

COMPANY PROFILE

RADCOM: SERVICE ASSURANCE

ANIL RAO



Company summary

RADCOM Network Intelligence portfolio includes: a probe-based service assurance solution, a network visibility layer with intelligent load balancing, a network packet brokering and advanced network insights capabilities.

RADCOM’s flagship product, MaveriQ, is a NFV ready probe based service assurance solution providing visibility into CSPs’ physical and virtual networks. Operators rely on such a solution to assure superior network performance and provide superior customer experience as they embrace NFV/SDN.

RADCOM is a fast-growing vendor offering a software-based, hardware-agnostic probes solution that can be deployed as a VNF. RADCOM seeks to grow market share by dominating the NFV assurance market with cutting edge cloud native probes and disruptive pricing models. RADCOM launched a virtual network packet broker to complement its probes, creating a fully vertically integrated stack comprising of network visibility, assurance and analytics, and business intelligence.

RADCOM was the first vendor to announce a commercial NFV assurance deal, with AT&T¹ and in October 2017, announced a second NFV contract with a leading Tier 1 CSP.

RADCOM’s head start in the virtual probes technology, the Tier 1 CSP wins and the growing sales pipeline strongly positions the company in the market for hybrid and NFV service assurance.

¹ For more information, please see Analysys Mason’s [Commercial network function virtualisation \(NFV\) contracts in service assurance are starting to emerge.](#)

Figure 1: RADCOM company facts

| | |
|-------------------------------|---|
| Founded | 1991 |
| Offices | HQ in Tel Aviv, Offices in New Jersey, Sao Paulo, India |
| Employees | 200+ |
| Regional focus | Worldwide customer base |
| Revenue | USD 37.2 million (source: RADCOM) |
| Customers | Algar Telecom, BT, China Telecom, GVT, KPN, M1, MTN, Orange, Telecom Argentina, Telefonica, TIM, Vivo |
| Selected key customers | AT&T, Globe Telecom |
| Partnerships | Nokia, Intel, HPE, Amdocs, Red Hat |

Source: RADCOM

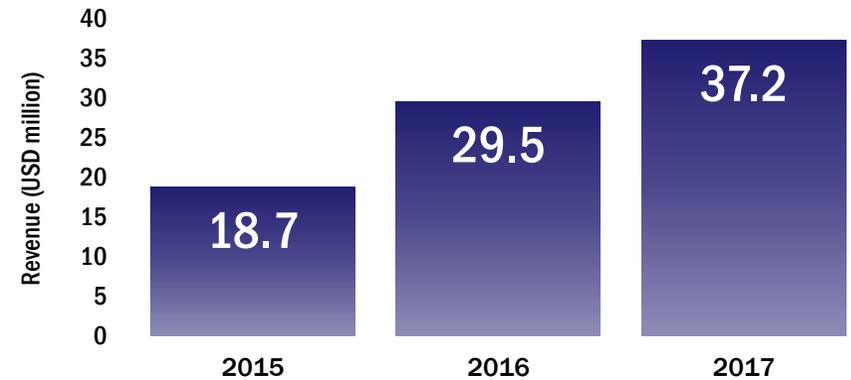
Company summary: financials

Growing at about 15% CAGR, RADCOM has nearly doubled its revenue in three years, largely owing to Tier 1 NFV deals and account expansions. RADCOM is growing significantly above the market and is an outlier in an otherwise slow growth market. This upswing in revenues is indicative of the demand and increased adoption of RADCOM's solutions by telecom operators who are increasingly adopting NFV/SDN based networks.

According to Analysys Mason estimates, the company derives about half of its revenue from the North American market, largely owing to its success at AT&T and other advanced operators that are commercialising NFV. Western Europe contributed to about fifth of the revenue, where as LATAM contributed to about 13%. Given that a significant share of NFV activity is expected to take place in North America and Europe, the company expects to further extend its footprint with Tier-1 operators in these markets.

