

04

A detailed 3D CAD rendering of a ship's engine room. The scene is filled with a complex network of green pipes of various diameters, some running horizontally and others vertically. Large yellow cylindrical components, likely part of the propulsion system, are visible in the foreground and background. The background shows the structural elements of the ship's hull, including bulkheads and support beams. The lighting is bright, highlighting the metallic surfaces.

CONCEPTUAL DESIGN

- Conceptual design
- Virtual merging existing systems with new design
- Alternative solutions discussed
- Multiple systems could be modelled to verify their suitability on board
- Conceptual design freeze

05

A detailed 3D CAD model of an offshore oil platform. The model shows the platform's deck, various structures, and a complex network of pipes and vessels. A large, brown, cylindrical vessel is highlighted in the center. The platform is shown from a perspective view, with a dark blue background.

DETAIL DESIGN

- Multi-disciplinary concurrent engineering
- Pipe, Structure and electrical design
- ISO and Updated CAD drawings
- Flow/Stress calculations
- Drawings & documents
- Design validation

06

CLASS APPROVAL



- All deliverables submitted to class authorities
- Criteria of class rules are followed while design
- Our deliverables are standardized to match class requirements
- Minimal changes to deliverables after class comments
- Class comments are addressed diligently
- Smooth class approval process
- Class approval process will go on till installation and commissioning phase

07

EN - FR - DE - JP - ES - SE

Appearance

Tools

Navigation

Navigation options

Back to overview

Speed: 21.5

Measurements

Clipping

Clip Task

None Highlight Inside Outside

Clip Method

Inside Any Inside All

Scene

Objects

- ☒ Point Clouds
- ☒ Measurements
 - ☒ Distance
- ☒ Annotations
- ☒ Scans
- ☒ Panoramas
- ☐ CAD Models
- ☒ Other

Properties

x	y	z
89.443	6.279	2.948
88.254	5.507	8.261
88.227	-7.550	8.260

Distances:

5.499
13.057
Total: 18.556

Export: JSON DXF

About

08



This in-house interactive virtual platform allows clients to check the custom design in the scanned digital twin from their own office. It is a vital tool for visualizing the design and showing clients exactly what will be installed. The intuitive visualization solution reduces risk, installation time, and make sure there are no surprises. The platform supports multi-user access and Virtual Reality (VR) viewing, from all major web browsers. The data is secured with security certificates and a unique password for each user for easy access.

CONCLUSIONS



Maritime environmental regulations have led to a surge in retrofits, e.g. with scrubbers and ballast water treatment systems. For older ships without appropriate digital representation of the as-built status, this can be a major headache. 3D Laser Scanning has been found to be a viable solution for such cases. Initially motivated for retrofits, the geometrical digital twin created by advanced 3D laser scanning has been found to be very versatile, being used e.g. also for preventive maintenance or further redesign of engine rooms. In our experience, “data at your fingertips” have saved up to 30% on material cost and up to 35% on manhours in retrofit projects.



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