

WHITEPAPER

Helping shipbuilders engage with their Digital Asset

How life cycle information management improves the decision-making process

Streamline information sharing

The shipbuilding and offshore industries are facing a surge of new technology with smart ships and thinking machines capable of learning smart operations. Yet, when it comes to information – the very substance of that smart technology – we tend to think of it as a lifeless entity to be produced, manipulated and stored.

That may be partly because technology has traditionally focused on the processes around engineering information, rather than its essence. We have indeed replaced manual methods with automated and semi-automated processes. This has made it possible to produce, manipulate and store data more effectively. It has also increased our ability to control and understand ever larger and more complex engineering information assets.

But how do you infuse that spark of life into engineering design processes to turn data points from passive outputs into active contributors?



Bringing engineering information to life

Celebrating more than 50 years as a leading global provider in engineering, design and Information Management software solutions, AVEVA is revolutionising this traditional way of thinking with a Digital Asset approach.

The Digital Asset, also known as the Digital Twin, is not a software application or solution. It is both a collection of engineering information that describes a physical asset and the framework that brings this engineering information together. In other words, it is a digital representation of the given plant, building or vessel.

Rear Admiral Lorin Selby – Chief Engineer and Deputy Commander for Ship Design, Integration and Naval Engineering for Naval Sea Systems Command (NAVSEA) – during his keynote address at the 2017 NSRP (National Shipbuilding Research Program) All Panel Meeting, referred to this as 'the Digital Twin'.

The Digital Asset approach to engineering Information Management is new, in that it uses advanced technology which can function with data from any source. This is what we call data-agnostic. In fact, every physical asset already has at least some digital engineering information that describes it. The Digital Asset approach unlocks the potential value of this engineering information. It enables further engineering information to be continually added, managed and made use of.

The fundamental principle of the approach is that engineering information should not be considered as transient. Engineering information has a relevance and an importance that may persist throughout the entire vessel life cycle, from the initial concept phase through ship repair and modernization. Engineering information forms the basis for every decision we make, so it should be maintained, kept 'alive' and relevant, with the same diligence as its physical equivalent. It should be made available quickly and easily to everyone who needs access to it, whenever and wherever they need it.



Removing barriers

To coincide with the Digital Asset approach, AVEVA has developed a new type of application, known as AVEVA Engage, that allows you to instantly realise a Digital Asset through a simple touch-driven interface. It is intended to support the widest possible range of activities where intuitive and immediate access to the Digital Asset is valuable.

The application is Windows 8.1 and Windows 10 compatible for large touch screens. It combines Ultra High Definition (UHD) visualisation of an entire model with access to the data and engineering information that makes up the Digital Asset of a plant, building or vessel.

Being able to engage with the Digital Asset via a large touch-driven screen removes barriers to collaboration and decision making. It socializes the Digital Asset by combining engineering information and documents, and putting them in the highly visual and easily navigable context of the 3D model. This enables and encourages multi-discipline consensus building and decision making. By putting the Digital Asset right in the hands of those who need it, precisely when and where they need it, touch screen applications allow you to cope with the increasing pressures of Lean design, capital stewardship and operational reliability.

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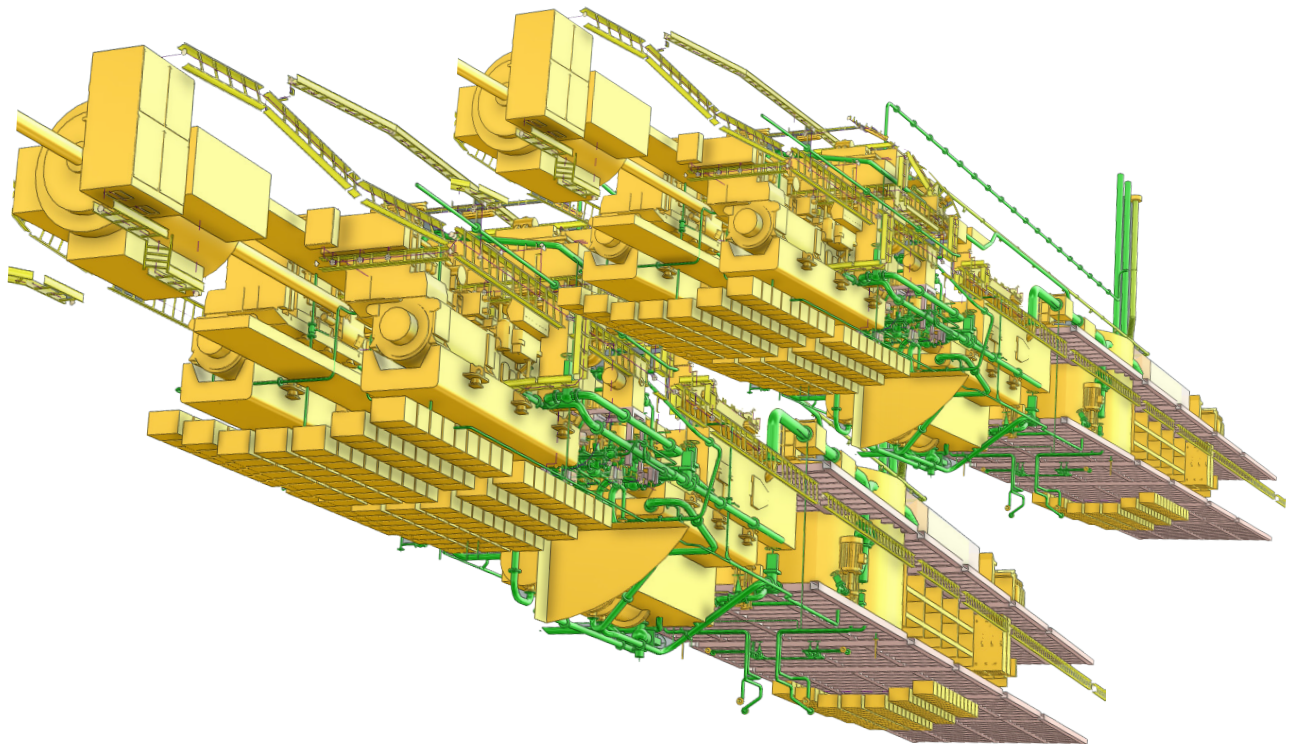
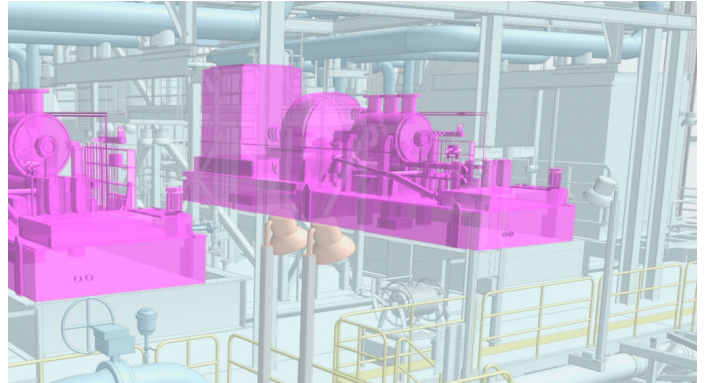
It is widely accepted that, with better information and more intuitive applications, we can expand what is possible in Engineering & Design. The Digital Asset approach allied to touch-driven screen software will become an integral part of decision workflows across the end-to-end shipbuilding project and operations life cycle, which includes:

