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SPECIAL PRINT

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**PROSTEP**



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Source: PROSTEP

# CAD/PDM integration platform for shipbuilding

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European shipbuilders started digitalising their internal and cross-company business processes earlier than their competitors in the Far East, but the lead is narrowing. They therefore need to launch a new digitalisation offensive that should focus on the digital product model, claims consulting and software company PROSTEP. The most important measure is the creation of a digital platform with integrations to all relevant IT systems. PROSTEP has developed a standard solution for this purpose: OpenPDM SHIP.

The aim of digitalisation in shipbuilding is to create a digital product model that can be used throughout the production cycle and reflects the exact construction status of the ship in all phases of its life cycle. This digital master, from which the later digital twin of the delivered pro-

duct is derived, not only supports the optimisation of existing business processes, but also enables the development of new value-added services and service-oriented business models in conjunction with data from ongoing operations.

European shipyards, their suppliers and partners need to digitalise their business processes more consistently, PROSTEP emphasises. There are still gaps in the digital information flows, especially at the interface between development and production, but also when exchanging information with partners and suppliers and handing over ship documentation to owners and operators. A particular challenge here is the exchange between mechanical CAD systems and specific applications in shipbuilding such as AVEVA Marine, CADMATIC or NAPA, because these intent-driven sys-

tems do not record the explicit geometry, but only the way it was generated.

The different system philosophies not only make horizontal data exchange between the various CAD systems and downstream applications difficult, e.g. for production control, but also vertical integration with company-wide product data management and enterprise resource planning applications. The latter is a prerequisite for the consistent management of files, the comprehensible documentation of changes and the establishment of relationships with other information objects of the digital ship model.

## Creating a digital platform

Where should European shipbuilders start with digitalisation measures in order to achieve quick benefits? PROSTEP sees

three starting points for a sustainable digitalisation offensive: firstly, the creation of a digital platform; secondly, ensuring digital consistency; and thirdly, the digitalisation of business processes.

The integration of the various IT systems is the basis for efficient information flows and the continuous comparison of information statuses. PROSTEP has developed a data hub based on the OpenPDM integration platform to which many relevant shipbuilding-specific systems can be quickly connected in addition to standard CAD and PDM/PLM systems. The standard solution enables not only the administration of shipbuilding relevant data with common PDM/PLM systems like 3DEXperience, ARAS or Teamcenter, but also the transfer of models from mechanical to intent-driven CAD systems and vice versa.

Mechanical CAD data from CATIA V4, V5, V6 or Siemens NX can be prepared in such a way that they can be referenced and/or natively edited in intent-driven systems such as AVEVA Marine or CADMATIC. The converters developed by PROSTEP recognise the feature information contained in the geometry models and make the model available in any CAD system as native geometry. The solution supports both fully parametric and purely geometric conversion with the option of visually identifying the different quality of the results. Instead of converting geometry, it is also possible simply to reference the information in the component catalogues in the source and target systems and generate new geometry in the target system.

OpenPDM Ship makes a significant contribution to reducing the engineering effort. CAD data is easier to reuse, regardless of whether it was generated with mechanical or shipbuilding CAD systems. By retaining the design intent with all parameters, topological references, attributes or classification characteristics, maximum data quality is maintained during conversion. The conversion results are comprehensible and repeatable for the customer at any time, so that he can expand them step by step: from the exchange of reference geometry to the engineering roundtrip in a heterogeneous CAD landscape.

### Digitalisation of business processes

The use of the integration platform is the prerequisite for a continuous, cross-system digitalisation of the processes in engine-

