

Service Definition Document for G-Cloud 15 Services

Advanced Analytics & Machine Learning Service

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1 Service Definition for Advanced Analytics and Machine Learning Services

1.1 Introduction

This is the Service Definition Document for NTT DATA UK Ltd (NTT DATA) Advanced Analytics and Machine Learning services on the G-Cloud Framework. The information provided in this document is required by the G-Cloud framework and is designed to help clients determine how these services can meet their requirements.

1.2 Overview of services

The following services are designed to help clients to plan and implement their chosen Advanced Analytics and Machine Learning;

- Advanced Analytics and Machine Learning – provides provide a complete range of services across the advanced analytics and machine learning lifecycle. These include iterative experiments, provisioning cloud infrastructure to support AI teams, improving organisational literacy around AI and establishing ML Ops capabilities. AI techniques covered include cognitive techniques such as data/text mining, sentiment analysis, pattern matching, computer vision, statistical techniques such as forecasting and regression simulation, network analysis and machine learning.
- Analytics Data Architecture – provides a cost-effective method of defining, clarifying or providing a detailed assessment of your data architecture in preparation for creating cloud-based solutions.
- Generative AI – provides prototyping and scale-up capabilities for Generative AI solutions to enable departments to realise long-term value from Generative AI - considering maintainability, governance, ethics, and end-user adoption. The service includes operating models and enterprise architecture patterns which allow prototypes to be industrialised.

2 Service Descriptions

2.1 Advanced Analytics and Machine Learning Service

2.1.1 Introduction

The NTT DATA Advanced Analytics and Machine Learning Development Service provides a complete range of services across the advanced analytics and machine learning lifecycle. The service covers all categories of analytical solutions:

- Descriptive Analytics – developing clarity on ‘what happened’ through identification of key indicators.
- Diagnostic Analytics – identifying the correlations between key indicators to explain ‘why it happened’.
- Predictive Analytics – utilising a variety of mathematical, modelling, mining and machine learning techniques to forecast future events based on recent and historical data.
- Prescriptive Analytics – going beyond prediction by also making recommendations on the actions to benefit the predictions.

2.1.2 Approach

In delivering this service we utilise the following methodology;

1. Define objectives

This is a crucial stage for any analytics. Involving key business stakeholders in agreeing the business problem and defining the objectives and success criteria for the analytics is vital. Failure to get alignment at this stages poses significant risk that any analytical outcomes will not be adopted by the business or will not translate into business value.

2. Develop hypotheses

Identifying the likely causes and possible solutions by speaking with, and observing, individuals across the business and reviewing the current business processes. This enables the identification of the key variables required in order to test the hypotheses.

3. Identify data sources

Having identified the key variables required to test the hypotheses, the next task is that of identifying the most suitable, and available, sources which can provide enough historical data to enable the hypothesis testing. This data may be internal and/ or external data. We will seek to gain access to snapshots of the data required in order to proceed with the analytics.

4. Exploring the data

Before executing advanced analytics, we seek to further develop our understanding by exploring the data through simple visualisations as well as univariate, multi-variate data profiling and sensitivity analysis. We often find that allowing the data to lead the analysis can generate powerful insights by itself and further aids identification of key variables and data issues which may impact the analytics.

5. Building models

We use industry standard tools and languages to enable successful models to be developed and iterated. Part of identifying an optimal model is developing and testing many variations. We often employ tools such as DataRobot that allow modelers to attempt many model variations in parallel.

6. Selecting the optimal solution

Once we have identified the most suitable models, we work with the business to identify which are more optimal given the wider context to ensure that the business can not only understand what is more likely to happen in the future, but also have the ability to influence it. For example, if the requirement of the model is to predict that an individual person will take a particular action, it is only valuable if the principle indicators in the model are factors which can be both understood and influenced.

7. Operationalisation

Few machine learning models are completely static - an optimal model is only optimal at given point in time. We put in place the capabilities to monitor model accuracy and performance, to enable models to be re-trained (either automatically or through sandbox environments), to document model logic and the training datasets used. Depending on the level of investment in advanced analytics, data pipelines may need to be maintained separately to prepare data. This in turn may require a broader data architecture be put in place, subject to the as-is landscape. These are all aspects of operationalisation, and this includes both technology and upskilling civil servant teams if necessary so that models remain useful, cost effective and adhere to the Data Ethics Framework.

