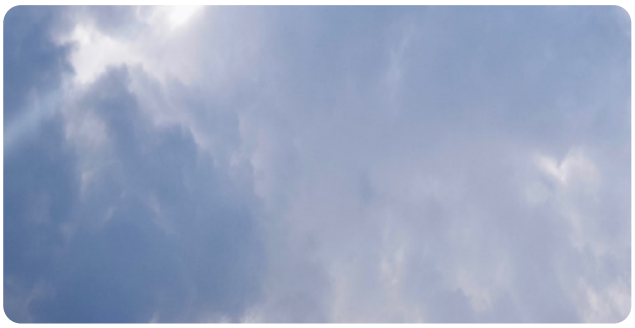

Crown Commercial Service

# Generative AI Technical Implementation

## GCloud Service Description

**Bringing Ingenuity to Life.**
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# Generative AI Technical Implementation

## 1.1 Short Service Description

PA's expert Generative AI team specialises in implementing bespoke Large Language Model solutions, tailored to specific business needs, refined and optimised using your own data, within your infrastructure. The team can deliver from prototypes to full-scale implementations, integrating ethical and security best-practice. We have helped clients increase efficiencies by 90%

## 1.2 Key Service Features

1. Creation of bespoke generative AI solutions.
2. Cloud hosted scalable solutions.
3. User research assessing functional requirements of AI solution.
4. Integration of ethical guidelines into solution development and deployment.
5. Augment LLM with RAG (Retrieval-Augmented-Generation) framework or fine-tuning model.
6. Exploratory data analysis and prototyping.
7. Back-end infrastructure for deploying GenAI solution.
8. Front-end interface development.
9. Upskilling clients to use AI and maintain infrastructure-as-code solution.

## 1.3 Key Service Benefits

1. Increased operational productivity and efficiency.
2. Reduced cost associated with generating content or replies.
3. Automation of repetitive manual tasks.
4. Technical innovation.
5. Workforce upskilling in use of generative AI tools.
6. Maximising value of your data.

## 1.4 Service Definition

The implementation and use of Generative Artificial Intelligence (GenAI) solutions are becoming essential for businesses to remain competitive and increase productivity. In particular, the release of new Large Language Models (LLMs) has introduced a general-purpose technology enabling computers to respond like humans, forever changing the landscape of how activities are delivered through opportunities for automation and augmentation to tap previously unattainable efficiencies, as well as to do things previously impossible or impractical due to the amount of data.

Our expert GenAI team at PA offers end-to-end technical GenAI implementation solutions tailored to your needs. We will work with you to craft the design of your GenAI solution, performing exploratory data analysis to evaluate the data that we intend to use to optimise the performance of an LLM. A platform can either be built upon RAG architecture (Retrieval Augmented Generation) that enables large language models to generate responses using similarity retrieval against the knowledge base of data, or use of the dataset to fine-tune the model. The model outputs will be evaluated for accuracy and correctness through rigorous user testing, specifically checking for hallucinations, failure to capture relevant information to answer the user query, and failure to directly answer the question. The PA team is able to handle and mitigate these issues by iterating over the AI solution configuration and prompt query wording. This evaluation is carried out alongside development of the data engineering flows and web-application development necessary for users to interact with the model in production. The PA team will provide training both for the end-users and knowledge transfer sessions for data teams that will maintain the solution.

**Example project structure and timelines for a Minimum Viable Product (MVP):**

- **Phase 1 - Discovery Phase** (2 weeks) –. The team will be onboarded and conduct the following:
    - the exploratory data analysis to assess the suitability of the data
    - the final architecture design, including the infrastructure and software components and the performance optimisation strategies required to process the data in scope
    - the user research to inform the final requirements for the functional access that aligns with the users needs of the LLM GenAI tool and web interface design
    - Define the backlog for the subsequent two development sprints
- **Phase 2 – Dev Sprint 1** (3 weeks) – Build the cloud deployment and data processing pipelines, select the appropriate framework in line with future deployment requirements (for example, cloud vs local on-prem), optimise the performance of the LLM GenAI solution and update the web interface in line with the agreed designs.
- **Phase 3 – Dev Sprint 2** (3 weeks) – Carry out user-testing against an agreed framework and set of testing prompts to evaluate the quality of the responses generated by the solution. We will iterate both the back-end and web interface in response to the feedback collected during user testing.
- **Phase 4** (2 weeks) – We will perform unit, integration and system testing to ensure the combined parts of the solution work together as intended. We will implement the authentication logic to ensure the solution is accessible to only the agreed users. We finally conduct two training sessions (user-based and technical training).

