

WHITEPAPER

Technology and process: driving efficiency in naval engineering

How efficient programme delivery can help
address the skills gap



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About Expleo

Expleo is a trusted partner for end-to-end, integrated engineering, quality services and management consulting for digital transformation. We help businesses harness unrelenting technological change to successfully deliver innovations that will help them gain a competitive advantage and improve the everyday lives of people around the globe. We operate in 30 countries.

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Introduction

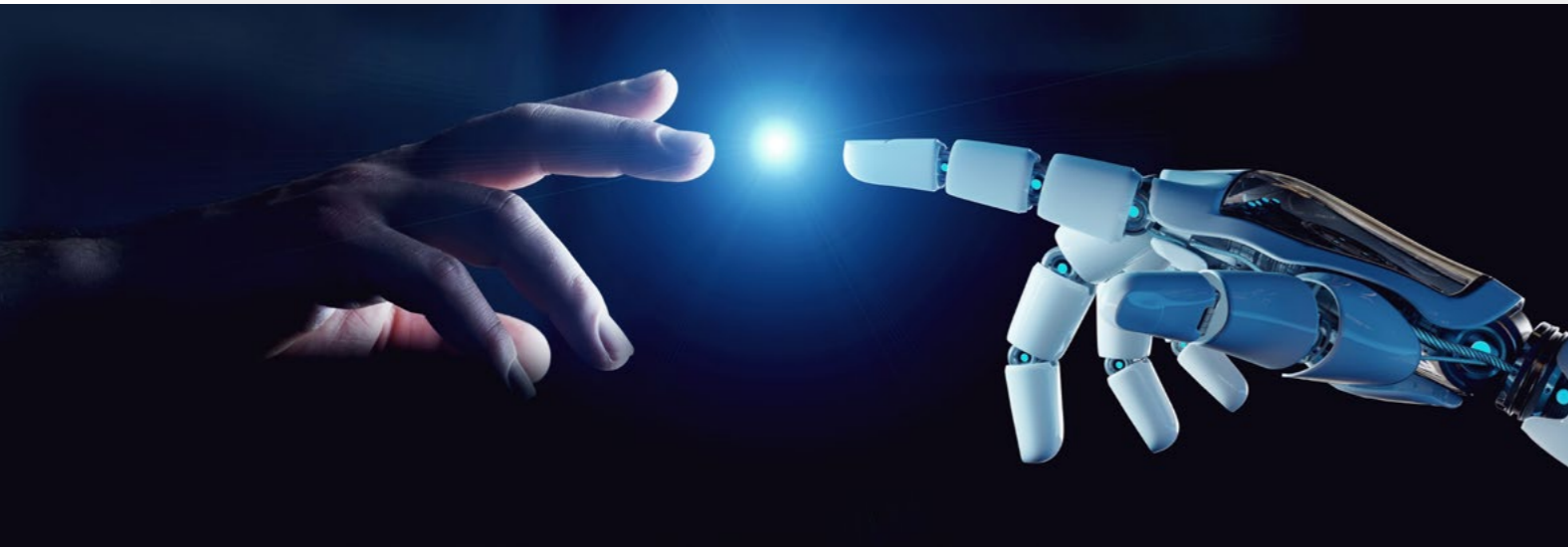
The naval sector is under pressure to deliver a new generation of ships and submarines, existing projects face recurring challenges that continue to be critical to programme delivery. With so many countries looking to expand fleets, the naval engineering sector is a difficult place to be. The industry also currently faces a growing skills shortage due to multiple programme demands. A lack of trainee engineers entering the market to replace the talent and skills lost to retirement is also a key feature.

Delivering complex naval programmes with unique challenges around configuration control and design integration, allied to the sheer size and scale of such programmes, continues to stretch the industry. The skills shortage compounds these issues meaning that Programme Delivery Managers are looking for solutions to help maintain schedule, it remains difficult to ensure quality, control cost and meet delivery deadlines.

Programmes to attract talent into the industry can take time to pay off, but some solutions exist that Programme Delivery Managers can implement right now to boost productivity, drive efficiencies and optimise use of the precious resources they have.

Digital innovation and process automation

Digital technologies such as automation, robotics, and AI, have the potential to deliver extensive time and cost savings for naval engineering programmes. Process automation is specifically changing the way that programmes are delivered, significant savings can be made from automating a single process.



Data gathering and input into the design drawing set is a typical process that can be automated using robotics. Much of the production of the 2D drawing and release process in the industry is an administrative burden. It is a very repetitive and manual process but can be easily automated. Precious engineering decision making time can be freed up, elevating levels of job satisfaction, as the mundane administrative elements are taken away and executed by robots.

Rules-based processes with digital, structured inputs and those with high transaction volumes can also be automated with robotics. Solutions can include Robotic Process Automation (RPA), Optical Character Recognition (OCR) process mining, analytics, and AI, allowing engineers time to focus on more creative, high-value work.