2.2 Analytics Data Architecture Service

2.2.1 Introduction

NTT DATA's Analytics Data Architecture Service helps clients assess different technologies and methodologies (including cloud) to deliver an Advanced Analytics capability. We recognise the need for the architecture to be the blueprint of the data environment which supports both the short-term and long-term goals of the organisation. The definition of the architecture must therefore consider:

- The analytics and data strategies – as an articulation of the short and long-term goals of the organisations data and analytics
- Data assets – the source, type, and location of the data to be supported by the analytics architecture
- Analytics capabilities – even advanced analytics covers an expansive set of capabilities not all of which may be relevant to every organisation
- Adaptability, flexibility and scalability – organisations, and technologies are evolving at an increasing pace requiring the analytics data architecture to have the requisite capabilities to accommodate these changes
- Experimental vs productionised analytics – recognising that the architecture needs to provide for very differing use cases across the two

2.2.2 Approach

Our methodology centres around three core stages:

a) As-is assessment

In this stage we capture, or review, the existing analytics data architecture from both a technical solution and functionality perspective. We do this through a combination of techniques:

- Reviewing relevant documentation made available by customers.
- Conducting interviews with key stakeholders including user representatives and subject matter experts.
- Hands-on analysis of the systems, solutions, and capabilities.

b) Requirements capture

We capture the requirements of the future analytics data architecture through interviews and workshops with select business representatives, usually within the data analytics teams. The requirements capture focuses on:

- Functional and non-functional requirements of the analytics architecture.
- Use cases showing how user interactions with the proposed architecture are related to the requirements.
- Cloud hosting requirements. The document can also optionally include:
 - Process diagrams (where the architecture is designed to support part or all of one or more business processes)
 - Process/ data flow diagrams (showing in principle how different parts of the architecture logically relate to each other)
 - Infrastructure recommendations including cloud deployment suitability.

c) To-be definition

Based upon the current as-is architecture and the required capabilities of the cloud-based architecture, we define the to-be analytics data architecture. As a result of having both the as-is and to-be architectures, the to-be definition would include recommendations on steps for transition between the two. We maintain reference architectures which can be used as a starting point for the to-be definition – this approach not only saves cost but also ensures the latest technology trends are considered.

2.3 Generative AI Service

2.3.1 Introduction

The NTT DATA Generative AI Service provides prototyping and scale-up capabilities for Generative AI solutions to enable departments to realise long-term value from Generative AI. The service covers the complete lifecycle of a Generative AI app including:

- Use case selection and refinement
- User story development and user experience design
- Adherence to government ethical and governance guidelines
- Structured and unstructured data sourcing and pre-processing
- Model selection / training and prompt engineering
- Alpha testing and iteration
- Beta deployment
- Operational readiness including a service wrapper

We also provide a Generative AI Maturity Assessment because increasing numbers of government departments have started experimenting with Generative AI but struggle to industrialise their portfolio of solutions causing:

- Data duplication
- Higher costs of duplicated solutions
- Security and governance risks
- Differences in quality of solutions
- A proliferation of toolsets and technologies
- Siloed working
- Lack of scale and constraints on key resources

We can help by:

- Measuring Generative AI maturity to achieve a starting point benchmark
- Aligning Generative AI maturity goals with organizational strategy and ambition
- Defining and delivering a target operating model consistent with the desired level of maturity including process, org design, information security, governance structures and policies
- Defining an enterprise architecture blueprint for deploying new Generative AI applications and delivering this technology readiness in iterations synchronised with operating model roll-out
- Delivering Generative AI literacy training

2.3.2 Approach

In delivering this service we utilise the following methodology;

1. Refine use cases

It is common when working with Generative AI that the technology could be deployed in a number of ways to solve a set of related use cases. The first step is to hone in on an initial use case which is both highly valuable and also lends itself to Generative AI technology – e.g. a RAG architecture.

2. Determine use case in context

This part of approach validates how Generative AI would fit into an existing workflow – either a semi-automated workflow or entirely human one. The workflow can be formally defined or exist informally. Ethical issues are addressed at this stage as well as wireframes if appropriate.

3. Technology selection and development environment setup

Where Gen AI is not well established in an organisation, it is necessary to setup an environment with access to foundation models or specialised LLM training environments. A pre-requisite here is technology selection – we have partner relationships with all the hyperscalers and production references with OpenAI on Azure.