**Successful examples of developing and deploying LLMs into production**

We recognise the critical balance between providing advisory support and execution. We specialise in helping clients who are looking for a partner that can both successfully implement emerging technologies and provide strategy support to ensure these technologies do not only meet immediate needs but also contribute to meeting your vision.

We have successfully designed, developed and deployed AI and GenAI solutions for many of our clients:

- Developed and deployed a virtual GenAI assistant capable of helping engineers answer technical questions more efficiently for a Danish Energy company in 10-weeks
- Developed a GenAI chatbot for a leading Danish logistics company that has significantly reduced the cost of responding to customer enquiries. The solution was built and launched in 8-weeks, and can resolve customer queries more effectively and efficiently than previously

- Built a GenAI chatbot for BUPA capable of answering customer questions ranging from FAQs to pricing and complex import queries. We developed a prototype in 7-weeks to replace complex rules based chatbot that previously took 1 year of development and significant effort to maintain
- Developed our own “White Label” LLM platform, currently focusing on helping its 4,000 consultants with knowledge sharing
- Built a GenAI solution to enrich insights from survey data to identify key themes and understand how employees feel at Dounreay
- For the Dutch Ministry of Health we have used LLMs and our bespoke LLM platform to predict parliamentary questions on proposals for new legislation
- For a professional services firm, we have used our White Label LLM platform to consolidate the free text comments from personnel surveys, providing them with new insights into how employees felt within their organisation
- For eBay we used LLMs to summarise the sentiments and key pain points from their consumers, enabling eBay to focus on improving what really matters

In addition, we have helped clients at both the very start of their AI journey by shaping data strategies and AI blueprints to set up their AI capability, and those who are looking to scale their Proof of Concepts and/or Minimum Viable Products across their organisation, which is detailed in our additional service: AI Strategy, Blueprint and Roadmap.

## 1.5 Why PA Consulting Group (PA)? A trusted partner for cloud, AI, and digital technologies

PA Consulting Group (PA) is a leading technology and innovation consultancy and one of the UK government’s most trusted advisors, combining strategy, delivery assurance and deep engineering to turn complex ambition into assured outcomes. We bring end-to-end capability across cloud architecture, data and AI, cyber, and advanced technology R&D, backed by a track record of scaling innovation in the public and private sectors.

Our UK work is anchored by secure, standards-led delivery. PA maintains ISO/IEC 27001 certification across global operations, demonstrating disciplined information security and operational control, and applies UK government good practice (GDS, NCSC CAF) across cloud and digital programmes.

We combine consultancy with real engineering. At our Global Innovation & Technology Centre (Cambridge), 300+ scientists, designers and engineers operate extensive labs and studios to prototype and industrialise solutions, bridging physical and digital from concept to production.

### 1.5.1 Why PA for cloud, data and AI

- **Hyperscaler alliances without vendor lock-in.** PA is Premier Tier with **Google Cloud** (13+ years; 150+ certifications; specialisations in infrastructure, data analytics, app dev and security) and holds deep **AWS** and **Microsoft** credentials, accelerating secure data foundations and generative AI at scale while keeping advice independent and outcome-led.
- **Responsible AI you can trust.** Our Responsible AI framework, governance toolkits, and risk policy make AI adoption transparent, auditable, and compliant, embedding lifecycle controls, model documentation, and human-in-the-loop safeguards aligned to evolving regulation.
- **Impact beyond pilots.** We help organisations become *intelligent enterprises*, using data and agentic AI to create and protect value, with pragmatic roadmaps from use-case selection to scaled operations.
- **Proof through delivery.** Our client stories span enterprise data platforms, IoT and analytics (e.g., Rentokil Initial), and product innovation at scale (e.g., Unilever) where PA has put data and AI at the heart of continuous, market-leading improvement.

### 1.5.2 Cloud capability (assess, design, build, assure, run)

PA applies an assured cloud delivery approach to complex government and regulated environments, blending client-side delivery assurance, multi-cloud architecture, and resilient operations:

- **Strategy & readiness.** Maturity assessments, target operating models for hybrid/multi-cloud, and cost/benefit modelling; proportionate GDS compliance and ISO 27001 controls embedded upfront.

