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Asset Management: Outcome Focused Information Requirements

GCloud Service Description Document

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Reference: PA RM1557.15

Version: 1.0

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Asset Management: Outcome Focused Information Requirements

1.1 Short Service Description

Asset intensive organisations hold vast quantities of data and only use a small percentage of it to deliver value through insight. We provide an outcome-based approach to defining asset data requirements that drives efficiencies in data capture and transformation as well as delivering actionable insight for better, more consistent decisions.

1.2 Key Service Features

1. Outcome-based approach to information requirements
2. Harnessing the power of analytics turning data into insight (Dark-Data)
3. Proving or disproving hypotheses for actionable insight
4. Building consistency into decision making through enhanced information
5. Using Plain Language Questions to develop Information Requirements
6. Alignment with industry standards: Building Information Modelling (BIM, PAS1192)
7. Creating a framework for data quality measurement and improvement
8. Targeted data gathering through digital means and Common Data Environment
9. Driving data culture improvement through trust, tools and process
10. Creating and communicating a clear information Strategy to all stakeholders

1.3 Key Service Benefits

1. Outcome consistent presentation of actionable insight
2. Improved and expedited decision making
3. Data culture improvement
4. Improved data quality and trust
5. Time saved through not debating data integrity
6. Reduced data gathering (gathering the right data)
7. Improved access to data and insight
8. Reduced data storage and transformation needs
9. Improved collaboration
10. Enhanced line of sight and therefore understanding of purpose

1.4 Service Definition

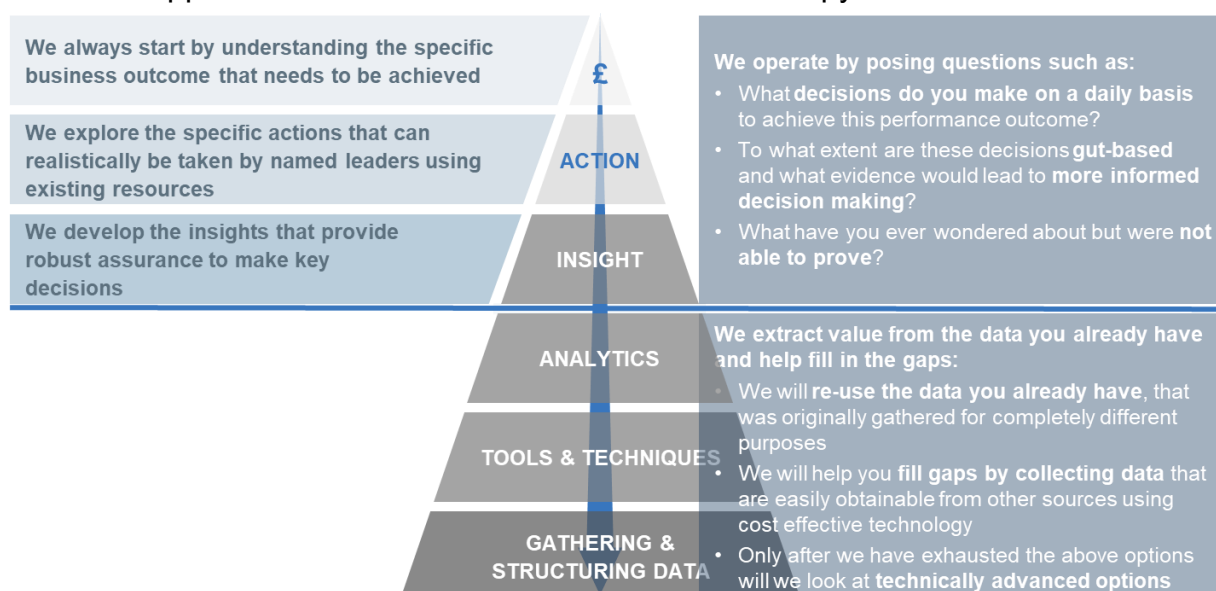
1.4.1 Our Approach to developing Outcome focused Information Requirements within your organisation.

At the heart of the most sophisticated and successful asset intensive organisations is a clearly defined, well-structured and accessible information architecture that enables the development of actionable insights leading to better decisions and therefore outcomes.

This capability does not happen overnight, and many organisations spend huge amounts of effort gathering vast amounts of data that is either not used or in some cases not even known about. In PA, we use a novel approach to the definition of information requirements through the use of outcome-based insight generation. This means that the data that is gathered is gathered for a reason and is therefore in an appropriate format to be combined with other sources of information to provide insight.

Actionable insight is incredibly important in enhancing decision making providing consistency in justifications, and also providing an audit trail upon which future learning can be achieved.