- Design decision support processes
- Design review process
- Constructability review process
- Commissioning planning
- Central control room work overviews
- Problem solving
- Work-planning processes
- Creation of preventative maintenance jobs
- Engineering information access during repair
- Modification project planning

Benefits compared to the physical model of yesteryear

Not so long ago, most large projects had a large-scale plastic model created to help give the engineers confidence that their designs would work. The model room was the ultimate in 3D accessibility as you could literally walk in with colleagues and have a discussion, while taking measurements.

The advent of Digital 3D has arguably reduced accessibility to 3D for decision making as you need a powerful work station, a copy of some software and a CAD monkey to run it. Touch-screen applications are designed to give that same level of accessibility to a 3D model as the plastic engineering models of yesteryear. You walk into the room, pick a model, and it appears in front of you in seconds in large scale. The application requires no training, making it comfortable for all types of project stakeholders to use.



Case study – Lundin, Norway

Lundin Norway, a subsidiary of Lundin Petroleum, carries out oil & gas activities on the Norwegian shelf. The basis for Lundin's strategy for value-creation is their ability to utilise existing engineering information and to create new knowledge. Lundin is able to achieve this using the Digital Asset with AVEVA Engage for the Edvard Grieg platform, located around 111 miles in the North Sea, west of Stavanger, Norway.

When it comes to operations, maintenance and repair of the Edvard Grieg platform, according to Operations Manager Geir Sjøråsén, Lundin's philosophy is that 'everything that can be done onshore should be done onshore. Our offshore personnel should only execute planned work. I believe the 3D model makes it easier to realise this. Mechanical, electrical, instrument and process personnel in operations are the primary users of the 3D model.

All engineering information required to plan a repair job is presented in one screen: parts, equipment history, future jobs, etc. There is no need to access multiple systems to find engineering information. It's all here, which is a big advantage.'

While using the application, Lundin discovered they could easily find highly-detailed engineering information, all the way down to specific tag details. 'We can, for example, from a 3D object, open the documents and view P&IDs,' says Mr Sjøråsén. 'We can see if we have associated data and whether we have done some work on it before. You don't have to leave the 3D model; you find all the data you need here. That's elegant. You don't have to access three or four systems to find the engineering information you need for the job. You can do everything here in AVEVA Engage. That's pretty cool!'



Towards greater decision support

If you recall, we questioned how we could infuse the spark of life into the information generated by Engineering & Design applications, turning a passive output into an invaluable contributor to key decisions in life cycle management. The key is to ensure that engineering information of known maturity and reliability is made available to those who can benefit from it, when and where it is needed.

The traditional limitations of an application's scope to its own specific type of information need no longer exist. By providing direct access to the extended Digital Asset, engineering design companies are not only blurring the boundaries of the scope of design applications, but also substantially improving the efficiency and effectiveness of the decision-making processes in design through life cycle support.

This intuitive and easily accessible context technology eradicates time-consuming and disruptive searching for engineering information, and removes many limitations on the ability to make prompt and well-informed decisions. Whether maintaining an oil & gas platform in the North Sea or your typical passenger ferry, the same challenge exists for users across the project and life cycle for almost all industries. This inclusion of context technology is just the first step towards adding greater decision support capabilities.

“If we want to work smarter and more efficiently,’ says Geir Sjøråsén, ‘we need the tools to do so. And that’s why we have AVEVA Engage.”

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