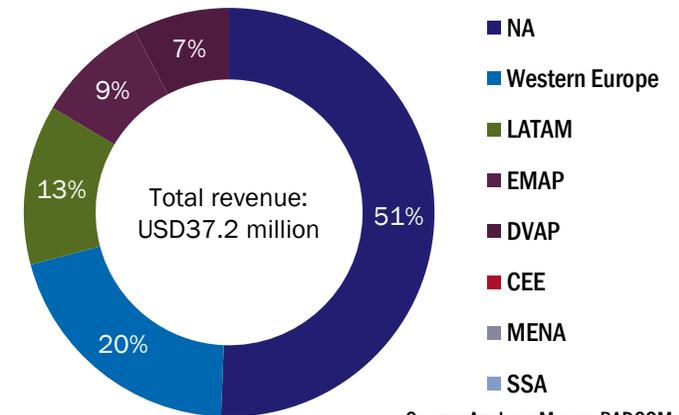
Furthermore, the experience of delivering to AT&T and the second Tier 1 win is expected to strongly position RADCOM in other operators that are in the process of choosing a supplier for probes and network visibility solutions for hybrid and NFV networks. Customer experience assurance continues to be a priority for operators worldwide, which will be another key area of business opportunity for RADCOM.

Figure 2: RADCOM's revenue, worldwide, 2015-2017



Source: Analysys Mason, RADCOM

Figure 3: RADCOM's revenue by region, worldwide, 2017



Source: Analysys Mason, RADCOM

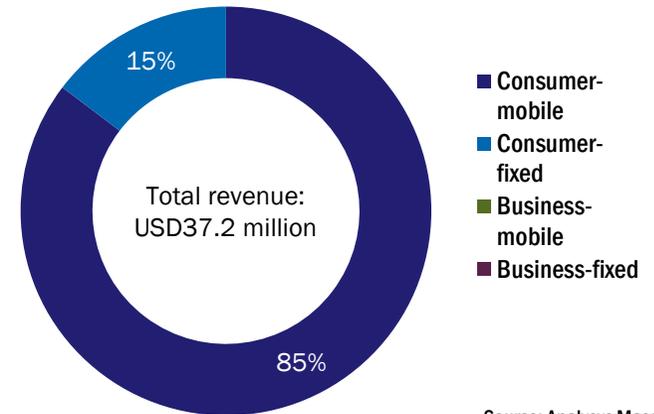
Strategic direction

Building on its strong history in probes systems technology, RADCOM disrupted the market by offering the industry’s first NFV compliant virtual probes solution. Following from its technical and commercial success, RADCOM is aggressively investing in R&D, and has now brought to market a cloud-native virtual probe. Combined with its COTS based software probes, virtual and cloud native probes, RADCOM has the full complement of probes, supporting physical, hybrid and NFV network environments.

RADCOM has also disrupted the commercial model of probes systems by providing operators with a pricing approach centred around the concept of “constant” pricing, a solution at a recurring and regular fee. This pricing model allows operators to scale up their assurance solution as the network grows, only paying additional fee as they add more services, not based on traffic. In February 2018, RADCOM announced the launch of a cloud native network visibility solution, making its entry, and disrupting the established packet broker market.

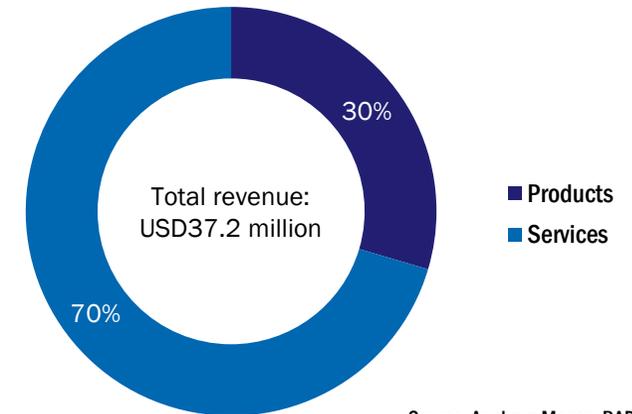
RADCOM has developed its own VNF Manager to orchestrate its VNFs, which also integrates with third party network orchestration systems. RADCOM also works with partners to accelerate operators transition to NFV. For operators who lack a telco cloud environment, RADCOM partners with Red Hat to offer a turnkey cloud solution with MaveriQ.

