analysys mason

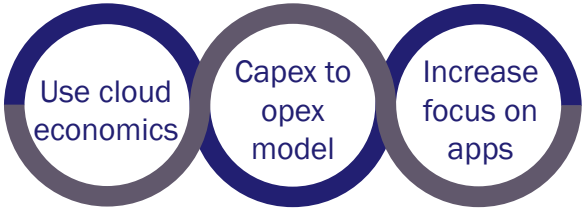
Vodafone is partnering with Nokia to build an anomaly detection application on GCP

Anil Rao and Francesco Paolo Bellomo

RESEARCH

Vodafone's analytics vision and strategy overview

STATE OF THE BUSINESS

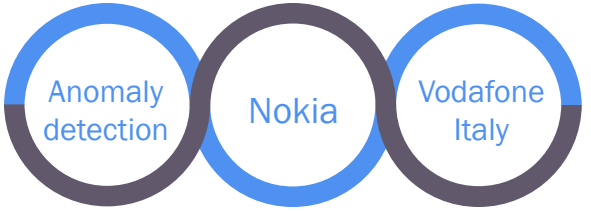


Migrate Big Data Platform to GCP | Use scalability and spread costs | Standardise data collection on GCP

FOCUS OF THIS EFFORT

Insight-driven network lifecycle management | Network and operations efficiencies | Build applications on GCP

PROJECT APPROACH



Prioritised use case | Solutions partner | First OpCo to deploy the use case

BUSINESS DRIVERS

- Vodafone wanted to pivot from being capex-heavy to being opex-friendly.
- It wanted to use Google Cloud Platform (GCP) as the primary data platform and embrace a standard way for collecting data.
- Vodafone plans to increase its focus on delivering business outcomes by developing AI/ML-based intelligent applications with a 'develop once, deploy many times' model.

STRATEGY

- Transform network management using data insights to automate as much as possible.
- Deliver cost and network efficiencies through smarter network capacity optimisation, discovery and troubleshooting.
- Find partners for application development to deliver business value across domains such as the RAN, IT, core network and the Enterprise business.

ANALYSIS

- Vodafone prioritised anomaly detection due to its potential to provide the biggest benefits in terms of network automation.
- It chose Nokia as the solutions partner due to its flexibility and openness for ongoing collaboration and its willingness to jointly innovate and provide the source code.
- It implemented the solution in Italy and is due to roll out in Portugal and elsewhere.

BENEFITS

Easier to deploy and scale new applications across operating companies

Access to global best practices and a joint innovation partner

Anomaly detection delivers efficient network planning, optimisation and operations

Source: Analysys Mason

Business challenges and key drivers of the project

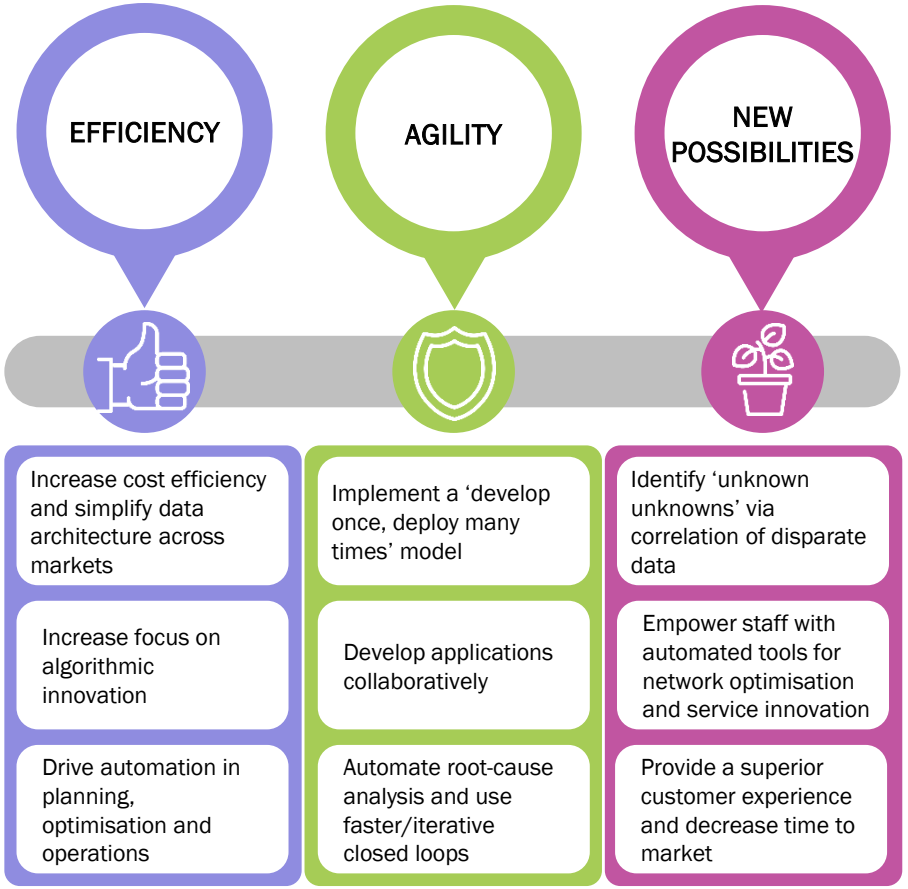
Vodafone's move from its on-premises Big Data Platform (BDP) to Google Cloud Platform (GCP) provided a new opportunity to rethink data management and increase the focus on use cases and application development.

