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“Digital transformation is not just about upgrading IT systems, modernizing design and management tools or adopting digital manufacturing techniques - it is a profound holistic endeavour that encompasses technology as well as business, skills and workforce development.”

Investing more than \$90 billion, Australia is looking to regenerate and modernize its Navy fleet and in the process, establish a sustainable, modern naval shipbuilding program, create shipbuilding jobs, and secure growth opportunities for the country.

In order to fulfil its ambitions, and to improve global competitiveness and readiness to participate in future opportunities, Australia’s marine industry needs to transform. New digital technologies are accelerating the pace of transformation across the entire industry ecosystem.

CHALLENGES FACED BY THE NAVAL SHIPBUILDING SECTOR

Naval programs are synonymous with complexity. Ships and submarines are complicated products, with thousands of parts that must interact in a limited space. Therefore, designs must be flawless, materials and structures tested rigorously, and systems must have superior functionality and performance.

A completed product can take anywhere between three to eight years to build from when it was first commissioned. Maintenance, repair and overhaul, can add another 40 years to the lifetime of a submarine or ship. Given the lengthy development phase, design, engineering and production need to happen concurrently in order to ensure products are delivered in a timely and cost-efficient manner.

To enable the entire ecosystem to collaborate effectively across design, production, maintenance, repair and operations; customers, partners and suppliers need to share the same data from a single digital source of information – a unique digital representation of vessels that embraces the full traceability, from requirements to systems specifications and final definition.

INDUSTRY RENAISSANCE IN THE MARINE INDUSTRY

Digital transformation is not just about upgrading IT systems, modernizing design and management tools or adopting digital manufacturing techniques – it is a profound holistic transformation endeavour that encompasses technology as well as business, skills and workforce development.

It is all part of the **Industry Renaissance**, a societal transformation being driven by the use of virtual worlds to capture, grow and leverage companies’ knowledge and know-how. By breaking down functional silos and creating end-to-end visibility, the naval sector can quickly sense and respond to fast-changing market demands, and even implement entirely new business models.

VIRTUAL EXPERIENCE PLATFORMS AS THE CATALYST

Virtual experience platforms are the infrastructure of the **Industry Renaissance**. Such platforms must be able to handle 3D data, unstructured data, experimental data, data from machines, data from IoT (Internet of Things) devices, and real-time devices.

New ways of seeing business: Dassault Systèmes’ 3DEXPERIENCE® platform is the only platform that’s both a system of operations and a business model. By harnessing technologies built for knowledge and know-how sharing – inventing, learning, producing and training can be aligned to provide fulfilling customer experiences and not just as-expected products and services.

Insights from synchronizing virtual and real worlds: By eliminating data silos and disparate workflows with a virtual experience platform, new ways of working can be implemented that focus on innovation and value-creation. Navies and businesses will have the ability to forecast, simulate, evaluate and decide, as well as collaborate within the organization and across supply chains, for long term organizational growth and competitiveness.

Increasing ship operational reliability: IoT has become an integral part of digital transformation of the naval industry, enabling the Navy to leverage real-time data collection through sensors on-board ships. Through the development of virtual experience twins and data analytics, critical operational insights to perform preventive and predictive maintenance can be generated, providing a new level of operational reliability and efficiency for naval ships.

Efficient mission outcome: Virtual experience twins offer a systematic framework that can be set up with applications to feed live information and generate required reports from the ship, ensuring higher quality reporting on critical issues without putting extra burdens on the crew. In addition, with a virtual experience twin, simulations and analysis can be performed to optimize ship performance on missions. Real-time data analysis will result in faster and better completion of missions.

Future workforce training can already begin: By using virtual worlds on a virtual experience platform, the workforce has ready access to knowledge and know-how that allow them to learn faster and think more broadly. The result is enriched organizational roles that aspire to deliver memorable and meaningful customer experiences that impact the bottom line.

THE VIRTUAL SHIPYARD PROGRAM



In Australia, Dassault Systèmes has deployed its 3DEXPERIENCE platform, in the **Virtual Shipyard Program**. The program provides digital skills training to small and medium enterprises (SMEs), giving them opportunities to access defense Primes’ global supply chains. Aimed at initiating digital transformation for SMEs, the 3DEXPERIENCE platform supports them to optimize their internal design and manufacturing processes to adopt new concepts. The 3DEXPERIENCE platform also shares best practices from other industries to enable SMEs to continuously improve and re-invent themselves with the power of digital technologies.

With the 3DEXPERIENCE platform, shipyards can build a master 3D virtual model that integrates all related data. This provides a single source of information shared between internal and external stakeholders across the supply chain to accelerate extended collaboration.

The delivery of a new cutting-edge naval fleet will also require skilled future generations. Dassault Systèmes has partnerships with University of Adelaide and University of South Australia to build the **Workforce of the Future** through science, technology, engineering and math education, as well as new ways of working. The program introduces 3D design, modelling and project management modules in the university curriculum.

François Mathieu provides counsel to businesses in the marine and offshore industry on digital transformation projects.

Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes’ collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 250,000 customers of all sizes in all industries in more than 140 countries. For more information, visit www.3ds.com.

CASE STUDY: NAVAL GROUP



Challenge: To maintain their technological lead and competitiveness, Naval Group needed to improve their productivity in the design of their clients’ surface vessels and submarines.

Solution: Naval Group chose the 3DEXPERIENCE platform to converge methods and tools within a single platform shared between their different Naval Group sites, as well as their partners.

Benefits: With the 3DEXPERIENCE platform, Naval Group reduced the cycle time of product design and development, as well as standardized their design methods.

CASE STUDY: NAVAL GROUP AND BUREAU VERITAS



Challenge: Facing limitations with the standard classification process of vessels based on 2D drawings, Bureau Veritas and Naval Group needed to innovate in the way they work together to improve their competitiveness in their respective fields.

Solution: Joining forces, the two companies developed 3D Classification based on the 3DEXPERIENCE platform to reduce design review times of new ships and inherent costs

Benefits: Thanks to the 3DEXPERIENCE platform, Bureau Veritas and Naval Group are pioneering the 3D classification process for marine and offshore industry. This approach has enabled them to accelerate the classification process by improving the quality and speed of their exchanges, dropping the production of 2D drawings and reducing the shipyard’s workload.