4. Identify and pre-process data sources

In most cases, it is necessary to obtain data specific to the organisation so that Generative AI can use this as a basis for vectorisation or training – or to test the Generative AI app. Part of the pre-processing includes removing personal data and determining the governance issues with using the data for Generative AI. Data sources may be structured, unstructured or multi-modal, depending on the use case. We deploy complementary technologies such as knowledge graphs where necessary.

5. Prompt engineering

This part of the process is iterative to provide get the best out of the Large Language Model. We work closely with end users to determine useful outputs and refine the LLM prompts. At the same time, the other aspects of the application are built – which might involve API wrappers or an end to end user experience. This part of the process forms the start of iterative user testing.

6. Alpha testing

Generative AI apps are tested in production-like scenarios to validate their effectiveness and solicit end user feedback. There is always a user in the loop in the alpha testing phase and often in beta as well.

7. Beta deployment

Beta deployment involves establishing a minimal LLM Ops capability to monitor the solution and, if necessary, retrain / refine the model if the outputs fall outside of acceptable boundaries.

8. Enterprise scale-up

This final step is different: it starts from the assumption that one or more Generative AI applications are already live and considers how to scale the organisation to move from isolated point solutions to and enterprise capability. This involves both technology changes (e.g. to standardise specific tooling – to avoid repeating step 3), process changes (e.g. A/B testing for new foundation models or FinOps), people changes (e.g. assigning a product owner for each Application) and culture changes (e.g. Generative AI education). We have reference models for each of these areas and a maturity assessment process which compares the capability that already exists to that which is needed strategically.

We can define the future operating model, design the necessary processes and policies and implement strategic technology capabilities.

3 Commercial Arrangements

3.1 Parent Company Guarantee (PCG)

Please note that NTT DATA is not able to provide a Parent Company Guarantee (PCG).

3.2 Use of subcontractors and partners

These services are delivered by NTT DATA with support from selected, specialist partners only where required, and with approval from the client in advance.

3.3 Pricing

Please see the Digital Marketplace for the NTT DATA Pricing associated with these services.

3.4 Ordering and invoicing process

Clients will be expected to follow the G-Cloud 15 ordering process as outlined in the Framework's Terms and Conditions. This will ensure that the scope, timeline, and technical requirements are understood, agreed and can be delivered.

Each assignment will then require a formal work order to be raised, which would define:

- The name and contact details of the consumer's representative
- The objective(s) of the work and the Key Performance Indicators
- The amount and type of resource required (number of roles and duration)
- Start and end dates for the project
- The scope and requirements for the project
- The specific technical or business knowledge required by NTT DATA
- Advise whether the project is expected to be carried out on the consumer's premises (in which case location is required), or at NTT DATA's premises
- Expected deliverables, quality levels and acceptance criteria for sign-off

Upon receipt of a work order, NTT DATA will evaluate the requirement and confirm a start date. Once NTT DATA accepts a work order, we will commence work upon receipt of a purchase order.

NTT DATA will operate the following invoicing process:

- For time and material projects and assignments - monthly invoices will be issued in arrears for payment within 30 days
- For fixed price projects and assignments - invoices will be based upon agreed staged payments associated with formal client sign-off of interim or final deliverables. Invoices are issued in arrears for payment within 30 days
- For managed services - Transition Charges based on milestones, with Managed Services Charges invoiced quarterly in advance

3.5 Client responsibilities

The client will provide a Project Manager responsible for the following activities:

- Ensure the organisation is aware that external support is being provided by NTT DATA and that staff and teams are clear about the project, its scope and their roles and responsibilities in it.
- Manage the client personnel and responsibilities for this project.
- Serve as the interface between NTT DATA and all the client's departments participating in the project.
- Administer the Change Control Procedure with the NTT DATA Project Manager.
- Participate in project status meetings.
- Obtain and provide information, data, and decisions within three working days of NTT DATA's request unless a different response time is agreed in writing.
- Review and approve the Milestone achievements.
- Help resolve any project issues and the client deviations from the estimated schedule, and escalate issues within the client organisation, as necessary.
- Provide staff as required to undertake the User Acceptance Testing.
- Ensure client staff are made available for any meetings, interviews, document review and presentations within the proposed timescale.
- Provide client staff able to deliver authoritative answers to questions and clarification requests in a timely manner.
- Provide NTT DATA personnel with suitable office space, other accommodation and facilities that personnel may reasonably require to perform the services required during the project.