Vodafone's BDP consisted of many different clusters across operating countries, which in turn created multiple 'data lakes' and made data analytics inefficient. The disparity in data across the data lakes and lack of robust algorithms led to undetected network issues and service degradations. Vodafone decided to move to GCP in order to solve these data-related problems by creating a single cloud-based 'data ocean'.

Vodafone also wanted to use GCP to transform its network management and drive cost efficiencies across the business by increasing its levels of automation. To achieve this, Vodafone increased its focus on developing use cases and applications that would be hosted on GCP because GCP allows for easy scaling across OpCos and supports region-specific customisations.

Vodafone needed a partner with strong network and cloud expertise to accelerate the network optimisation on GCP. It also needed the partner to collaborate and co-innovate on the development of use cases and applications. Vodafone chose to partner with Nokia to take advantage of the company's strong history of innovation (through Bell Labs), its deep expertise in RAN and cloud and its partnership with GCP.

Figure 1: Business factors that are driving the transformation project



Source: Analysys Mason

Vodafone partnered with Nokia to develop an anomaly detection application

Anomaly detection is expected to provide Vodafone with significant benefits in the radio domain and forms part of Vodafone's broader goal of delivering network and cost efficiencies across its OpCos.

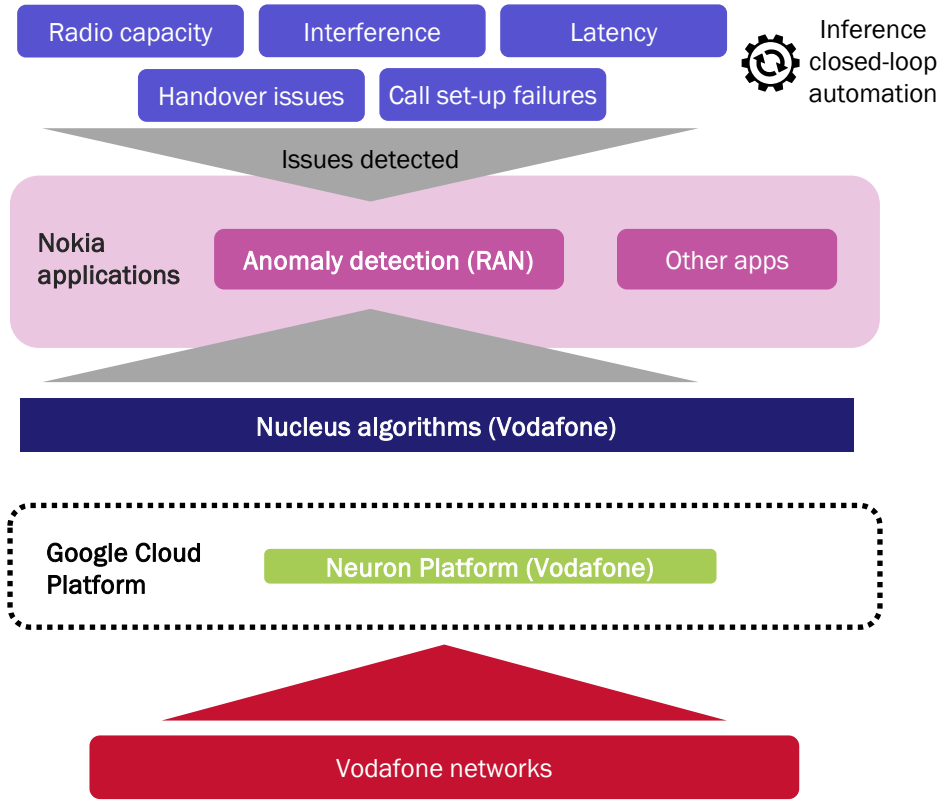
Vodafone is using the anomaly detection use case to support network planning and optimisation with a plan to expand to network operations. It is the first step towards achieving full automation of network lifecycle management. The Neuron platform runs within GCP to render and store the RAN data and the Nucleus algorithms are used for ML-based pattern recognition, clustering and classification (Figure 2).