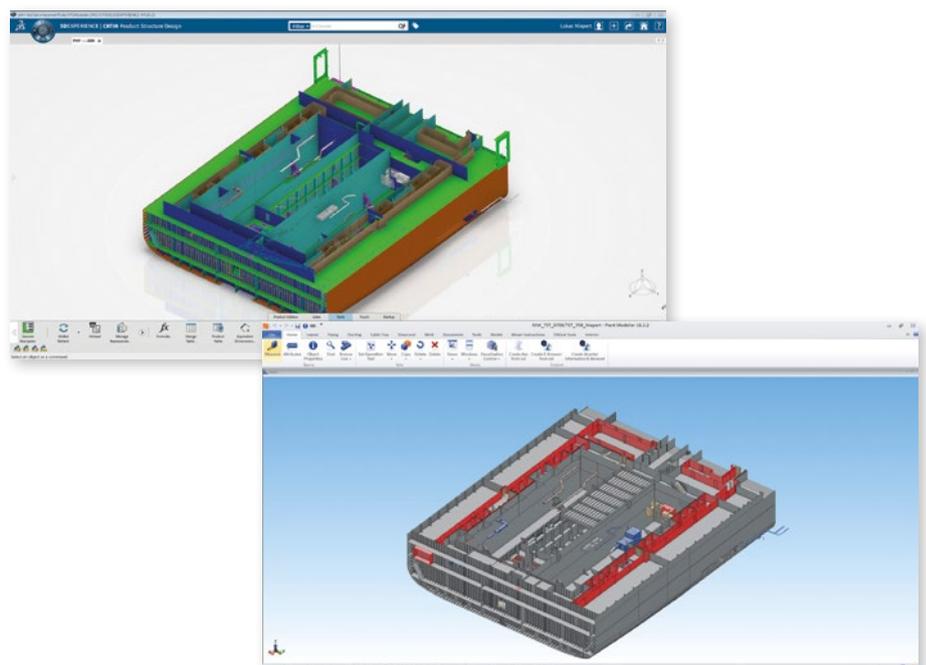


When digital ship data is made available to classification societies and operators, the know-how and intellectual property of shipyards must be protected. Source: PROSTEP

ering, production, classification and operation, but does not automatically lead to the continuous use of the digital information objects. In addition, it must also be determined which information objects are required at which point by which process, who delivers them and where the transmission is currently hampered by media breaks. Based on value stream analysis, PROSTEP uses a standardised method to evaluate information flows and uncover re-

dundancies, bottlenecks and interruptions. Improvement measures can be derived directly from the results of the analysis.

Based on the results of the information flow analysis, solutions for the digitalisation of business processes can be developed or implemented. PROSTEP has developed appropriate solutions for processes such as drawing-less production, 3D assembly planning or the creation of electronic spare parts catalogues, which are also suitable



One of the main obstacles for end-to-end digitalisation is the harmonisation of the different modeling philosophies of classical mechanical and shipbuilding-specific CAD systems. Source: PROSTEP



Based on its OpenPDM technology, PROSTEP has developed OpenPDM SHIP a standard solution for the end-to-end digitalisation of information flows in shipbuilding. Source: PROSTEP

for shipbuilding. There are also initial approaches to digitalising the paper-based process with the help of 3D PDF technology for ship classification (class approval).

Both classification societies and ship operators have a growing interest in the provision of digital ship data in order to process it further and enrich it with their own information. Of course, it must be ensured that the intellectual property of the

shipyards is not endangered. PROSTEP has the know-how and the technology to transfer only the information that the operator actually needs and to protect it with appropriate security measures.

### From digital ship model to digital twin

The digital models of the delivered ships form the basis for the construction of digital twins. Their use offers benefits

to all stakeholders involved in the development, manufacturing, operation and use of ships, provided they are willing to share information. Digital twins enable:

- > more efficient operation and maintenance processes of vessels by operators;
- > new customer experiences for cruise line customers, e.g. through virtual tours;
- > development of new value-added services for spare parts logistics or predictive maintenance by classification societies;
- > optimisation of the next generation of ships, provided that vessel operators provide the shipyards with the operating data.

Shipbuilders, shipping companies and classification societies must therefore agree on how they can jointly master the challenges of digitalisation for the benefit of all. The technical solutions are available today.

PROSTEP not only offers companies in the marine industry a shipbuilding integration

platform, but can also competently support them in defining their digitalisation strategy and implementing the necessary measures. The PLM consulting and software company is a recognised partner of the marine industry and counts renowned companies such as DNV GL, Lürssen, Meyer Group and thyssenkrupp Marine Systems (TKMS) among its customers.

### > ABOUT PROSTEP

PROSTEP AG is a leading, vendor-neutral consulting and software company for any and every aspect of product lifecycle management (PLM). The company provides customers with support for their digital transformation and helps to prepare for Industry 4.0. The portfolio includes PLM strategy consulting and process optimisation, system selection and implementation, PLM integration and migration, as well as secure data exchange and conversion. [www.prostep.com](http://www.prostep.com)

## Read also our Whitepaper about „The Potential for Digitalization in the Shipbuilding Industry“

Free download at [www.prostep.com/whitepapers](http://www.prostep.com/whitepapers)

PROSTEP AG · Dolivostrasse 11 · 64293 Darmstadt · Germany · Telephone +49 6151 9287-0 · Telefax +49 6151 9287-326 · E-Mail [info@prostep.com](mailto:info@prostep.com) · [www.prostep.com](http://www.prostep.com)