Figure 4: RADCOM's revenue by sector, worldwide, 2017



Source: Analysys Mason

Figure 5: RADCOM's revenue by products and services, worldwide, 2017



Source: Analysys Mason, RADCOM

RADCOM's MaveriQ supports existing physical networks and the evolving hybrid and NFV networks with software, virtual and cloud native probes

Figure 6: MaveriQ product evolution

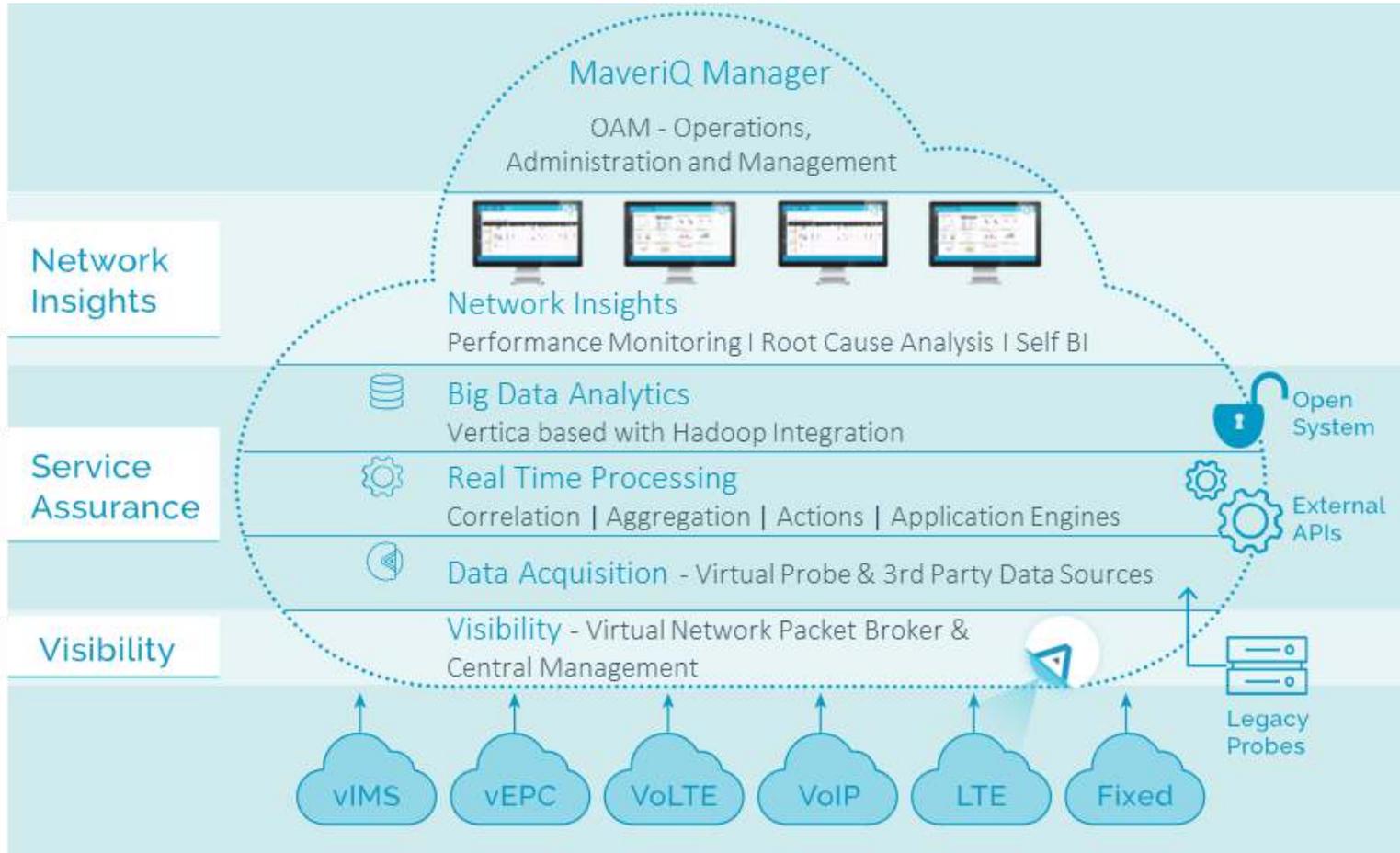


Source: RADCOM

RADCOM's value proposition is that it offers an integrated solution portfolio that eases operators transformation to NFV. MaveriQ supports both physical and hybrid networks with probes deployed on COTS hardware. Furthermore, with its fully virtualised and cloud native probes, MaveriQ also supports pure NFV environments, enabling integration into an operator's established telco cloud platform, and monitoring and assuring the network VNFs and services delivered over the NFV network (refer to figure 6). The MaveriQ solution is ETSI compliant and has been integrated with Nokia CloudBand, Amdocs, ONAP and Open Source MANO (see Figure 7 in the next page).

RADCOM offers a fully vertically integrated stack covering virtual network packet broker, vProbes based SA and business intelligence

Figure 7: RADCOM Network Intelligence



Source: RADCOM

RADCOM Network Intelligence portfolio solution summary [1]

Figure 8a: RADCOM's products

| Solution | Analysys Mason segment | Description |
|-------------------|------------------------|--|
| Service Assurance | Service Assurance | <p>RADCOM's cloud-native probe-based MaveriQ solution, the core of its service assurance proposition, enables operators to assure multiple telecom technology domains and generations, including LTE, Advanced-LTE, IMS, Fixed Wireless and NFV/SDN. The solution can be integrated into an NFV environment as a VNF with multiple VNFC (VNF Components) to yield rich, actionable intelligence that enhances network operations and enables monitoring of North-South and East-West traffic. Managed by MaveriQ Manager a Virtual Network Functions Manager (VNFM). As a key component of the NFV MANO architecture framework, the VNFM is responsible for full lifecycle management of the MaveriQ VNFs under the control of the NFV Orchestration (NFVO) for onboarding, instantiation and scaling.</p> <p>As depicted in Figure 7, there are two sub-components that make up the larger whole: the big data analytics layer for data processing; and the data acquisition layer, which is a function fulfilled by virtual probes designed to be agile and lightweight for cloud environments.