# Rakuten Mobile: cloud-native assurance for end-to-end 5G network visibility
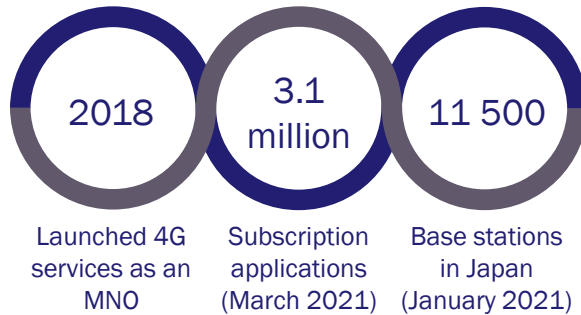
Anil Rao

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RESEARCH

# Rakuten Mobile's cloud-native assurance for 5G

## STATE OF THE BUSINESS

**2018**
Launched 4G services as an MNO

**3.1 million**
Subscription applications (March 2021)

**11 500**
Base stations in Japan (January 2021)

## FOCUS OF THIS EFFORT

**Cloud-native**
End-to-end architecture

**RAN, core, IMS**
End-to-end network visibility

**Network, service and customer**
Multi-layer assurance

## PROJECT APPROACH

**CI/CD**
Rapid development

**Partnership**
Enabling smooth implementation

**4G and 5G**
Supporting virtual 4G and 5G core
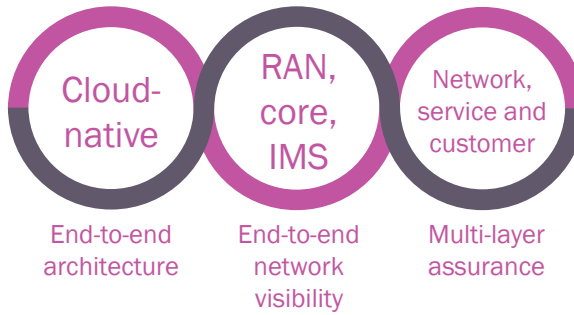
## BUSINESS DRIVERS

- Pioneer the world's first end-to-end cloud-native mobile network that is more cost-effective than traditional networks.

- Grow the subscriber base and increase the mobile market share.

- Disrupt the Japanese mobile market with a highly agile and differentiated service offering by providing subscribers with a superior customer experience.
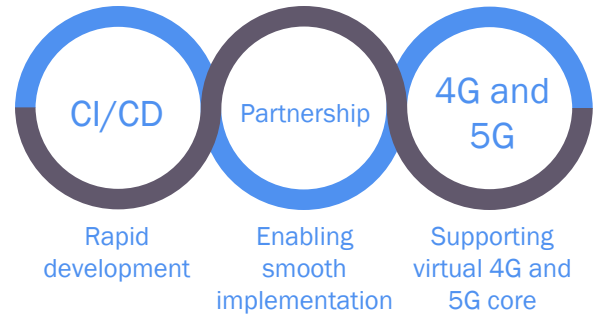
## STRATEGY

- Implement a cloud-native assurance platform to conform with Rakuten Mobile's end-to-end cloud-native network.

- Utilise packet and session data to provide end-to-end visibility covering the RAN, core and IMS.

- Provide multi-layer monitoring of network performance, service quality and network service experience.

## ANALYSIS

- The partnership with RADCOM works in an agile fashion using DevOps and CI/CD to rapidly add new functionality.

- Rakuten selected RADCOM due to its commitment to cloud-native technology and its flexibility in forming a partnership.

- It deployed RADCOM's platform to assure 4G and is now enhancing and scaling it to support 5G services with RADCOM ACE.

## 👍 BENEFITS 👍

End-to-end visibility of network performance and service quality

Rapid innovation thanks to the use of DevOps and CI/CD for the visibility platform

The ability to monitor a cloud-native network in the 5G era

Source: Analysys Mason

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# Business challenges and key drivers of the project

**Rakuten Mobile set out to provide the world's first end-to-end cloud-native mobile network that runs at a fraction of the cost of a traditional mobile network.**

Rakuten Mobile entered the Japanese mobile market as a challenger. It launched 4G services in April 2020 and 5G services in September 2020; existing 4G customers were given access to 5G at no extra cost. It was able to achieve this through the use of a fully virtualised network and extreme network automation.

