

Predictive Analytics and Optimisation



BAE SYSTEMS

We are Techmodal

A collaborative data consultancy, bringing the capability and creativity you need to unlock the strategic potential in your data.

As Defence and Government experts, we understand the unique complexity of your constraints. Adaptive, imaginative and iterative, we meet you where you are – and start with what you have.

We focus on making more of your existing tools and technology. Applying smart thinking and continuous improvement to uncover the insight in your data – and help you move past your stickiest problems. Optimising your investments, operations and outcomes. Maximising the impact of your resources towards a better future.

Our clients operate in high-stakes, highly technical and highly secure environments. The pace is fast; the demands are complex and the cost of getting decisions wrong is high. They need partners who bring clarity, precision and practical expertise – not complexity for its own sake.

Our value comes from combining deep analytical strength, applied technology expertise and hands-on consulting experience. We turn ambiguity into clarity and insight into action.

What we offer

We operate at the cutting edge of digital innovation and at the heart of organisations that keep vital infrastructure running, national security protected, and armed forces prepared. Our teams provide:

Decision advantage

We give organisations the insight to act with clarity and pace, ensuring choices made today hold up under tomorrow's pressure.

Our strength comes from being data-led, operationally aware and grounded in real-world context. We explore options, test scenarios and highlight trade-offs before action is taken, building confidence in complex and high-consequence environments.

Technology that works

We help organisations unlock the full value of their technology and existing investments. Our solutions are shaped to our clients' environments – secure, scalable and designed for reuse – delivering faster outcomes and greater value for money.

We stay user-driven, not technology-driven, ensuring what we build is usable, dependable and impactful.

Delivery impact

We work shoulder-to-shoulder with clients to turn ambition into results. Our approach is collaborative, adaptive and focused on rapid progress.

We build momentum early, provide clear answers before the conversation moves on and ensure delivery stays aligned to purpose. Whether defining strategy or supporting implementation, we bring clarity, structure and practical leadership.

Strength in secure and complex environments

All our work is delivered by security-cleared teams who understand the realities of Defence, national security and critical infrastructure.

We design and assure solutions that are resilient, secure and governed — engineered to work in environments where constraints are real and reliability matters.

Powered by BAE Systems Digital Intelligence

We combine the pace, creativity and agility of a specialist consultancy with the depth, reach and security of BAE Systems.

Clients benefit from a unique blend of niche expertise and enterprise-scale capability, with seamless access to Digital Intelligence, engineering, cyber and equipment programmes when required.

Service Overview

Techmodal has 20 years' experience of applying data science methods to address our clients' business challenges. We help our customers to digitise workflows and enhance those workflows with Artificial Intelligence (AI).

We employ the latest tools and thinking in the field of advanced analytics, including predictive, prognostic and optimisation techniques, to help our customers extract maximum value from their data and make better decisions. We have proven experience of handling data sets in a wide range of formats and at various degrees of scale, quality, complexity and maturity to reduce manual effort and produce sustainable insights and decision support tools, often combining different data science and AI techniques (Machine Learning, Large Language Models, Natural Language Processing, Computer Vision, Agentic AI) to solve complex problems and answer difficult questions.

Techmodal specialises in developing solutions iteratively and responsively, addressing initial requirements and flexibly accommodating changes during the development process. We work collaboratively with our clients to deliver projects at the full range of maturity and Technical Readiness Level (TRL), from data discovery and strategy to capability demonstrators and hosted production applications.

We have a demonstrable track record of employing the latest vendor tools and open-source technologies, along with proven solution deployment credentials, utilising both cloud and on premises infrastructure and working in secure environments.

- Our service brings together our extensive technical expertise with a sharp focus on business need. We have experience of integrating capability powered by data science and advance analytics into our customers' existing processes and solutions and of deploying AI in secure environments.
- Our solutions can incorporate a web-based User Interface (UI) to enable users to easily interact with the models and outputs.

