

Medical Operational Analysis & Simulation Modelling



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

Our **Medical Operational Analysis & Simulation Modelling** (Med OA) service has been developed to provide evidence-based decision support at the most senior levels of medical organisations. Our multidisciplinary approach utilises consultancy skills to unpack the question and help organisations act as an intelligent customer, through simulation modelling, wargaming, software development and business intelligence techniques. Our approach has evolved along with customer requirements, with a proven track record of delivery against a range of business challenges from operational-level support to Strategic level policy and balance of investment activity. Our reputation for quality, timely and relevant delivery has seen significant growth in our customer base, with significant SC and DV cleared expertise in Defence Medical Services within strategic headquarters and across front line commands.

Our Med OA service is used to support **strategic level policy and strategy formulation**, providing policy makers with a rapid view of the implications of policy and financial decisions on operational outputs. This is underpinned by the **CHIRON end-to-end patient flow simulation model** and business intelligence tools – developed in-house using Python, React and Microsoft PowerBI, and deployed onto Authority systems.

The CHIRON model simulates the flow of patients in a deployed operation from the point of injury to evacuation through various levels of deployed medical care. The model can

quantify deployed hospital requirements for any planned operation, from the number of operating tables in use to the requirement for in-theatre transport and consumable equipment. As a result, clients can assess the efficacy of operational planning and the impacts of capability shortfalls or enhancements, in unprecedented detail.

We provide a **data driven wargaming solution** to support senior level decision making, including;

- Designing wargame approach including identifying and pre-briefing key stakeholders on roles and desired outcomes.
- Developing supporting tools and datasets to enable live modelling, facilitating wargames including home team and red team activity.
- Delivering flash reports and issuing final reports with recommendations for process improvement.

The approach has been successfully delivered to senior stakeholders in Defence, and for education and training purposes with university and professional academy student cohorts. Strategic Medical wargames for Defence and the NHS have been supported by modelling & analysis using CHIRON, generating clear evidence of how medical decisions can improve operational effectiveness of fighting units and ultimately improve UK forces' survivability.

Our Med OA experts are skilled in **workshop organisation and facilitation**, bringing SMEs together to assess capabilities and processes and to agree future planning assumptions. Our strategic modelling needed to replicate a range of medical specialisms in detail, ensuring that medical planning can include everything from trauma and emergency care to routine dental treatment. We have conducted interviews, workshops and process analysis to understand the Operational Patient Care Pathway in its entirety and to translate this information into a simulation model.

Service Features

- Strategic level decision support including wargaming
- Medical requirements capture & capability analysis
- Patient flow simulation modelling & Business Intelligence
- Process mapping
- Workshop design & facilitation

Service Benefits

- Data-driven and evidence-based decision making
- Cost-benefit analysis to support balance of investment activity
- Optimised patient flow & medical resource allocation
- Optimised inventory spend and stockpiling strategy
- Rapid scenario assessment

End of document

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