Rakuten Mobile wanted to differentiate from its competition by delivering superior service quality and customer experience, predictive operations and highly responsive customer care. Near-real-time end-to-end visibility of network performance and service quality was critical to achieving this.

Consequently, Rakuten Mobile required assurance architecture that would support the end-to-end monitoring of a range of services and ensure continuous quality from instantiation to deactivation. The visibility platform and associated probes would also need to be deployed alongside the network functions within the same data centres to maximise the speed and efficiency of insight derivation.

Rakuten Mobile is continuously developing and enhancing its network, and it must do the same with its visibility platform. This necessitates continuous and agile collaboration in order to develop the platform to scale with the growth of the network and services.

Figure 1: Business factors that are driving the transformation project
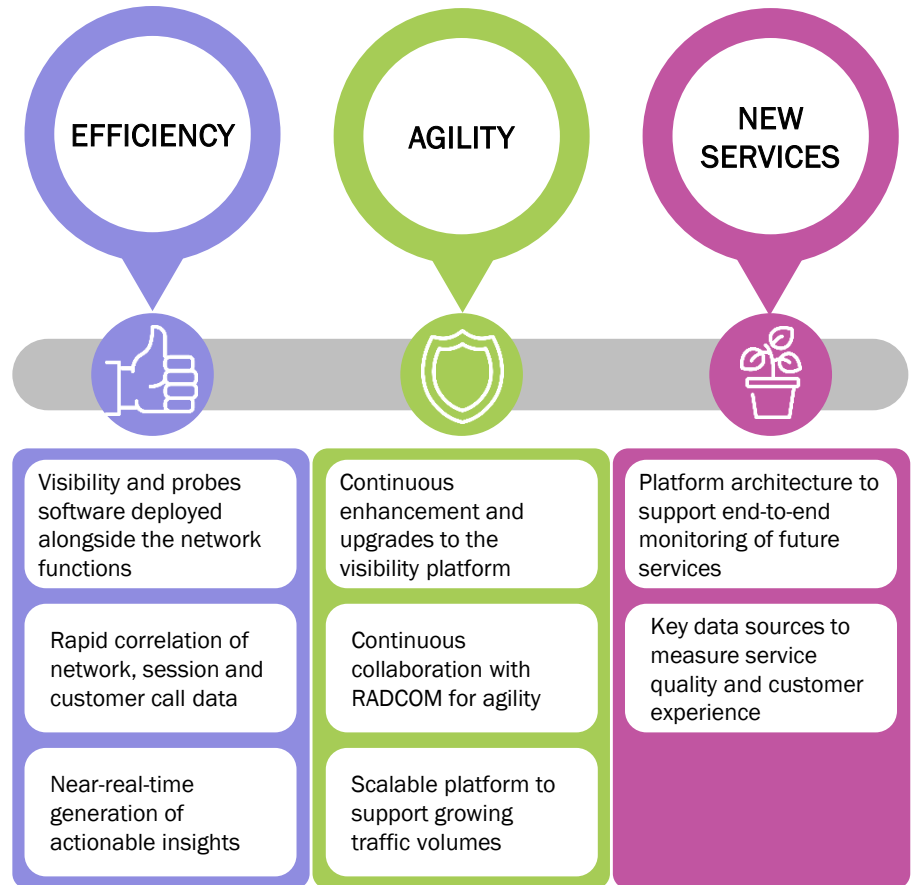


Source: Analysys Mason

# Analysis – Rakuten Mobile partnered with RADCOM to implement an end-to-end cloud-native visibility platform to monitor network and service quality

**End-to-end visibility of network and service quality is critical to enabling Rakuten Mobile to achieve its goals of delivering superior customer experiences and operating a cloud-native network.**

Rakuten Mobile's unique business problem required it to select an assurance vendor that was willing to form a flexible partnership. It selected RADCOM because of the vendor's willingness to innovate and because the ACE platform met Rakuten Mobile's architectural requirements of being cloud-native and scalable.

