

Availability Planning 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's Availability Planning and Optimisation (APO) service enables organisations to identify and assess optimal means of improving, maintaining, or achieving high availability of complex assets or equipment, whilst balancing key metrics across cost, risk, and resource. Our service integrates with business data sets, client technologies and established processes to help organisations configure themselves to be ready and responsive to operational, emergent, and long-term commitments, requirements, and goals.

We employ a comprehensive range of modelling approaches and technologies to suit client requirements and leverage client technology investments. This includes Discrete Event Simulation (DES), Agent Based Modelling (ABM), System Dynamics, and cost & risk modelling methodologies.

Our Agile delivery approach is ISO-9001 compliant and follows the Government Digital Services (GDS) framework, applying the principles of iteration, user-centred design, and collaboration. Techmodal's APO service offering is delivered in four stages:

- 1. Discovery & Data Collection:** An exploration and understanding of the organisation's objectives, challenges, and constraints. Identifying the business questions to be

answered. In tandem, our team collaborates with stakeholders in gathering relevant data from various internal and external sources for building accurate and reliable models. Data is assessed for quality, completeness, ownership, sensitivity, and relevance.

- 2. Model Development:** Computational and/or simulation models are constructed based on the collected data and the specific requirements of the strategic decision-making process. This is done in collaboration with stakeholders and end users to ensure models are relevant and aligned to the business context in which they will be used.
- 3. Scenario Analysis:** Developed models are used to conduct scenario analyses, where scenarios are evaluated to gauge their potential impact on the organisation's objectives. This identifies optimal strategies and mitigates risks.
- 4. Business Insights and Reporting:** Findings from the scenario analyses are synthesised into actionable insights and presented in a clear and concise manner, with a focus on User Interface and User Experience (UI/UX) design for Business Intelligence (BI) and data visualisation. Reports are generated to communicate key findings, KPIs, and recommendations to stakeholders, enabling informed strategic decision-making.

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, produce sustainable insights and develop decision support tools. Utilising the latest vendor tools and open-source technologies on cloud and on-premises infrastructure, we combine extensive technical expertise with proven solution deployment credentials and sharp focus on business need, often working in secure, constrained environments.

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 modelling and analytics solutions on customer platforms, including on-premises infrastructure and cloud environments such as Amazon Web Service (AWS), Microsoft Azure and Oracle Cloud Infrastructure (OCI). 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.

Where required, we provide flexible support, training, and knowledge transfer services to ensure client staff are upskilled on using and sustaining APO capability. Our services include

an online Service Desk (with a full issue resolution cycle between user and specialist), floorplate support, bespoke and flexible-format training packages.

Techmodal's APO service has helped clients to make better decisions with how they can optimise their equipment and increase availability.

- **Fleet Management modelling:** We have applied our APO service using simulation techniques for complex assets. Asset service lifetime was modelled allowing for different approaches to fleet management to be compared empirically. Using cost modelling data, a cost/benefit analysis of scenarios was assessed to understand the cost of unavailability versus the cost of policy implementation.
- **Whole Life Cost Modelling:** We have constructed numerous Whole Life Cost Models (WLCM) through our APO service for various complex equipment allowing for the lifecycle of costs to be understood and scenarios to be compared.
- **Warship Cost & Availability:** Our APO service has been embraced for a major Ship Cost & Availability programme, using a DES model and accompanying cost model to investigate fleet availability and determining factors. An excel cost model was also created that utilised output data from the simulation. Through iterative development and comprehensive testing, the final product facilitated the identification of pivotal KPIs and actionable business insights essential for guiding strategic decisions and optimising fleet management strategies.
- **Submarines High Level Scenario Model (HLSM):** We have worked collaboratively with our colleagues in BAE Systems Submarines over the last six years to develop and establish a simulation modelling capability that provides analysis insights to support senior decision makers and briefings. This is centred around a high-level simulation model (built in Simul8) that can model the build of varying numbers & classes of submarine, representing the major build activities on the major units across different facilities, capable of assessing impacts from a resource, capacity facility and cost perspective over a long time period.

Our role has included developing and enhancing the model, supporting scenario analysis and providing support and guidance to the team to help them move from informed users to be able to develop models in-house. We have also developed a number of lower-level models of individual facilities as well as Excel and PowerBI interfaces and dashboards to support the analysis and comparison of scenario outputs. The HLSM has provided the ability to analyse current and potential future facilities through multiple scenarios with much more flexibility and fidelity compared with previous methods. It helps provide a better understanding of the likely impact of differing scenarios and 'what-if' questions from a build duration / schedule and capacity perspective.

- **Supply Chain Inventory Forecast Intelligence (SCIFI):** We have delivered a series of projects working collaboratively with our customer to provide a smarter way to manage and forecast Integrated Forecasting & Planning (IF&P) issues. We scoped,

developed, verified and handed over a data-led platform that brings together all supply chain data into one trusted view – from ERP systems and local tools, into a Tableau dashboard that cross functions can use to make better informed decisions. It provides an end-to-end view of the supply chain – combining operational and financial insight to improve visibility of risks and drive faster, more confident planning decisions. It supports the shift towards consistent tools and processes across programmes, allowing analysis of change impacts on cost, availability and delivery. It has reduced time and effort spent producing financial reports and forecasts, improved transparency on risks and created a single, trusted view of supply chain data.

Overall, by following the four key stages, Techmodal's APO offering can provide organisations with the benefit of a structured approach to navigating complex strategic challenges, facilitating informed decision-making, and driving long-term success.

Service Features

Our Availability Planning and Optimisation service includes the following features:

- Consultancy services to identify key business questions and model design
- Development of robust, scalable, iterative modelling capability aligned to business need
- Use of open-source and COTS platforms and tools aligned to business need
- User Interface and User Experience (UI & UX) development
- Flexible support and training options based on business and user needs
- Provision of scenario analysis and presentation of analysis insights e.g. to explore potential performance, resource demand / utilisation, risk and drivers of those
- Capability transfer to enable in-house teams to effectively utilise the models / toolsets
- Scalable solutions, either on-premises or cloud
- Alignment with existing enterprise solutions, such as inventory and business management systems; Business Intelligence tools etc.
- Discrete Event Simulation, Agent Based Modelling, System Dynamics
- Cost and Risk Modelling
- Compliant with ISO-9001 and Government Digital Services (GDS)

Service Benefits

- **Improved decision making:** By simulating scenarios and analysing outcomes, decision-makers gain valuable insights for informed choices.
- **Risk mitigation:** Modelling identifies potential risks, enabling the development of contingency plans to minimise adverse impacts.
- **Resource optimisation:** Identifying promising opportunities aids in prioritising investments, optimising resource allocation for strategic goals.
- **Enhanced strategic planning:** Quantitative analysis and scenario planning enable anticipation of future trends, fostering resilient strategies.
- **Competitive advantage:** Anticipating market changes and responding proactively empowers organisations to capitalise on opportunities, staying ahead of competitors.
- **Stakeholder alignment:** Modelling facilitates communication among stakeholders, fostering collaboration and ensuring decisions align with organisational objectives.
- **Long-term perspective:** Encouraging a focus on future performance and sustainability helps organisations avoid short-term thinking, creating long-term value.
- **Continuous improvement:** Through iterative refinement based on new data and insights, organisations adapt strategies in real-time, staying responsive to evolving market conditions.

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