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Integrating Capabilities for the Cloud using FCCM

GCloud Service Description Document

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Integrating Capabilities for the Cloud using FCCM

1.1 Short Service Description

Integrating Capabilities for the Cloud using FCCM service brings the required technical perspective to enable *Integration by Design*, especially through the inclusion of open architectures. Our Integration Advisors help programmes to take a holistic, architectural, systems view of interactions, dependencies, using the Defence Capability Hierarchy to deliver mission digital capabilities.

1.2 Key Service Features

1. Customer Friend to Programme Director and team on Integration
2. Delivers end-user focused, cost effective and innovative integration advice
3. A solution and vendor agnostic approach.
4. Brings knowledge to accelerate and navigate the acquisition processes
5. Provides DCH/FCCM experienced Capability, Systems Engineers or Architects
6. Delivers capability solutions built around a digital architecture backbone.
7. Can generate/assure a Design Authority (DA) of various artefacts
8. Supports Programme Director/Manager in both the Run and Change.
9. Acts as an extension of a DA or similar
10. Integration requirements, design, strategy and architecture

1.3 Key Service Benefits

1. Sets programmes for success by anticipating assurance/approval requirements.
2. Solution and vendor agnostic, end-user focused, innovative solutions.
3. Equipping with holistic view of capabilities and Force Elements.
4. Ensures required assurance artefacts are generated and sufficient.
5. Develops and leverages relevant strategies for digitisation
6. Helps successful delivery of integrated solutions considering DA recommendations
7. Helps to successfully navigating integration scrutiny/approvals.
8. Knowledge transfer of DCH/FCCM and Systems Integration best practice.
9. Helps to design coherent capabilities for digital integration.
10. Technical understanding of applicable standards, especially LOSA

1.4 Service Definition

The Integration Advisor role for programmes is an extended level of support to assist the development of Vision and Capability Requirements with a particular focus on Mission Engineering, Mission Systems Integration and end-to-end capability and system design based on the Defence Capability Hierarchy (DCH) and Force Centric Capability Management (FCCM). The goal is to implement the principle of '*Integration by Design*' as proven with the British Army in line with the Mission Systems Integration (MSI) Strategy.