RADCOM's solution provides end-to-end service and subscriber visibility across the RAN, core and IMS, as well as some custom interfaces, all in a cloud-native environment. It enables the use of AI/ML for automation, which was one of Rakuten Mobile's critical requirements. As a result, Rakuten Mobile has implemented RADCOM's solution as its primary service experience monitoring solution and uses packet and session data to generate insights into the customer experience.

RADCOM's solution also provides end-to-end monitoring based on vRAN trace stream data and EPC packet data. It provides a complete set of KPI dashboards and drills down to an end-to-end correlated call trace. Customer support teams can benefit from rich customer-centric insights and customer experience data (at the subscriber and VIP group level). Additionally, RADCOM's

solution monitors the SBA reference points and decodes messages using 5G NGAP and CUPS anchoring PFCF protocols to give a correlated end-to-end view of the 5G network.

The solution is constantly updated to keep up with Rakuten Mobile's growing needs, supported by the strong partnership between the two players. RADCOM is facilitating CI/CD to rapidly address unforeseen roadblocks and developing requirements. It uses a replica system of Rakuten Mobile's network, based on live network data, to test new features without affecting live services. This gives Rakuten Mobile the confidence to roll out changes in its network with a high chance of success.

RADCOM's solution was initially installed on virtual machines, with some aspects in containers. Eventually, the solution (and the network as a whole) will exist entirely on the Rakuten Communications Platform (RCP) (see Figure 2 on slide 7).

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# Key benefits

## 1

### End-to-end visibility of network performance and service quality

Rakuten Mobile is able to use the RADCOM ACE platform to gain end-to-end visibility of network performance and service quality. It can also derive customer experience metrics using AI/ML-based insights. In the future, Rakuten Mobile intends to correlate the insights with those from its parent company's other applications (including e-commerce, travel and TV) to gain a 360-degree view of its customers.

## 2

### Rapid innovation thanks to the use of DevOps and CI/CD for the visibility platform

Rakuten Mobile is able to work closely with RADCOM and innovate rapidly thanks to the use of DevOps and CI/CD.

Rakuten Mobile will be able to quickly adapt the platform to changes in the business and network. RADCOM's flexibility and willingness to partner with Rakuten Mobile on this journey will be critical for success, both now and in the future.