</p> <p>The platform can not only source inputs from the company's own probes but also 3rd party network data sources including XDR/EDR feeds, 3rd party legacy probes and network elements using in-built modules that handle data conversion. It can also receive and process packets from a variety of sources/methods including vTAPs, virtual and physical port mirroring, VNFs and TAPs over GRE tunnels.</p> <p>RADCOM's probe-based service assurance solution enables CSPs to achieve the following:</p> <ul style="list-style-type: none"> • A view of their customers' quality of experience across numerous heterogeneous network domains • Enhance quality of service and quality of experience • Adopt proactive troubleshooting to reduce churn and protect revenue streams |

Source: Analysys Mason, RADCOM

RADCOM Network Intelligence portfolio solution summary [1]

Figure 8b: RADCOM's products

| Solution | Analysys Mason segment | Description |
|------------------|--|---|
| Network Insights | Service Assurance Network Visibility ¹ | <p>RADCOM Network Insights deliver real time business and network insights that are extracted from the network via RADCOM Service Assurance and RADCOM Network Visibility. These insights provide actionable intelligence for NOC/SOC, engineering, marketing, customer care, operations and management to optimize network performance, maintain service quality and deliver a high customer experience.</p> <p>RADCOM has acquired a lot of proficiency as a result of its work with CSPs, reflected in the library of off-the-shelf use cases it offers:</p> <ul style="list-style-type: none"> • 5G assurance on the edge - network insights for mobile edge computing with dynamic probes • IoT service assurance - end-to-end visibility and cost-effective assurance for IoT networks • Customer care – provides customer care representatives with a clear view of customer’s omnichannel experience • NOC dashboard – provides dynamic service dashboards to NOC/SOC operators for efficient monitoring of the service • OTT application analytics - insight into OTT app and content usage to improve customer retention and increase revenue • Roaming analytics – collects roaming subscribers’ traffic, location and movements to integrate service assurance functionality for both inbound and outbound roaming • Unique-subscriber analytics – with this use case, MaveriQ claims to offer a 360 degree view of a customer’s quality of experience across all network domains. |