- **Design & architecture.** Secure, well-architected patterns across Azure, AWS, and Google Cloud; data platforms, identity and access, and cross-domain solutions for sensitive estates.
- **Build & deploy.** Cloud-native engineering, DevSecOps (CALMR), CI/CD, infrastructure-as-code; automated testing and quality assurance to accelerate safe release.
- **Migration & modernisation.** Legacy transformation, platform reviews, and workload migration tuned to resilience and cost; pragmatic FinOps to keep spend predictable and efficient.
- **Operate & optimise.** Observability, incident management, performance tuning, backup/restore, and change management, maintaining business continuity and reducing total cost.
- **Client-side delivery assurance.** Forward-looking, risk-based assurance that keeps complex programmes on track, covering governance, architecture, testing, migration, service readiness and cutover. See our *IT Delivery Assurance* service.

### 1.5.3AI, ML and data (from strategy to scale)

- **Strategy & governance.** AI blueprints, operating models, and policy; enterprise data governance; regulatory readiness; centre-of-excellence setup and change adoption.
- **Engineering & MLOps.** Data platforms on Azure/AWS/GCP, pipelines and feature stores; robust ML lifecycle with monitoring, drift detection and auditability.
- **Generative & agentic AI.** Secure integration of LLMs (including Copilot) into workflows for measurable productivity and quality gains, using guardrails, system cards and ROI framing.
- **Responsible AI.** Lifecycle controls and assurance tooling to manage bias, security and transparency.

#### 1.5.3.1 Quantum and emerging technologies

PA's applied physics and quantum engineering teams help clients unlock near-term value, combining quantum techniques with classical systems for decision support, advanced sensing and secure communications:

- **Decision support & optimisation.** Hybrid quantum/classical algorithms to accelerate complex planning, routing and resource allocation where speed and quality of decisions matter.
- **Quantum sensing & RF.** Novel quantum radio and Rydberg-based sensing to enhance spectrum use, detection sensitivity and resilience in contested environments.
- **Commercialisation insight.** Advisory at the "whole-stack" level, hardware, supply chain, interfaces, and ethics, to move from lab to market within national strategies.

These capabilities are industrialised at our Cambridge centre, turning concepts into robust prototypes and pre-production systems across sectors like defence, energy and transport.

### 1.5.4Cyber security and digital trust

Digital trust is central to PA's approach. We design security into architecture, operations and culture, aligning to NCSC CAF and GovAssure, and delivering testing, red-team, SOC design and OT/IoT security:

- **Transformation & architecture.** Secure-by-design patterns, cloud security, identity, and cross-domain data protection (including NCSC-approved Oakdoor data diode products).
- **Assurance & regulation.** CAF/GovAssure alignment and pragmatic remediation plans for government organisations.
- **Testing & resilience.** CREST-aligned penetration testing, red-teaming, incident readiness, and operational resilience.

## 1.5.5What PA will bring

**Ideation & Strategy**

- Cloud strategy and advisory services
- Cloud readiness assessments
- Cost/benefit and ROI modelling
- Security and compliance by design.
- AI/ML and data strategy (blueprints, operating model, governance) with Responsible AI policy and guardrails.
- Quantum opportunity framing and whole-stack commercialisation roadmaps.

**Design & Architecture**

- Bespoke enterprise and cloud architectures
- Integration with existing IT infrastructures
- Hybrid/multi-cloud design
- Continuity and disaster recovery
- Data platforms and MLOps patterns
- Security, privacy and resilience embedded by design in technical designs
- User-centred-design
- Secure cross-domain solutions and high-side/low-side integration where required.

**Development & Deployment**

- Cloud-native engineering
- Containerisation, microservices and serverless
- DevSecOps (CALMR) with CI/CD and automated testing
- Generative AI and Copilot enablement with measurable productivity outcomes and run-controls.

**Implementation & Migration**

- Data migration and legacy modernisation
- Vendor selection and management
- Infrastructure-as-code with progressive, low-risk cutover.

**Operations & Management**

- Observability, incident management, SIEM/SOC design
- Performance optimisation and cost management (FinOps)
- Backup/restore
- User training and change adoption.

**Innovation & Scaling**

- Scalable cloud infrastructure to support growth
- AI/ML implementation and scaling
- IoT integration
- Ongoing innovation sprints and R&D, supported by our Cambridge engineering labs for rapid prototyping and pre-production.