## 3

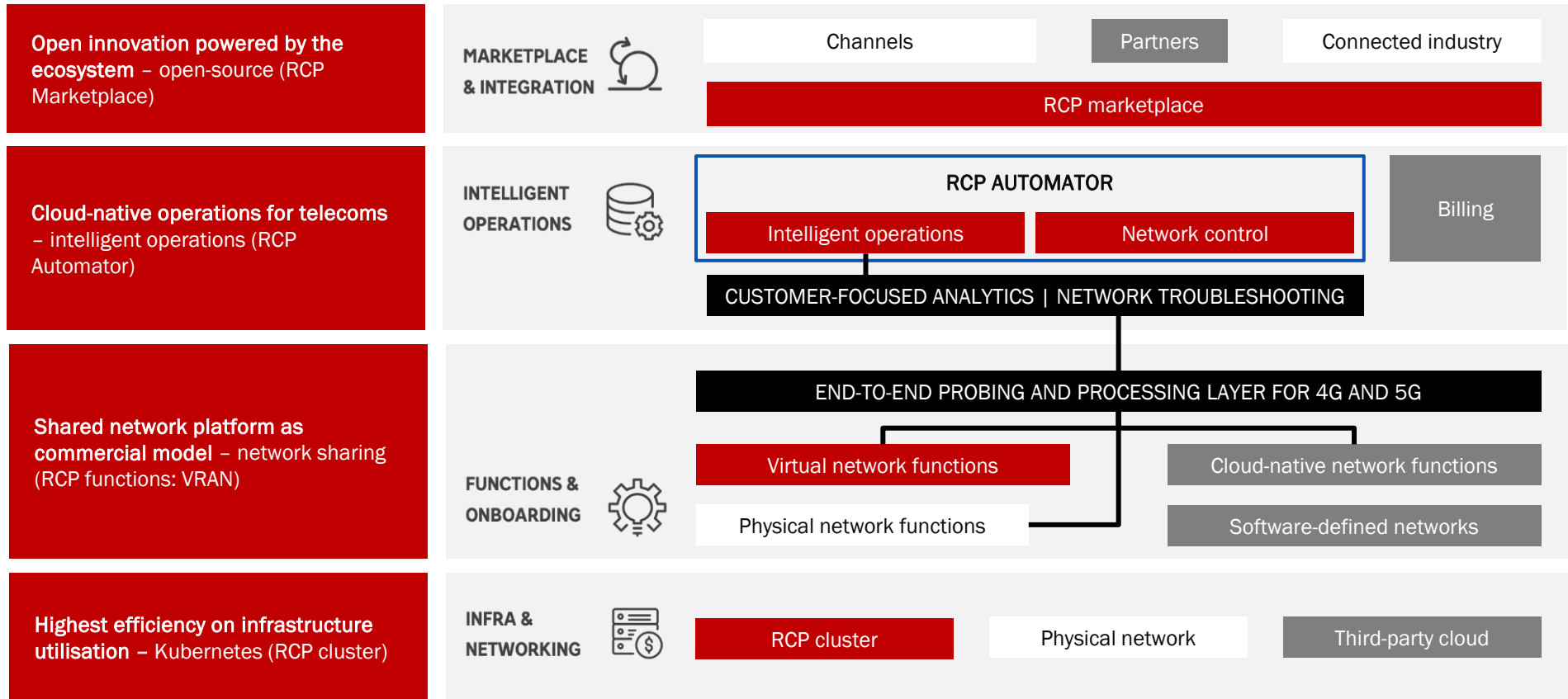### The ability to monitor a cloud-native network in the 5G era

Rakuten Mobile has secured and implemented RADCOM's cloud-native assurance solution, which will eventually be migrated to the RCP. This is key to achieving a completely cloud-native network and keeping opex low.

The platform provides Rakuten Mobile with the capability to monitor its virtualised and cloud-native infrastructure, along with both 4G and 5G services.

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# FURTHER INFORMATION

# Overview of the RADCOM solution

Figure 2: RADCOM's implementation in Rakuten Mobile's architecture



| Open innovation powered by the ecosystem – open-source (RCP Marketplace) | MARKETPLACE & INTEGRATION | Channels / Partners / Connected industry / RCP marketplace |
| Cloud-native operations for telecoms – intelligent operations (RCP Automator) | INTELLIGENT OPERATIONS | RCP AUTOMATOR — Intelligent operations / Network control / Billing / CUSTOMER-FOCUSED ANALYTICS \| NETWORK TROUBLESHOOTING |
| Shared network platform as commercial model – network sharing (RCP functions: VRAN) | FUNCTIONS & ONBOARDING | END-TO-END PROBING AND PROCESSING LAYER FOR 4G AND 5G / Virtual network functions / Cloud-native network functions / Physical network functions / Software-defined networks |
| Highest efficiency on infrastructure utilisation – Kubernetes (RCP cluster) | INFRA & NETWORKING | RCP cluster / Physical network / Third-party cloud |

Key: Rakuten / Ecosystem / RADCOM

Source: RADCOM

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# About the author



**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 also works with clients on a range of consulting engagements such as strategy assessment and advisory, market sizing, competitive analysis and market positioning, and marketing support through thought leadership collateral.