Nokia developed the anomaly detection application to be consumed as-a-service. It shared its vision with Vodafone and exhibited flexibility and an openness for ongoing collaboration (some of Vodafone's key requirements). Nokia worked on an equal partnership basis and provided the algorithm source code, which increased the level of trust within the partnership.

Vodafone provided the network data, and Nokia and Vodafone together agreed on the 'product-ised algorithm' creation and delivery plans. Nokia provided the applications and the models, which were validated by Vodafone before deployment.

The application has already been deployed in Italy and Vodafone has noted good initial results. It will deploy in Portugal and nine other countries next.

Figure 2: Illustration of the architecture for the anomaly detection use case



Source: Analysys Mason, Nokia and Vodafone

Key benefits

1

Easier to deploy and scale new applications across operating companies

GCP enables Vodafone to focus on use cases and business outcomes. It has allowed Vodafone to adopt a 'develop once, deploy many times' model, which has resulted in a 60–70% reduction in effort, thereby allowing Vodafone to rapidly deploy apps in different markets. Moving to GCP has also lowered the overall cost of maintaining a platform, because Vodafone only pays for what it uses.

2

Access to global best practices and a joint innovation partner

Nokia and Vodafone will continue to jointly plan product roadmaps with ongoing collaboration on application development. The equal partnership with Nokia alongside a shared vision and partnership with GCP also provides a strong foundation for future collaboration. There is a clear separation of responsibilities between Vodafone and Nokia: Vodafone provides the network data and Nokia builds the models and applications.

3

Anomaly detection delivers efficient network planning, optimisation and operations

Anomaly detection delivers the greatest benefits in terms of automating root-cause analysis (25–30% operational efficiency improvement). It uses machine learning to automatically identify issues such as call set-up failures. Vodafone has already deployed the anomaly detection app in Italy, thereby providing a template and best practice for future app development. It plans to extend its roll-out at other OpCos.

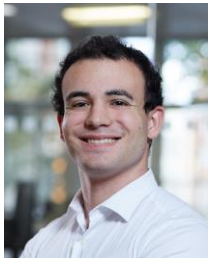
FURTHER INFORMATION

Further reading

Type	Title	Author(s)	URL
Strategy report	SPTel: harnessing the power of software-defined networking to automate operations and disrupt the B2B services market	Anil Rao	https://www.analysysmason.com/research/content/case-studies/sptel-sdn-automation-rma01-rma02/
Strategy report	Network automation: a solution framework for service agility and cost economics in cloud-enabled 5G networks	Anil Rao	https://www.analysysmason.com/research/content/short-reports/network-automation-framework-rma07-rma01-rma02/
Podcast	Automation in the 5G era: a discussion between Analysys Mason and Telia	Anil Rao and Asa Nielsen (Telia)	https://www.analysysmason.com/research/content/videos/automation-5g-telia-rma01-rma02-rma07/
Forecast report	Automated assurance: worldwide forecast 2020–2025	Anil Rao and William Nagy	https://www.analysysmason.com/research/content/reports/automated-assurance-forecast-2020-rma01/
Forecast report	Service design and orchestration: worldwide forecast 2020–2025	Anil Rao and William Nagy	https://www.analysysmason.com/research/content/reports/service-design-orchestration-forecast-rma02/

About the authors

Anil Rao (Research Director) is the lead analyst on network and service automation research that includes the *Network Automation and Orchestration*, *Automated Assurance* and *Service Design and Orchestration* research programmes, covering a broad range of topics on the existing and new-age operational systems that will power operators' digital transformations. His main areas of focus include service creation, provisioning and service operations in NFV/SDN-based networks, 5G, IoT and edge clouds; the use of analytics, ML and AI to increase operations efficiency and agility; and the broader imperatives around operations automation and zero touch networks. Anil is also a frequent speaker and chair at industry events, and holds a BEng in Computer Science from the University of Mysore and an MBA from Lancaster University Management School, UK.