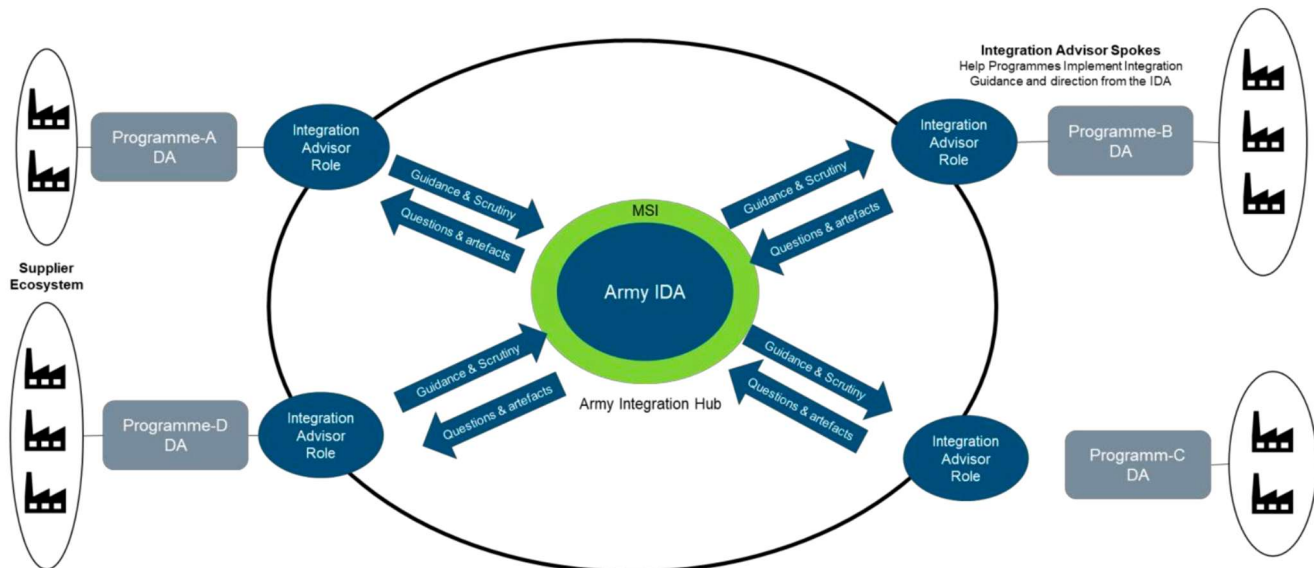


Figure 1: Illustration of the Integration Advisor Role using an Army FLC example.

By defining and planning Capabilities and their Capability development/delivery programmes to *Integrate by Design* it will bake-in all the benefits that arise from Mission Engineering at the outset thus setting the conditions for realising the benefits of integration, at pace, across the Force as other new programmes adopt the approach.

The Integration Advisor role turns Mission Engineering and MSI from concept into the delivery of tangible benefits and this role and the type of specialist advice given and resulting value can be replicated in other programmes during their pre-concept and concept phases and beyond into delivery. This accelerates the delivery of the MSI Strategy, its benefits and objectively ensures that future capabilities are fully interoperable, helping to deliver strategic goals, e.g. Multi Domain Integration (MDI), Digital Targeting Web (DTW).

The Integration Advisor role works directly to the Programme Director but also operates under the guidance of the Design Authority (DA). The role is considered an embed in the Programme Director's Office/team from the DA. Thus, it has a dual reporting chain:

- To the Programme Director – taking direction from and delivering outputs as directed to meet the outputs and outcomes of the programme plan. This is the primary reporting chain.
- To the Design Authority – to provide the Integration Assurance function on behalf of the DA. This essentially forward deploys the role into the programme but enables continued oversight of the Assurance activities by the Core DA team. Assurance activities will be proposed by the DA and scheduled in consultation with the Programme Director to align with and complement the programme plan.

The Integration Advisor will coordinate any integration issues affecting Force Design with the DA, escalated formally if necessary. This should not preclude normal collaborative working between elements of the DA, internal functions, and the Integration Advisor to avoid the need to escalate.

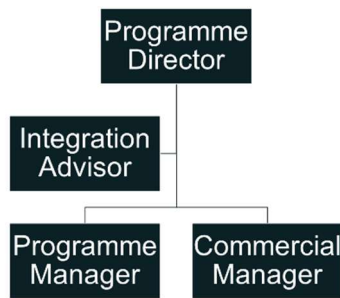


Figure 2: Integration Advisor is DA-deployed to sit between Programme Director and P3M/Commercial

1.4.1 Integration Advisor Role Purpose

- The Integration Advisor role takes a customer centric approach – it acts as the Customer Friend to the Programme Director and their team on Integration matters.
- It takes a solution and vendor agnostic approach to deliver end-user focused, cost effective and innovative integration advice and solutions.
- It accelerates the acquisition process and delivery. The role possesses the knowledge to accelerate and navigate the acquisition processes, tailored to a rapid and agile delivery environment.
- It is independent, technology agnostic and focused on exploiting existing and new links with the wider Defence, Security and technology and supplier ecosystem to solve problems, in terms of both expertise and equipment supply.
- Supports the Programme Director/Manager in both the Run and Change aspects of the programme, developing and leveraging relevant strategies, and enabling establishment of appropriate Infrastructure and Supply Chain to support integration throughout the life of programme.
- It acts as an extension to the DA providing forward deployed expertise to help with the delivery of integrated solutions acting on recommendations from the DA and helping the programme successfully navigate integration scrutiny as part of programme approvals.
- It aids knowledge transfer of DCH, FCCM, MSI, Mission Engineering and Systems Integration best practice to the FLC and as they continue to evolve as an Intelligent Client.