We centre our approach around a common model – the value pyramid:

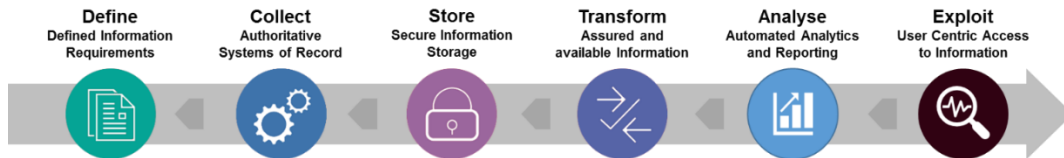


This model allows us to focus on all elements of data value including the specification and means of gathering of data, the application of tools and techniques in developing insights, understanding the impacts of proposed actions and supporting evidence-based decisions, and, ultimately, reaching the desired outcomes.

We always start with the outcomes as this is what aligns to the business purpose and guides the development of proposed actions, insights required to decide on specific actions, analytics through tools and techniques required to generate the insights and then the data itself (information requirements, gathering process, use of digital means, data transformation etc...)

Developing a clear set of information Requirements

Starting with outcomes, we can begin to understand the questions that we need to answer. Best practice is to develop a list of Plain Language Questions (PLQs) that are geared towards understand if a desired outcome is or isn't being achieved. This can be completed at varying levels in a hierarchy that results in a defined set of Asset Information Requirements (AIRs) – it is these information requirements that create the foundation for the processes that will gather and store the information in a way that allows it to be transformed, analysed and ultimately exploited through actionable insight.



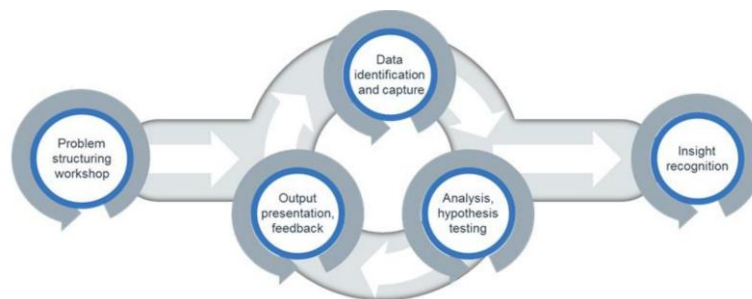
PA can help asset intensive organisations across the full information value chain including the definition of outcome-based information requirements, the complex data architecture and technology suite required to enable each stage, the communication and engagement that will drive a data culture.

Using insight for performance improvement

Where the outcomes are known and performance is unsatisfactory, this method of insight generation through the testing of hypotheses allows our data scientists and analysts to home in on root causes of problems providing the insight required to make the decisions that will change the outcome.

If the data and insight does not lead to a different or better decision, why gather the data, transform it and analyse it in the first place

We use a simple structure to understand the hypotheses at play and the actions that could be taken should the hypothesis be proven or disproven:



Think Big, Start Small, Scale Fast

In developing the capability to exploit outcome focussed information requirements, we will help you to break down the challenge into more manageable areas. We would do this by looking at different Asset Classes or Asset Systems that have the greatest relevance to the outcome in question. It is important to note that assets on their own do not often deliver the value to the organisation – it is the combination of asset into asset systems that is important and therefore we can also draw conclusions around criticality of individual assets

Driving Data Quality

A documented, agreed set of information requirements in a data standard should be communicated in a way that helps gatherers and users of data to understand the importance of it. This, in turn, will drive the improvement of data quality and completeness. Once the Define stage of the Information Management Value Chain is robust, the collection, storage and transformation of data should be focussed on the four elements of data quality management:

- Completeness
- Accuracy
- Reliability
- Timeliness

Additional Considerations for robust outcome-focused information:

- A documented Asset Information Strategy will be a live document kept up to date in line with the expansion of asset classes and the overall increasing AM maturity of the organisation.

- Analytics reporting capabilities will grow with the sophistication, completeness and quality of the dataset – opting for the most advanced tools first will slow progress
- Robust data sets can be exploited through the development and deployment of asset management technologies including real-time measurement and display through digital twins
- An assessment and review of the information architecture and functionality enterprise systems will be required to ensure that information can be exploited across an enterprise asset management system (EAMS)
- Accessibility is a critical element – access to self-service insight and use of interactive tools enhance the user journey, develop a curiousness and drive greater collaboration across the enterprise

Where information is shared/accessed by multiple third parties, development and implementation of a Common Data Environment (CDE) will improve the quality of data sharing preventing duplicated and conflicting information

1.4.2 Our Outcome Focused Information Requirements Track Record includes:

Better informed investment decisions: Understanding cost and faults & defects hypothesis development and testing.