Source: Analysys Mason, RADCOM

¹ Note: Network packet broker (NPB) technology is not covered in the Analysys Mason Service Assurance segment, but RADCOM Network Visibility has been included for completeness.

RADCOM Network Intelligence portfolio solution summary [1]

Figure 8c: RADCOM's products

| Solution | Analysys Mason segment | Description |
|--------------------|-----------------------------|--|
| Network Visibility | Not applicable ¹ | <p>RADCOM Network Visibility (see Figure 7) provides a stand-alone virtual network packet broker (vNPB) that brokers network packet traffic from SPAN ports or network taps between network elements, and manipulates the traffic allowing for more-efficient use of service assurance and security-related monitoring solutions. RADCOM Network Visibility can work in unison with RADCOM Service Assurance or as a stand-alone product.</p> <p>RADCOM Network Visibility is integrated with an advanced management system providing access to a host of troubleshooting tools. Due to its cloud-native design, RADCOM Network Visibility is not limited to specific hardware; as a result, the solution can be scaled efficiently to realize high-scale packet brokering in distributed cloud environments.</p> <p>RADCOM Network Visibility enables telecom operators to achieve the following:</p> <ul style="list-style-type: none"> • Manage, scale and load-balance the network traffic • Centrally manage packet brokering at scale • Automate and synchronize network visibility and assurance onboarding and configuration • Troubleshoot and analyse network traffic samples at the packet broker layer • Share traffic among service assurance probes for efficient use of network resources • Analyse and filter traffic with application-based routing • Apply traffic filtering at the tapping point in a bid to save network and bandwidth resources • Efficiently manage network performance from a centralized management solution |

Source: Analysys Mason, RADCOM

¹ Note: Network packet broker (NPB) technology is not covered in the Analysys Mason Service Assurance segment, but RADCOM Network Visibility has been included for completeness.

RADCOM provides out of the box applications for important use cases demanded by operators [1]

Figure 9a: RADCOM's products

| Solution | Analysys Mason segment | Description |
|------------|------------------------|--|
| QVIP | Service management | <ul style="list-style-type: none"> • Run and display a dedicated VIP service quality feed, to keep up with SLAs • Provide rapid analysis and resolution even before subscribers become aware of issues • Use deep drill down to discover root causes of any service deterioration • Deliver easy cross-department cooperation via a VIP dashboard that spans the organization • Display VIP trends that aid in relevant marketing for VIP Subscribers |
| QiCare | Service management | <ul style="list-style-type: none"> • Give a clear overview of issues, for quick and satisfying resolution • Display clear, concise subscriber data so customer care handle calls smoothly |
| QMyHandset | Service management | <ul style="list-style-type: none"> • Serve up statistics on handset usage trends for sales and marketing optimization • Identify handsets degrading the network, to prevent customer experience deterioration |
| QAlarm | Probe systems | <ul style="list-style-type: none"> • Push auto notifications of network and service problems without manual monitoring • Deliver auto alarms for multiple services and departments, across all MaveriQ applications • Set alarm thresholds for aggregated KPIs • Track online service usage to control network load or service abuse |

Source: Analysys Mason, RADCOM

RADCOM provides out of the box applications for important use cases demanded by operators [2]