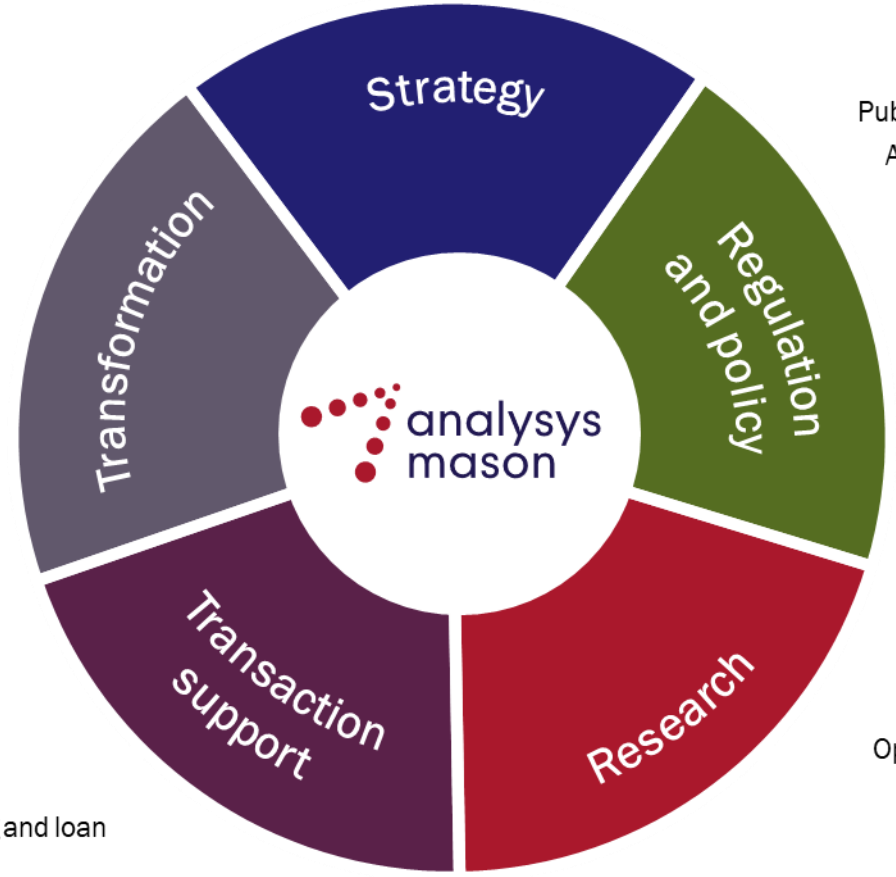
Francesco Paolo Bellomo (Research Analyst) is a member of the Data Team in London, contributing primarily to the *Telecoms Market Matrix* and *European Country Reports* research programmes. Francesco holds a BSc in Economics and Finance from Queen Mary, University of London, and a MSc in Finance from Warwick Business School.

We are experts in the telecoms, media and technology sector

Strategy
Corporate growth strategy
Business unit strategy
Infrastructure strategy

Transformation
Business transformation
Digitalisation
Operational excellence
Data, BI, steering and insights
Change and programme management
Sustainability

Transaction support
Commercial due diligence and market review
Technical due diligence
Post-merger integration
Periodical business monitoring and loan technical advisory
Opportunity scouting and pre-deal support



analysysmason.com

Regulation and policy
Network and platform
Public sector broadband intervention
Accelerating digital transformation of society
Price controls and cost modelling
Regulatory accounting
Regulatory benchmarking and analysis
Spectrum management and policy
Expert witness and litigation support
Postal regulation and policy

Research
DataHub and Regional Markets
Consumer Services
Operator Business Services and IoT Applications
SMB IT Channels and Forecasts
Cloud
Networks

analysys mason

Our research programmes

Consumer Services programmes
Fixed Broadband Services
Mobile Services
Fixed–Mobile Convergence
Smart Devices
Future Comms
Video, Gaming and Entertainment
Digital Services