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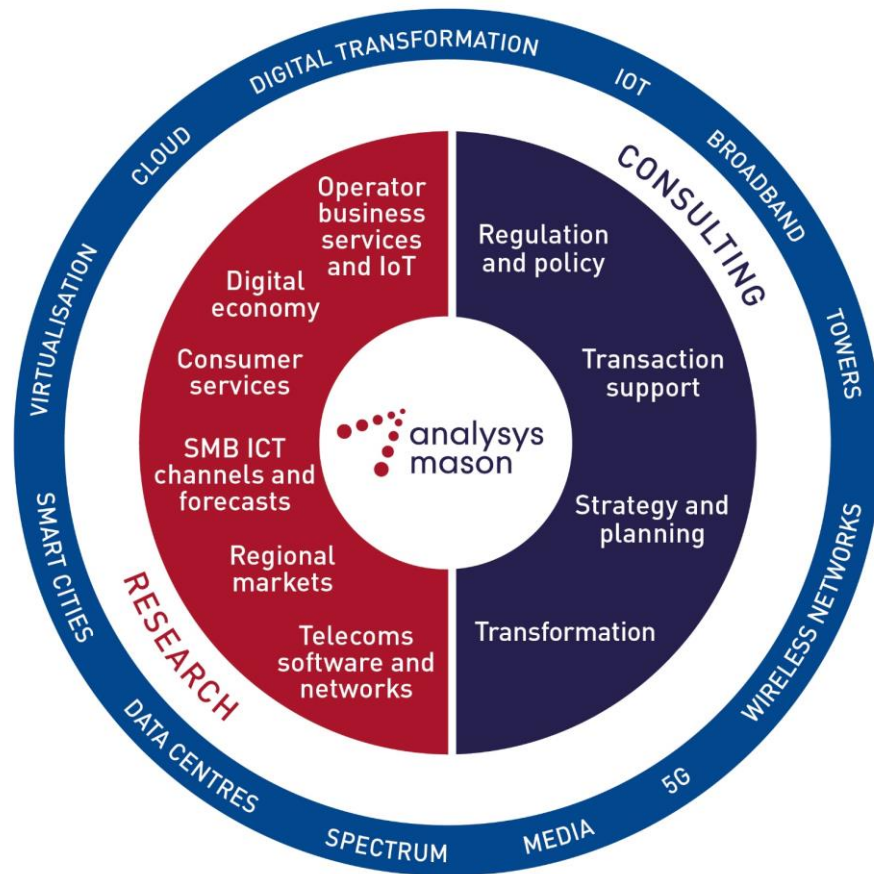


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We are future-focused and help clients understand the challenges and opportunities new technology brings.

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Our dedicated team of analysts track and forecast the different services accessed by consumers and enterprises.

We offer detailed insight into the software, infrastructure and technology delivering those services.

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Operator Investment Strategies

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

**Cloud programmes**
Cloud Infrastructure Strategies
Data, AI and Development Platforms
Media Platforms
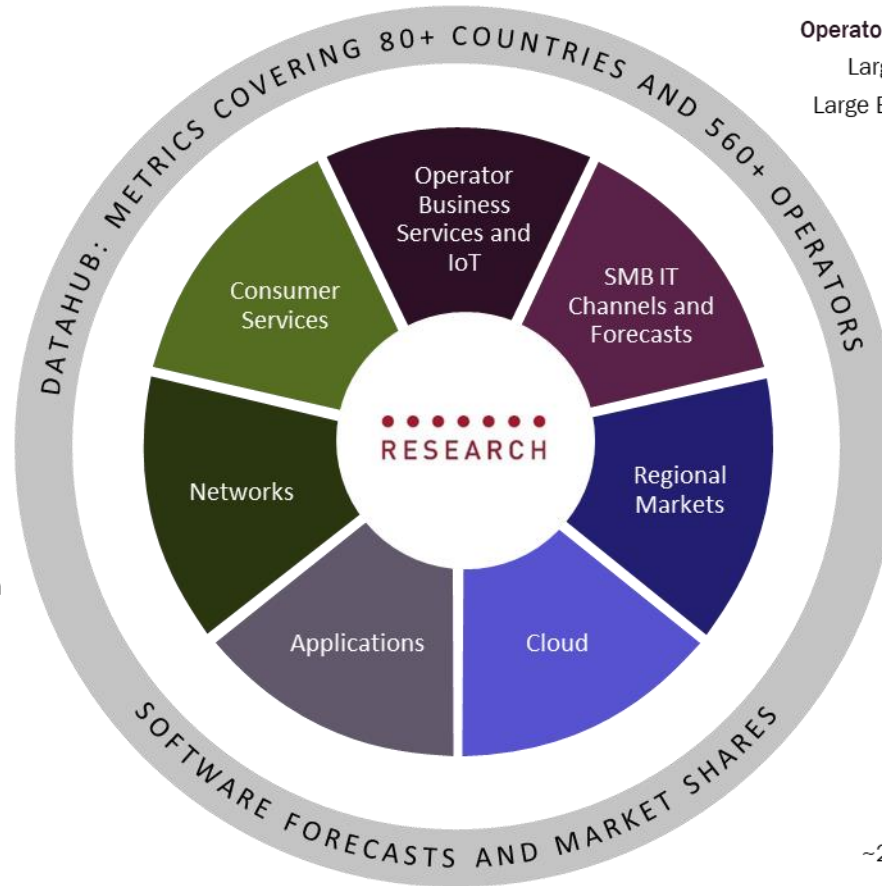
**Operator Business Services and IoT programmes**
Large Enterprise Voice and Data Connectivity
Large Enterprise Emerging Service Opportunities
SME Strategies
IoT and M2M Services
IoT Platforms and Technology