1.4.2 Integration Advisor Role Responsibilities

Integration Requirements:

- The development of a programme vision with integration through digital architecture at its heart, ensuring integration is considered as a critical enabler (such as Safety and Cyber) from the outset.
- Provide and overarching roadmap with integration at its heart.
- Provide an overarching and holistic view of the requirements, design, and solution options for delivering an integrated architecture, ensuring coherence with the Integration Strategy and Industrial/other Strategies to deliver an integration architecture that is truly realisable in collaboration with Defence's Industrial base and ultimately satisfying the Integrated Procurement Model.
- Ensure and assure the delivery of Integration Requirements to satisfy the roles and capabilities effectively and efficiently in accordance with the DCH/FCCM.
- Provide assurance to the DA that the programme integration requirements are coherent with other capability integration requirements in the FLC and across Defence, especially

accounting for MDI. Ensuring that integration requirements will support Force Outputs and be driven by Capability not just platform requirements, i.e. that it is Force Centric by Design.

- Provide assurance to the Programme Director that the Integration Requirements conform to MSI Strategy and Mission Engineering guidance.
- Collaborate with and provide guidance to the Delivery Agencies and the Industrial base on the Integration Requirements helping to ensure common understanding and interpretation and the generation of realistic solution options that implement the Integration Architecture.

Integration Architecture and Design:

- Ensure and assure the development of an Integration Architecture for the programme and supporting Mission Systems. Both a logical and physical architecture as the programme progresses.
- Provide assurance to the DA that the integration architecture is coherent with Integration Strategy and with the wider Digital Architecture and Strategy. Ensuring pan-FLC capability coherence through the application of Design Authority Governance.
- Ensure and provide assurance that the programme is designed coherently for the integration of Mission Systems that will provide an optimal mix of platforms and roles to satisfy the requirement of the Force Elements.

Integration Standards:

- Understand the integration and open system standards that are applicable to the programme architecture.
- Ensure and assure that relevant integration standards are reflected appropriately in all levels of requirements and design documentation (both logical/user and physical/system) to drive suppliers' implementation of Open Architecture Solutions in accordance with Strategy.
- Work closely with the standard setting bodies and industry to ensure that the applicable integration standards are fit for the purpose of the programme and Mission Systems. Request, direct and coordinate changes to standards as required working with the standards bodies.
- Ensure that test strategies are developed and implemented to verify vendor compliance to required standards. Develop mitigation strategies if needed to address any shortfall in standards compliance and ensure this in accordance with DA Governance.

Integration Assurance, Validation and Verification:

- Working with or on behalf of the DA, ensure requirements and logical and physical designs are validated to ensure they appropriately address integration in accordance with the MSI strategy and the needs of the Force Element roles that the programme will equip.
- Work with all elements of the programme team to maintain an appropriate level of Integration Maturity (which will be independently assessed by the DA) to actively manage integration plans.
- Working with the DA to ensure that platform and the mission systems to be integrated are validated for compliance to applicable integration standards and meet the integration requirements.
- Work with the DA, suppliers, and the industrial base to develop mitigating solution options to any integration shortfalls focussing on approaches which will not compromise the delivery against the MSI Strategy.
- Represent the Programme manager to witness and sign-off any testing relating to integration at all stages of the programme.

Commercial Integration Assurance:

- Provide integration insights into the Commercial function.
- Provide assurance to the Programme Director/Manager that the contracts enable all aspects of integration (from infrastructure through to installation) and support agile-/outcomes-based approaches.

Other:

- Ensure a viable industrial ecosystem is developed to support the integration of Mission Systems onto the programme. Including working in accordance with any Industrial Strategies, with Delivery Agencies, and direct with suppliers to ensure there is adequate supply and a competitive commoditised market for components that enable Mission Systems Integration (e.g. the GVA family of components). This should be done in conjunction with the DA.
- Ensure an adequate environment is established to objectively test integration for the programme solutions through life from concept to delivery and support.
- Support the Programme Director/Manager in the selection of an Integrator for the programme and as required.
- Monitor the realisation of the business case and course correct as necessary to ensure Return on Investment (ROI) on integration investments.

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.

1.5.3 AI, 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.

1.5.4 Cyber 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.

1.5.5 What 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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