Figure 9b: RADCOM's products

| Solution | Analysys Mason segment | Description |
|-----------|------------------------|--|
| QTrace | Probe systems | <ul style="list-style-type: none"> Resolve complex network and subscriber issues Correlate full voice and data sessions in real time, to display sessions' network paths for comprehensive troubleshooting Present per-call voice quality indicators for rapid issue recognition Per regulation, record voice calls for lawful interception or quality testing Improve VoLTE/VoWiFi calls even during handover to 2G or 3G with end-to-end network troubleshooting coverage |
| QAnalyzer | Probe systems | <ul style="list-style-type: none"> Perform packet-based, protocol analysis for drive testing new technology roll-outs and in-depth troubleshooting. Deep and flexible protocol analysis at the raw data level Accomplish session-based, call tracing analysis with QTrace and then drill down to the protocol layer with QAnalyzer |
| QRoam | Service management | <ul style="list-style-type: none"> Ensure SLAs for roaming-out packages Accelerate roaming issue resolution time, growing inbound and outbound roaming usage Analyze roaming partner data to provide a better quality outbound customer experience Diagnose failures and glitches in service per roaming operator for fast recovery Increase revenue by ensuring top quality outbound roaming Help CSP stand out as the operator of choice for inbound roaming steering Analyze trending service usage for roaming partners, to provide attractive roaming packages |

Source: Analysys Mason, RADCOM

RADCOM provides out of the box applications for important use cases demanded by operators [3]

Figure 9c: RADCOM's products

| Solution | Analysys Mason segment | Description |
|----------|------------------------|---|
| QConnect | Service management | <ul style="list-style-type: none"> • Present a clear analysis of interconnected services to evaluate partners' SLA conformance • Block revenue leakage: deliver real-time intelligence on network issues • Rapidly identify interconnect problems for swift resolution • Provide historical data of interconnection services to allow for more informed planning of future partner agreements |
| QAssure | Probe systems | <ul style="list-style-type: none"> • Monitor and optimize M2M & IoT services provided to enterprise customers • Provide real-time alarms for machine anomalies |
| QCell | Service management | <ul style="list-style-type: none"> • Locate and analyze poorly performing cells • Proactively improve subscriber QoE: optimize cell performance • Prepare for special high-traffic events such as a mass attendance sports match • Show location-based service utilization for marketing statistics purposes |

Source: Analysys Mason, RADCOM

Significant customers [1]

Figure 10: RADCUM's key customers

| Customer | Country | Scope |
|-------------------|---------------|--|
| AT&T | USA | Maveriq is being used to migrate the service assurance functionality to the cloud and to integrate the virtual probe (vProbe) functions into the network through ECOMP/ONAP. Virtualised service assurance is being used to boost network performance optimization and help identify and isolate network issues to maximize customer experience. |
| Globe Telecom | Philippines | Maveriq is used for service assurance and customer experience analytics for Globe Telecom's mobile network. Providing multiple departments with real-time customer experience insights to assure service quality and the customer experience for over 60 million customers. Going forward, Maveriq will enable Globe to smoothly and reliably transition to NFV. |
| Tier 1 operator | LATAM | Maveriq is used for service assurance of the operator's fixed line enterprise services, assuring that enterprise services match agreed service level agreements and ensuring that issues are rapidly resolved. |
| Tier 1 operator | LATAM | Maveriq is used for service assurance of both the operator's fixed and mobile networks. |
| Top tier operator | Not disclosed | Maveriq is used for service assurance on the virtualized network. |

Source: RADCUM

Analysis: strengths, weaknesses, opportunities and threats

STRENGTHS

- RADCOM is achieving good success with large Tier 1 operators in the growing area of NFV service assurance. It is the only vendor that is growing faster than the market.
- AT&T is the company's flagship customer for its MaveriQ solution and provides a strong reference implementation for the company when bidding for new business.
- The company has a strong R&D culture, that is demonstrated by its ability to disrupt the market with new products such as Network Visibility.
- Its new licensing model provides operators a constant and recurring pricing based on services not on traffic.

