

Applied Generative AI and Large Language Models



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 Generative Artificial Intelligence and Large Language Models (LLMs) to enable our customers to leverage these fast-emerging technologies, particularly in constrained and secure domains where use of standard open LLMs (i.e. with internet access) is not possible.

We understand how to apply LLMs to complex, disparate data quickly, securely and with the right level of assurance to answer complex, mission-critical question sets. We recognise for LLMs that assurance, explainability and ethical use are crucial factors for successful exploitation and trust. We place these principles at the centre of our development approach. Our clients understand how any outputs are determined, bringing confidence in the work we deliver.

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, constrained environments.

Service Capabilities

- Our service brings together our extensive technical expertise with a sharp focus on business need. We have experience of integrating generative AI (with a particular specialism in LLMs) into our customers' existing processes and solutions and of deploying generative AI in secure environments.
- We have experience of combining Retrieval Augmented Generation (RAG) with LLMs to surface the content of documents and unstructured data in simple and usable ways, and Agentic workflows and systems for complex solutions with various degrees of autonomy.
- Our solutions can incorporate a web-based User Interface (UI) to enable users to easily interact with the models and outputs.
- We have supported multiple customers in the adoption of generative AI. For example:
- The Defence Data Analytics Platform (DDAP), provided by the Digital Foundry in Defence Digital, is the MOD owned platform for carrying out data science and data analytics. On DDAP we have implemented the first scalable solution for hosting open-source Large Language Models (LLMs) on the platform, moving defence forward in its ability to leverage the power of LLMs on sensitive data.
- MODGPT is a project being delivered by the Defence AI Centre (DAIC) to provide secure access to a ChatGPT-like chatbot interface to the Defence community. As part of the team delivering MODGPT we have been enabling Defence users to gain a better understanding of the potential use cases, risks and benefits of enterprise-wide access to LLM services.
- Working with the DAIC AI Accelerator program to deploy the DAIC's first Agentic workflow, we educated the client in use of Agentic approaches whilst demonstrating the improved performance of Agentic RAG over the traditional approach; highlighting where these approaches are viable, and what the risks, drawbacks and costs are with tangible working examples.
- Embedded within BAE Air's Data and Analytics team, we have been developing intelligent systems for process efficiency within a manufacturing context; creating Proof of Concepts (POCs) proving Agentic's ability to optimise real world engineering processes.

Internally, we are leveraging the opportunities presented by GenAI by developing applications and toolkits to optimise some of our Operational Analysis consulting product offerings, most notably automating and augmenting operational wargaming with LLMs to generate pre-game material, act as a bot to answer scenario questions of players, creating an equal knowledge base for all participants, and injecting real-time scenarios to enhance event realism.

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 Commercial Off The Shelf (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

- Large Language Models (LLMs)
- Retrieval-Augmented Generation (RAG)
- Model deployment via DevOps/DevSecOps pipelines
- Research and experiment with model types and architectures
- Friendly user interface for seamless interaction between human & AI
- Repeatable data processing and Extract Transform & Load (ETL) pipelines
- Clear, ethical development practices and outputs that empower end users
- End-to-end discovery and development, from strategy to deployment
- Develop-low, deploy-high
- Repeatable data processing and Extract Transform & Load (ETL) pipelines

Service Benefits

- Proven approaches and model architectures
- Strong track record of deploying Gen AI-powered solutions in secure environments
- Clear focus on model assurance, explainability and ethical use
- Latest in Machine Learning and AI technologies
- 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

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