Predictive Analytics and Forecasting

Forecasting is a discipline which considers historical data to predict or estimate a future event or trend. The ease of predicting an event depends on how well its contributing factors are understood and how much data is available to support the analysis.

- Our data scientists identify and apply the most appropriate forecasting model to maximise the accuracy of the results in a particular context. Time-series forecasting is used to understand and predict trends, enabling organisations to use resources more efficiently, estimate recurring costs and predict future events, such as vehicle faults or stock usage.

We provide domain expertise on the practical exploitation of platform data including Health and Usage Monitoring System (HUMS), and build bespoke solutions to integrate analytics, dashboarding and AI/ML techniques to maximise the value of the customer's investment in equipment sensor capability. These solutions ensure decision makers are equipped with the most relevant information when determining appropriate actions or contingency planning for platform & fleet management, Availability management, reliability analysis, fleet rationalisation and supplier management. Customers are better enabled to meet global commitments more effectively than ever before.

Our successes include:

- Developing a bespoke application to analyse and report on HUMS data from a major Land platform, accurately predicting critical failure events by correlating vehicle sensor readings with faults. Our solution provided a powerful analytical capability for data that is complex, fragmented and difficult to access and extract and helped enable predictive and prognostic analytics.
- Creating a set of Machine Learning models trained on historical events to predict future failures for Naval fleet deployments. Our predictive analytics capability was applied to the Royal Navy's Carrier Strike Group (CSG). We produced a prediction engine that forecasted system-level capability deficiencies, informing measures and interventions to sustain capability during deployment.

Optimisation

Our optimisation solutions help identify the most advantageous outcome in a complex decision space. They aim to find the best acceptable answer, given a particular set of conditions, enabling users to weigh different characteristics of the outcome. The prevailing conditions can also be adjusted, enabling users to model the impact of pulling different levers to help achieve a more desirable outcome.

We have helped our customers to solve business-critical optimisation challenges including:

- Using a cloud-based algorithmic approach, we dramatically reduced the time taken to create an optimised schedule for pilot training, improving reporting and analytics and enabling scenario modelling and comparison. Schedule preparation time was reduced from weeks to minutes.
- Developing a user-facing application powered by a multi-dimensional optimisation algorithm to optimise the matching of candidates to positions in a complex operational environment. Our solution enabled users to define and adjust competing priorities and conditions to model optimal outcomes providing fast and flexible matching of individuals to roles based on adjustable priorities (e.g. retention, operational excellence, etc.)

Flexible Deployment and Hosting

We work with our customers' existing technology stacks wherever possible to maximise the pace of delivery, align with wider digital and data strategies and derive maximum value from existing investments. To support this, we are experts in using a range of COTS and open-source tools and platforms, ensuring we can bring the most effective solution to our customer's challenges.

Techmodal has repeated experience of developing and deploying data science and analytics solutions on customer platforms, including on-premises infrastructure and cloud environments such as Amazon Web Service (AWS), Microsoft Azure, Oracle Cloud Infrastructure (OCI) and Google Cloud Platform (GCP). Our work spans different classification levels, and we have experience of MODCloud (AWS, Azure and Palantir Foundry), Army Hosting Environment (AHE) and Navy Digital environments.

Service Features

- Repeatable data processing and Extract Transform & Load (ETL) pipelines
- Machine Learning Models
- Optimisation Algorithms
- Forecasting & Predictive Analytics
- Customised data visualisations
- Friendly user interface for seamless interaction between human & AI
- Secure and proven within Defence
- Clear, ethical development practices and outputs that empower end users

Service Benefits

- Proven approaches and model architectures
- Strong track record of deploying NLP-powered solutions in secure environments
- Scalable solutions, either on-premises or cloud
- Flexible infrastructure and hosting options
- Vendor agnostic and experienced in open source software
- Greater utility from existing data
- Enhanced business decisions
- Improved process efficiency
- Enabling delivery of strategic objectives
- Managing compliance to contractual, legal and policy requirements

End of document

Contact: John Atkins
tenders@techmodal.com