Networks programmes
Next-Generation Wireless Networks
Wireless Infrastructure Strategies
Fibre Infrastructure Strategies
Operator Investment Strategies

Applications programmes
Network Automation and Orchestration
Customer Engagement
Monetisation Platforms
Digital Experience
Automated Assurance
Service Design and Orchestration

Cloud programmes
Cloud Infrastructure Strategies
Data, AI and Development Platforms
Edge and Media Platforms

analysysmason.com/services/research

Operator Business Services and IoT programmes
Large Enterprise Strategies
SME Strategies
IoT and M2M Services
Private Networks

SMB IT Channels and Forecasts programmes
Cyber Security

Regional Markets programmes
Global Telecoms Data
Americas
Asia–Pacific
Middle East and Africa
European Core Forecasts
European Telecoms Market Matrix
European Country Reports

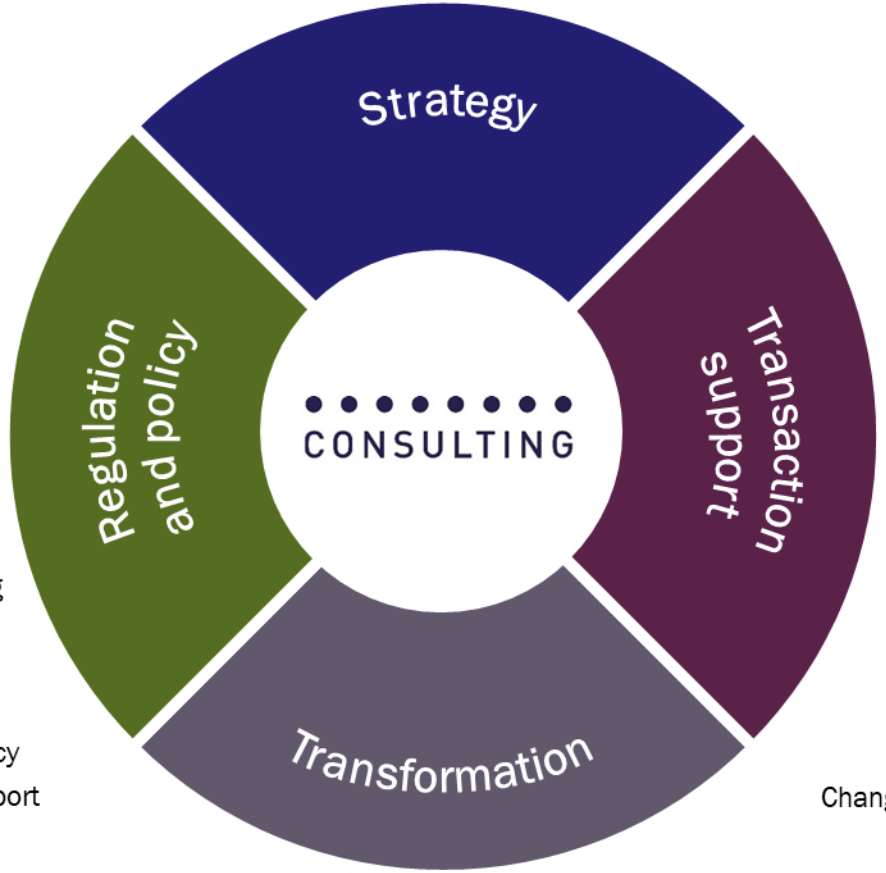
DataHub
~2800 forecast and 280+ historical metrics
Regional results and worldwide totals
Operator historical data

analysys mason

Our areas of expertise

Strategy
Corporate growth strategy
Business unit strategy
Infrastructure strategy

Regulation and policy
Network and platform
Public sector broadband intervention
Accelerating digital transformation of society
Price controls and cost modelling
Regulatory accounting
Regulatory benchmarking and analysis
Spectrum management and policy
Expert witness and litigation support
Postal regulation and policy



Transaction support
Commercial due diligence and market review
Technical due diligence
Post-merger integration
Periodical business monitoring and loan technical advisory
Opportunity scouting and pre-deal support

Transformation
Business transformation
Digitalisation
Operational excellence
Data, BI, steering and insights
Change and programme management
Sustainability

analysysmason.com/services/consulting

analysys mason

PUBLISHED BY ANALYSYS MASON LIMITED IN **JULY 2021**