



Crown
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Service



Intellectual Property Verification

GCloud Service Description Document

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Intellectual Property Verification

1.1 Short Service Description

Intellectual Property (IP) Verification addresses the issue of dependence on suppliers for provision of a service. We review the IP in the service and improve the quality of the IP so that a professional engineering firm would feel that the risk of taking on that IP was manageable.

1.2 Key Service Features

1. Direct access to 250 engineers to review the IP
2. Access to an IP team covering several sectors
3. Set of 'gold standard' templates capturing IP of a service
4. Raise the quality of IP to minimise the risk

1.3 Key Service Benefits

1. Significantly reduced cost and better service model through competition
2. A better understanding and description of the product or service
3. Higher quality IP leading to improved maintenance and service
4. Reduced risk premiums and more confident bidding
5. Fewer misunderstandings, better service provision and improved performance

1.4 Service Definition

Outsourcing the development of a Cloud-based or server-based system is a common approach to use the skills and capabilities of third parties. The resulting product or service can be used for many years by the client generally with the support of the original third party, as this is where all of the knowledge and understanding of the Intellectual Property (IP) that makes up the product or service resides. Consequently, it is very difficult to separate from the third party should any under-performance or breakdown in the relationship occur. In addition, there is little incentive for the third party to remain cost competitive, and there is little or no way for the client to create competition to provide the product or service, as no competitor will have access to, or the deep understanding of, the underlying IP.

IP Verification is a service designed to address this issue. We work with client and third party to understand at a deep level the IP in the product or service. We measure the third-party IP against our expectation of a 'gold standard' of what the IP should consist of and then work with the third party to improve the quality of the IP to the point where a professional engineering firm would feel that the risk of taking on that IP was manageable. We then support a re-procurement of the product or service so that a competitive market is created and the client is able to access the best possible service for the most economic cost.

For example, we did this for Transport for London, where the incumbent supplier of the Oyster system had developed all of the IP for the service and it was therefore viewed that there was no realistic chance of creating a competition for supply of the service when it came up for renewal. On TfL's behalf, PA reviewed the IP of the 130 parts of the Oyster enterprise system and raised the quality of them to the point where other suppliers were willing to enter a competition to provide the service, without applying a disproportionate risk premium. TfL have stated that this will save £100m over the 10 year duration of the service.

Based on what we've learned from our work with clients, IP Verification covers four key steps:



1. Characterise the IP

In order to characterise the IP in question we work with the client to 'modularise' the system of interest – that is to say we build a system architecture of 'modules' which form the key components of the system and the interfaces with them. These form an unambiguous description of the system and, once modularised, the module breakdown typically becomes a nomenclature used throughout. As the IP is commercially sensitive, we then create a secure storage area for the IP, creating a baseline of the IP. This baseline of IP is then updated periodically as the supplier improves the IP. Working with the client, we then select verification levels (and therefore the amount of planned effort) for each module in the system. This allows clients to prioritise mission critical or complex components above obsolete or peripheral components and therefore maximise value for money. PA already has a set of 'gold standard' templates for what we would expect to see for electro-mechanical devices, enterprise software (including cloud-based software), business processes and communications systems. If necessary, we will build other templates for new components.

2. Verify the IP

For each module, we work with the supplier to understand the context, status and history in a mobilisation meeting. This allows us to place the IP into context and understand where any gaps may be. For each module, a team of professionals, expert in the technical disciplines of the module review the IP against the gold standard. Depending on the verification level, this can be an in-depth search or quick scan. By its nature, the IP development may be in-progress or may be legacy. We work with the supplier to clarify any obvious issues and to understand and place these into context. Each module is summarised in a report that explains its status and any gaps in the IP compared to the gold

standard. This provides clients with a clear baseline as to PA's opinion as to the quality and completeness of the IP for each module.

3. Improve the IP

Based on the verification exercise, we summarise the core issues in a database. We work with the client to prioritise issues and we brief the supplier on the nature of the issue and the action we expect to see in resolution. As the supplier provides issue resolution, we will review the issue and either request further action if it remains unresolved or close the issue as appropriate. We maintain the issues database according to the current status of the issues so that everyone has an up-to-date understanding of the status and outstanding actions. If significant changes have been made to the IP describing a particular module, either due to time passing, or due to issue resolution, the client may request a reverification of the module to raise the baseline to the appropriate level.

4. Support the procurement

As PA has examined all aspect of the system in detail, we are now in a unique position to capture the requirements that will form part of the retendering process. We also advise on how the IP transfer should be incorporated into the contract, although not acting as legal advisor. We also provide wider procurement advice and project management of the procurement itself. To provide a fair competition, we have created a digital bidders' data room that allows bidders access to the IP in a controlled fashion. We will prepare and maintain this. Typically, at this point there are only three organisations in the world that know the IP well – the supplier, the client and PA. We therefore act as an independent expert, answering questions from bidders on the IP and system generally, providing neutral support.

5. Provide ongoing support

After the contract has been awarded, the IP is likely to evolve over the duration of the contract. It is therefore important that the IP is maintained at a high level of quality so that any subsequent re-procurement has the same benefits. We therefore provide enduring support for the duration of the contract, reviewing contract variations and ongoing maintenance and development of IP both to make sure that it is consistent with the contract and also to make sure that the quality of the captured IP remains at a high level of quality.

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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