3.6 Accreditations

For these services, NTT DATA has corporate membership of the ITSMF, SDI and MCA trade bodies and holds a number of relevant accreditations including:

- ISO 9001 Quality Assurance
- ISO 14001 Environmental Management
- ISO 27001 Information Security Management
- PRINCE2 Practitioner Project Managers
- ISO 20000-1 IT Service Management
- ISO 22301 Business Continuity
- ISO 45001 Health and Safety Management Systems
- Cyber Essentials
- Cyber Essentials+

4 About NTT DATA

4.1 Globally

NTT DATA Corporation is a global IT innovator delivering technology-enabled services and solutions to clients around the world and is a top tier global IT Services provider (reference: Gartner). It employs more than 190,000 people across 70 countries.

For more than 50 years, the NTT DATA Corporation has been successfully providing IT services to a wide range of clients in the automotive, electronics and high technology, energy and utilities, financial services, healthcare and life sciences, insurance, manufacturing, media and entertainment, professional services, public, retail, telecommunications and transportation and logistics sectors.

NTT DATA has significant global coverage across Europe, the Americas, the Middle East, Africa, and Asia Pacific regions.

4.2 In the UK

NTT DATA UK Ltd (NTT DATA) is a subsidiary of the NTT DATA Corporation and is a systems integrator headquartered in the City of London and Birmingham. NTT DATA in the UK is a £400m+ per annum turnover organisation that focuses on supporting clients in:

- Public Services
- Automotive
- Banking and Financial Services
- Education and Research
- Energy and Utilities
- Healthcare
- Insurance
- Life Sciences and Pharma
- Manufacturing and Consumer Packaged Goods
- Retail
- Telco, Media and Technology
- Travel, Transportation and Logistics

NTT DATA has partnerships with a number of leading software vendors and works closely with NTT group companies to provide a wide range of solutions to UK clients.

4.3 How we help our clients

NTT DATA provides a portfolio of services to support every aspect of its clients' business technology life cycle, including:

- Strategy to create competitive advantage
- Implementation with speed, confidence, efficiency, and surety
- On-going management to optimise your assets with the best resource mix and cost
- Evolution to create new opportunities and future-proof your enterprise

NTT DATA helps its clients by building value through the visualisation and realisation of innovation. This involves working in close partnership with clients to:

- Design innovation - create robust IT strategies geared towards optimising business processes and the use of IT and networking concepts along the customer's entire value chain. We help our clients use IT to differentiate themselves from their competitors
- Develop solutions - use our advanced systems structuring and application capabilities to develop and provide solutions that make business innovation a reality
- Drive performance and efficiency - provide constant support for our clients helping them exploit the full potential of their IT solutions and take advantage of the latest IT innovation thinking

4.4 Trade body membership and accreditations

NTT DATA has corporate membership of the MCA trade body and our activities are supported by technical and vendor accreditations:

- Snowflake Global Elite Partner
- Informatica Enterprise Premier Partner
- Google Cloud Platform Premier Partner
- Microsoft Solution Partner Designation: Business Application, Data & AI, Digital & App Innovation, Infrastructure, Security, Modern Work.
- AWS Premier Partner | AWS Partner Programs; Premier Tier Services, AWS Managed Service Provider, Authorized Commercial Reseller, AWS Public Sector Partner, AWS Solution Provider Program, AWS Public Sector Solution Provider, Authority to Operate on AWS
- AWS Competencies | Machine Learning Consulting, Telecom Services, DevOps Consulting, Government Consulting, Migration Consulting
- Salesforce Platinum Partner
- Genesys Global Gold partner
- Service Now Elite partner
- Red Hat Premier Business Partner
- Palo Alto Networks Diamond Innovator (Global)
- Check Point 5 Star Partner
- Fortinet Global Partner
- F5 Platinum Partner
- Zscaler GSI
- Cisco Gold Partner
- SAP Global Platinum Partner
- Dell Titanium Partner

4.5 Services

We support UK clients through the following digital focus areas:

- Customer Experience - engaging with customer to maximise user understanding, engagement and support
- Data & Intelligence - excel in new data model creation using gathered intelligence that can produce actionable results for organisation success
- Intelligence Automation - automate repetitive business processes for success in a digitally-dynamic environment
- Internet of Things - connecting and communicating with an ever-expanding base of devices connected to the internet
- IT Optimisation - revolutionising IT environments by delivering the agility necessary to remain effective in a rapidly changing landscape
- Cyber security - protecting against data breaches and unauthorized use of confidential information in today's connected digital world

4.6 Further information

See <https://uk.nttdata.com> for further information, or contact us at nttdatauk.requirements@nttdata.com