OPPORTUNITIES

- As more operators embrace NFV and cloud native networks, the demand for software based-, virtual-, and cloud native probes will increase.
- Continued demand for service quality and customer experience assurance solutions are immediate and opportunities for RADCOM.
- Some North American operators are planning a 5G launch in 2019, which will be another growth opportunity for the company, given that RADCOM is already deployed at AT&T.
- With its Network Visibility solution, the company can provide a fully integrated solution stack if the operator demands it.

WEAKNESSES

- RADCOM will face the challenge of executing large projects for Tier 1 operators while managing growth around NFV and 5G, but so far it has shown good success at AT&T while winning new deals.
- The company is associated with NFV service assurance due to its success with AT&T, and needs to change this market perception by strongly highlighting its abilities to assure existing networks and address current operations challenges.

THREATS

- RADCOM will face strong competition from incumbent vendors as it looks to expand into new markets and operators. For example, Netscout and Empirix also have ambitions to succeed in the NFV assurance market and are bringing virtual probe solutions to the market.
- The operators' slow adoption of NFV in some markets could have a negative impact on RADCOM's ability to rapidly grow its revenue.

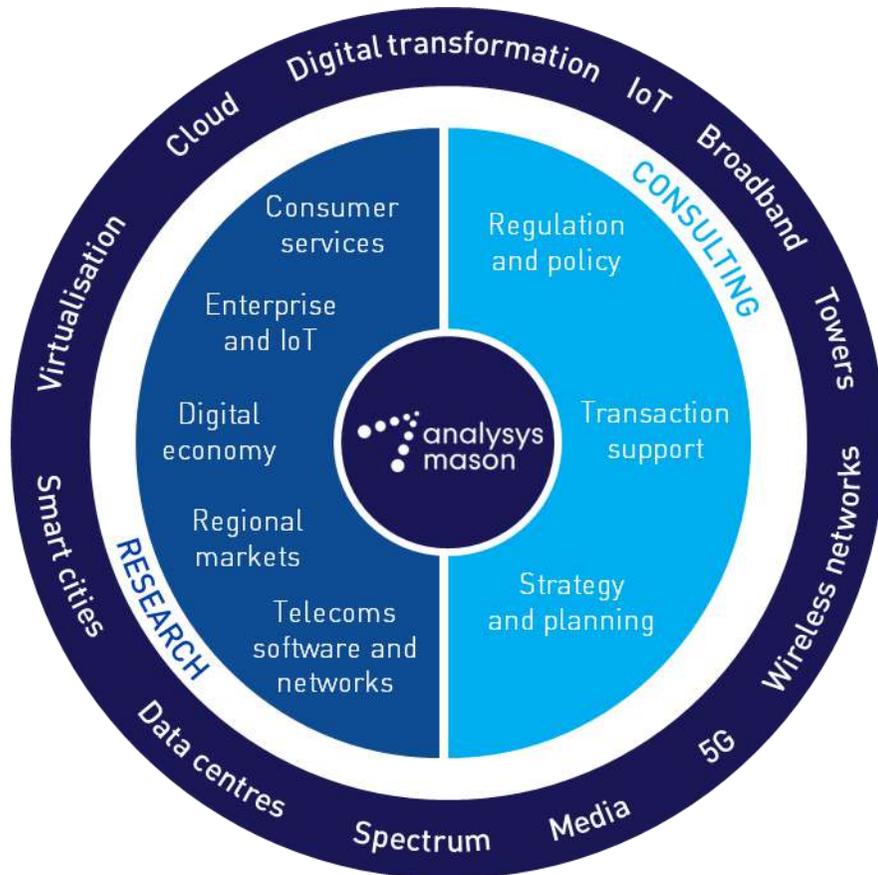
About the author



Anil Rao (Principal Analyst) is the lead analyst for the *Service Assurance* and *Service Fulfilment* research programmes. He produces market share, forecast and research collateral for the programme and focuses on industry topics including NFV/SDN and their impact on service assurance, and the importance of service assurance in reducing churn and improving customer experience. He has also published research on IP probes, real-time network analytics and unified service assurance. He holds a BEng in Computer Science from the University of Mysore and an MBA from Lancaster University Management School, UK.

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