## 1.5.6 PA is fully equipped to manage any challenges or requirements you may present

Across strategy, design, build and run, PA blends independent advice with hands-on engineering, operating to ISO 27001 and UK government standards, and backed by hyperscaler partnership depth. Whether the brief is modernising a sensitive cloud estate, industrialising AI responsibly, or de-risking a quantum-adjacent programme, we bring the multidisciplinary team to get from idea to reality, safely, quickly, and at scale.

# 1.6 A Genuine commitment to Social Value

At PA, we believe in the power of ingenuity to create a positive human future. Central to this ambition is our commitment to developing high-quality opportunities that enable individuals to acquire leading-edge skills, all within an environment that supports personal wellbeing and growth. We invest in our people through comprehensive training and development, ensuring they are fully prepared to tackle our clients' most complex challenges and advance their own careers.

We recognise that diversity drives innovation. Therefore, our recruitment practices are inclusive, welcoming individuals from all backgrounds. Every member of our team is empowered to reach their full potential through inclusive policies, processes, and a culture that is continuously improved using robust data.

We are passionate about creating genuine opportunities for those facing significant barriers to employment. Since 2023, our Digital Apprenticeship Programme has offered a Digital and Technology Solutions Degree through the University of Roehampton or Northumbria University. Our apprentices typically include first-generation professionals, college leavers, and individuals from ethnic minority

backgrounds, many living in deprived areas. Additionally, we offer summer internships for undergraduates entering their final year, hosted at both our central London office and the Global Innovation and Technology Centre in Cambridge.

Economic responsibility is integral to our purpose. PA is accredited as a Living Wage employer, and where relevant, we ensure that our suppliers and subcontractors are paid at least the minimum living wage. We are also a signatory to the Prompt Payment Code, demonstrating our commitment to fair and responsible payments to suppliers.

Our carbon reduction targets have been validated by the Science Based Targets initiative (SBTi). We have a published carbon reduction plan and are committed to achieving carbon net zero by 2040, in alignment with PPN 06/21 criteria for UK public sector contracts exceeding £5 million. In 2024, we achieved a silver EcoVadis rating, reflecting our ongoing progress in sustainability.

We are dedicated to delivering targeted social value and will collaborate with you to determine the most effective approach for you, ensuring our efforts have the greatest possible impact.

## 1.7 Security Clearance

PA are fully compliant with industry best practices for information security, which includes compliance with the UK MOD Industry Personnel Security Assurance (IPSA) standard, against which we are independently audited every three years. PA also has multiple sites with FSC (previously List X) where our dedicated in-house Security Vetting team are based. This allows PA to achieve security vetting of its employees in a time effective manner ensuring the correct processes are always followed (In accordance with the Security Policy Framework/GS007). As a matter of standard process, PA puts all its eligible employees through the Baseline Personnel Security Standard (BPSS), set out by the Cabinet Office. Those employees working on, or planning to work on, government projects are automatically put forward for SC clearance which are processed via UK-SV (formally the Defence Business Services – National Security Vetting). PA also process DV vetting through the UK-SV and other agencies, these are generally client sponsored.

PA currently have a large pool of cleared individuals (80% of UK Staff). Should a resource be identified where clearance is needed, the PA Security Vetting team will then process the individual through the relevant clearance procedure. The team will also be able to validate all existing clearances held by PA employees when requested.

## 1.8 Next Steps

This service is intended to help customers develop and deliver successful outcomes regardless of the life cycle stage they are at. PA prides itself on working with clients and helping them to deliver outcomes whilst also providing them the ability to ‘stand on their own’ so that they can move their solutions forward without future involvement. Please contact us on GCloudFramework@paconsulting.com to discuss your needs further

## About PA.

We believe in the power of ingenuity to build a positive human future.

As strategies, technologies, and innovation collide, we create opportunity from complexity.

Our diverse teams of experts combine innovative thinking and breakthrough technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

We are over 4,000 strategists, innovators, designers, consultants, digital experts, scientists, engineers, and technologists. And we have deep expertise in consumer and manufacturing, defence and security, energy and utilities, financial services, government and public services, health and life sciences, and transport.

Our teams operate globally from offices across the UK, Ireland, US, Nordics, and Netherlands.

## PA. Bringing Ingenuity to Life.

Discover more at paconsulting.com and connect with PA on LinkedIn and X.

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