The Defence Estate is vast containing assets of varying age, construction and use. Due to a historic reactive and therefore inefficient approach to investment, the estate is in a declining condition. The required investment is not sustainable and therefore careful decisions are required to maximise the opportunities for a better Defence estate.

Asset management decision making relies on having an understanding of cost, performance and risk and optimising between these three competing factors.

As part of the DIO Asset Management improvement Programme, PA used its tested value pyramid approach to create a simple analytical framework that could be used across wider Defence stakeholder working groups.

This enabled PA to collate a common set of hypotheses associated with 'Understanding Cost' and 'Faults & Defects', which, when tested, would lead to the production of valuable insight to better inform annual decision making. These hypotheses were created via collaborative workshops involving stakeholders from not only DIO but also the Front-Line Commands and Defence Head Office.

This is a step change in how DIO have historically approached the production of insight. By targeting specific insight to answer bounded questions rather than continuously processing data into reports that are not acted upon, DIO will be able to provide stronger evidence to better inform its customers leading to better decisions and improvements across the Defence estate.

The hypotheses were split up into three categories relating to availability of data, complexity and stakeholder priority. This enabled the validation/ nullification of certain hypotheses, thus enabling stakeholders to make more informed decisions relating to their asset infrastructure.

PA collaborated with DIO's data analytics and insight team to initial outputs that have created a thirst for greater depth of understanding across all key stakeholders. Having

created the consistent approach, the development of further insight can now follow a similar structured path.

From incidents to insight: Reducing traffic congestion using 'dark data' insights

Highways England's traffic officers look after motorways and major trunk roads, clearing accidents and breakdowns to keep traffic flowing smoothly. They wanted to improve the number of times they cleared incidents in under one hour: a standard not achieved for nearly 7,000 incidents a year. To understand this issue – and work out how to address it – we worked with Highways England to turn their 'gut instincts' about the problems into powerful and tailored organisational insight.

Working with Yorkshire and Northeast region, we found completely new ways to use their data. By focusing on their hypotheses, we initially confirmed long-held hunches on performance variation. We established up to a 10 per cent performance drop at specific times over a patrol shift. We then established the root cause from data collected every day but not looked at before for this purpose. The problems stemmed from travel times for traffic officers at specific times of day. Using this insight Highways England could optimise the way they deployed officers from new and existing base sites.

These changes cut clear-up times by up to 15 minutes per incident, allowing over 100,000 more hours for other key operational activities. Nationally, patrols could hit the one-hour target in up to 2.5 per cent more cases. What's more, we estimate the time motorists would no longer spend in motorway tailbacks could be worth £17.3 million a year to the economy. We have since worked with other Highways England regions to rollout this insight to roll it out nationally and to build on this success.

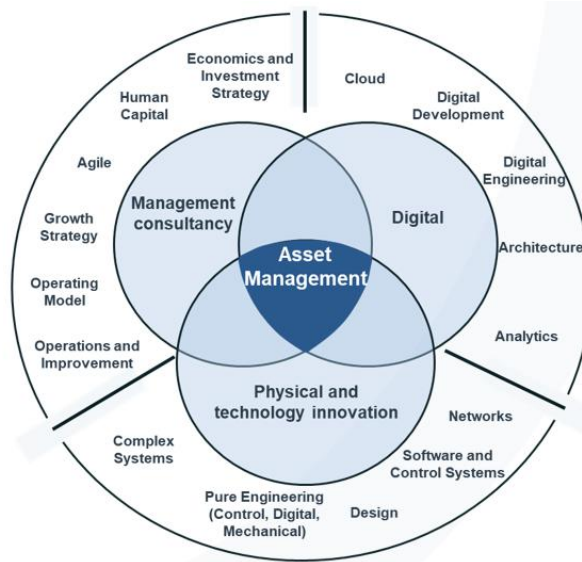
1.4.3 Our People | We deliver end-to-end innovation through ingenious collaboration.

Clients trust us to combine their experiences with our own ingenuity. Our offer is more complete than that of any other single consultancy:

We offer management consultancy to drive and release change, to shape bolder organisations and to develop the capabilities of talented people. We offer digital consultancy to get the most from a technology-driven world through data analytics, digital twin thinking and smarter system architecture.

We offer physical and technology innovation to lift our thinking off the page and into the real world. It enables us to literally bring our ingenuity to life, leaving our clients with working solutions, not reports. We are a cross-sector capability and are experienced both client and regulator side counsel.

We bring the best of PA's knowledge to every conversation and challenge, across strategy, digital, transformation and analytics.



Our offer diagram

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.

1.5.4 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.

1.5.5 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.

1.5.6 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.

1.5.7 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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