Find out how we are **delivering £1m cost savings** for a major defence client by automating a repetitive manual process impacting the design stage of a critical project.

Operational excellence through digital aids

Expleo strive for operational excellence across all of our design services, tooling services and systems design workstreams, through the use of digital aids.

Our management information system is built on a digital platform, which effortlessly brings together all relevant performance data required to satisfy our designated metrics. Digital dashboards are in place, monitoring the health and status of all our customer programmes. We utilise a basic lean toolset designed around Safety, Quality, Cost, Delivery and People or SQCDP.

The status of everything produced is visible on local digital project dashboards, using large interactive screens for best effect visual management, then automatically rolled up daily, to a business level digital dashboard.

We focus heavily on getting the basics right, measuring right first time, individual performance to declared norms, unit cost of production as well as individual competence and capability. We employ a standard diary approach to the working week, with our meeting structure based on drumbeat quickfire daily stand up reviews, weekly project performance review and monthly customer project reviews. All real-time information is refreshed every two hours, supporting our agreed weekly customer reporting. Having a holistic digital overview across all the different elements of our complex naval programmes, offers real opportunity to drive both time and cost efficiencies, without sacrificing on quality, whilst reducing management burden. We also promote integrated working with our customers and offer innovative solutions that can significantly improve performance at the customer site too.

To ensure bottlenecks are avoided and individual product status can be understood at speed, Expleo employs a workflow management system, built again on software programmes. This Kanban system monitors outputs through the workstream process and reports on products through to completion and release. Outputs continue to be checked on completion by an approved engineer though, prior to formal release.

The automated system is again doing the majority of the work allowing the engineer to focus on the value add.



Agile

Agile began as a methodology designed for fast-paced software development. One of the most important aspects of agile is that it's data-driven, ensuring that decisions are taken based on the latest data available.

But perhaps the biggest potential benefit to naval engineering, is that agile working helps to make large-scale complex projects more efficient, by making them more adaptive and less prone to costly rework.

The responsive nature of an agile team means problems don't need to cause delays or rework. Combined with visual management, using agile methodologies to foresee problem areas can ensure the right skills and expertise are ready at the right time, to efficiently tackle any challenges that arise, preventing rework further down the line and making better use of limited resources.

For instance, resolving a complex problem might require the attention of a senior engineer, implementing the solution devised by a senior engineer could be carried out by a junior, for example. The senior engineer can oversee their contribution to the work but apply his expertise to another high-value task, driving greater efficiency, boosting productivity, and maximising resource.



The future of naval programme delivery

There is a great deal of change happening in the way naval programmes are delivered. In the future fully cross-functional and cross-fertilised engineering teams can be the backbone of naval engineering.

Adoption of digital solutions and methodologies can help today while we work towards that future. Technologies such as RPA and digital programme dashboards can be introduced to drive significant cost and time efficiencies.

Visual management styles and agile working can be implemented quickly. Every naval programme can rapidly enjoy the benefits of strong processes, better training, and operational excellence that will make the most of our naval engineers and deliver better projects today.



**At sea, speed
is everything.**



Speed up your naval engineering delivery capability and drive operational excellence for enduring performance.

Our trusted team bring the cross-industry experience, credibility and capability to accelerate your critical-path. Through our engineering expertise, we work with our customers to drive value and increase their competitive edge to help deliver sooner, smarter, better.

- Experience, credibility and capability to accelerate programmes and help our customers deliver on time, shortening the critical path
- Bring deep engineering technical expertise
- Offer smarter solutions with clarity to engineer the solution to fit
- Improved cost efficiencies with innovation
- Able to harness technology and leverage the right engineering expertise across domains to help customers improve margins and minimise risks

Navigating tomorrow, delivering today.

Meet the authors



SEAMUS BROGAN,
Operations Director – Marine

Seamus is a Business Manager with over 25 years of experience working in the Marine and Defence sector for BAE Systems, SEA and BMT. Seamus has led numerous successful teams to deliver outstanding results, most notably was the Type 45 Power Improvement Project and Communication Coherency for Submarines. As Marine Operations Director for the UK business Seamus is responsible for delivering projects to time and cost whilst ensuring the customers' needs are being met.



ED FRY
Engineering Manager

Ed is responsible for client delivery, business growth and meeting strategic objectives at Expleo. As a seasoned professional with over 35 years of Software & Systems Development as well as management of complex highly regulated programmes, Ed is known for driving high performance, technical and operational excellence and capability growth. With experience across multiple domains and industries – he is able to offer a holistic perspective to provide solutions and strategies to meet immediate and longer-term goals.



ANDREW ALCOCK
Head of Operations

Andrew is an experienced Head Of Operations with a demonstrated history of working in the mechanical or industrial engineering industry. Skilled in Operations Management, Aircraft Maintenance, Quality Management, Systems Engineering, and Manufacturing.

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