**SMB IT Channels and Forecasts programmes**
Cyber Security

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

**DataHub**
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Ex-post / abuse of dominance

Postal sector

**Transformation**

Transformation programmes

Assurance

Implementation

Delivery
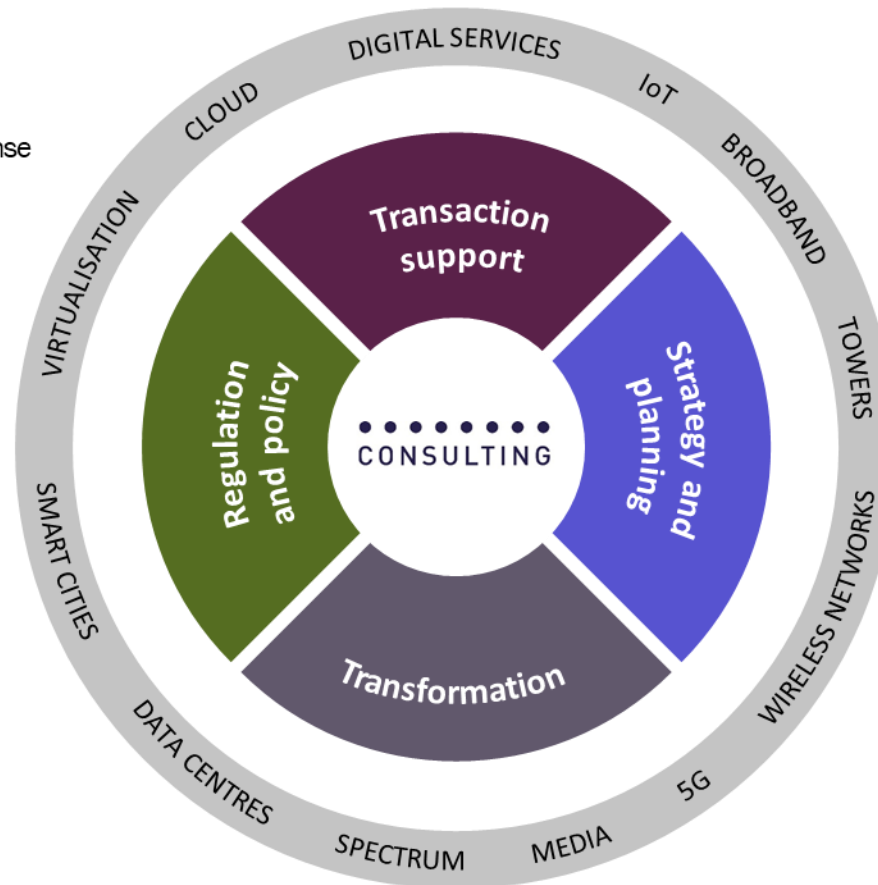
**Transaction support**

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Financial valuation

Debt financing

Lending technical advisory

Opportunity scouting

Business plan review

**Strategy and planning**

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CONSULTING

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