Perspective

How rApps are accelerating the journey to autonomous RAN operations

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1. Executive summary

Operators are accelerating their adoption of rApps as they seek more flexible ways to advance automation in their RAN operations. rApps hosted on SMO platforms are becoming the preferred approach for introducing new automation capabilities, and for supporting more complex use cases and end-to-end orchestration across multi-vendor environments. This momentum is closely linked to operators' broader ambition to progress towards higher levels of autonomous networking (AN), and in turn intent-driven operations, driven by rising operational costs and complexity and the need to deliver high-performance networks and improved service quality. This report, based on our survey of operators worldwide in 2026,[1] reveals that rApps hosted on service management and orchestration (SMO) platforms are paving the way to higher levels of AN maturity.

1.1 Reducing operational complexity in end-to-end service orchestration

SMO plays a central role in reducing the complexity associated with co-ordinating end-to-end service orchestration. It supports standardized and open interfaces that will allow operators to orchestrate closed-loop automation workflows across multi-vendor RAN environments and reduce operational overheads linked to fragmented toolchains.

1.2 Leveraging advanced AI capabilities to address more complex automation

rApps allow operators to integrate AI capabilities into RAN operations such as self-healing and optimization processes to enable more advanced automation. Operators increasingly view public cloud providers (PCPs) as critical partners who provide advanced AI models (including agentic and intent-based AI), model training and compute resources.

1.3 Openness as a core architectural strength for greater innovation

The SMO allows operators to unlock a wider innovation ecosystem and flexibly integrate best-of-breed and third-party rApps to introduce specialized capabilities and extend automation into new and diverse use cases beyond what a single-vendor stack typically offers.

1.4 The upside of the SaaS delivery models

A growing consensus has emerged regarding delivery models for RAN automation software. The need for dynamic, real-time updates to AI models has made software-as-a-service (SaaS) models a well-suited commercial model for rApps. As a result, there is a high expectation that SaaS will become the dominant commercial model for rApps in the medium term.

[1] Analysys Mason surveyed 50 Tier-1 CSPs and conducted an extensive questionnaire and interviews with five RAN automation professionals from Tier-1 CSPs. The fieldwork was conducted between 5 January 2026 and 27 January 2026. See the appendix for more information.

2. Recommendations for operators

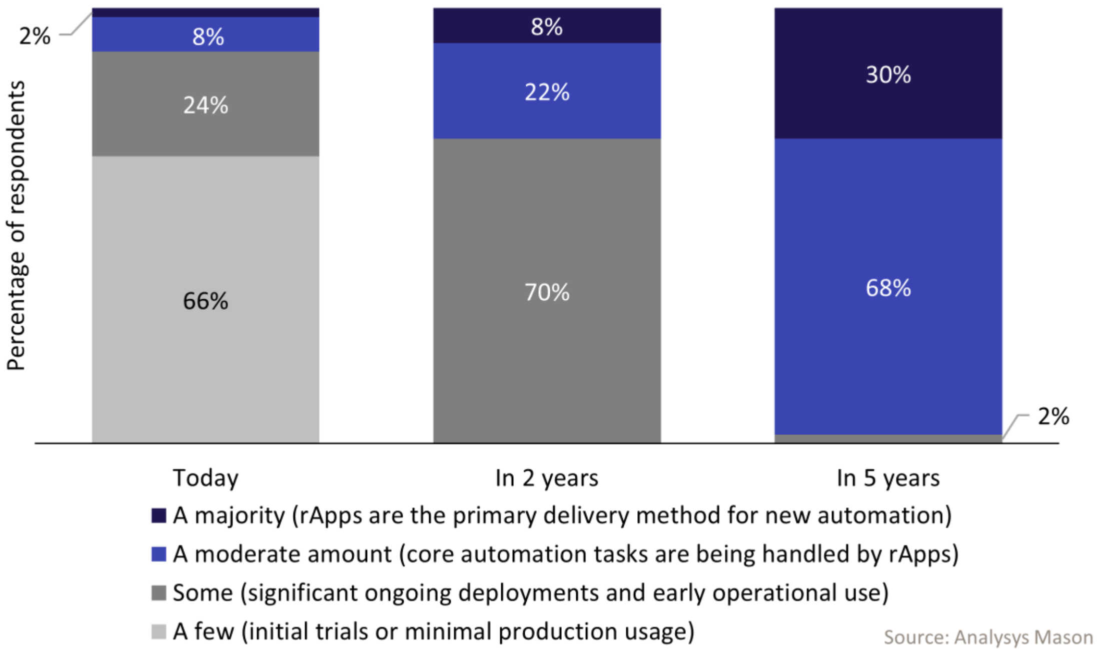
- **Adopt an SMO-centric architecture to enable deployment of a wide range of advanced RAN automation use cases by leveraging an open ecosystem of rApps.** The number of rApps required to support advanced use cases will increase as networks progress towards higher levels of automation. SMO provides a standardized platform for deploying and managing an increasing volume and diversity of rApps.
- **Take an ecosystem-focused approach to openness beyond protocol compliance by selecting platforms that enable functioning third-party marketplaces.** Operators are increasingly viewing advanced AI capabilities as essential for reaching higher levels of AN. SMO provides support for standardized interfaces not just for RAN hardware and software, but also for rApps. Ericsson's, communication service providers' (CSPs') and third-party rApps can coexist in the same deployment through the R1 interface.
- **Align procurement with SaaS models to ensure automation logic and AI models remain updated against evolving operational demands**. Autonomous operations require frequent software updates, including security updates, to guarantee network robustness and resilience and uphold sovereignty requirements. SaaS ensures new policies and features can be updated dynamically and scaled on demand without the delays associated with perpetual licensing, which enables operators to meet stringent performance requirements and SLAs.

3. How rApps and agentic AI are reshaping operators' RAN automation journeys

The industry is witnessing a shift in RAN automation approaches. Traditional SON systems are not sufficient to support higher levels of automation. Therefore, rApps are becoming an increasingly important to meet the demands of higher levels of autonomous operations.

Our survey indicates a strong link between the importance of rApps-based automation and the achievement of higher AN levels, with rApps becoming a primary vehicle for supporting new automation. The approximate volume of automation delivered via rApps is expected to more than triple in the next 2 years, and more than triple again in the next 5 years (Figure 1).

Figure 1: Volume of rApps-based automation deployed today, in 2 years and in 5 years



The above answers indicate that automation is transitioning from proprietary tools to standards-based approaches centred on SMO and rApps. These approaches are now increasingly serving as the orchestration framework for enabling autonomous RAN operations.

> "We already have automation and rApps running around the clock, adjusting parameters in real time and reacting faster than any engineering team could. Some functions are completely hands-off; when a site goes down, the system automatically tilts neighbouring cells to fill the gap and we just let it run. With the network becoming too complex for humans to manage manually, this kind of closed-loop automation is essential for how we operate the RAN."
>
> - RAN Engineering Lead – Tier-1 operator, North America

3.1 Drivers of rApps adoption

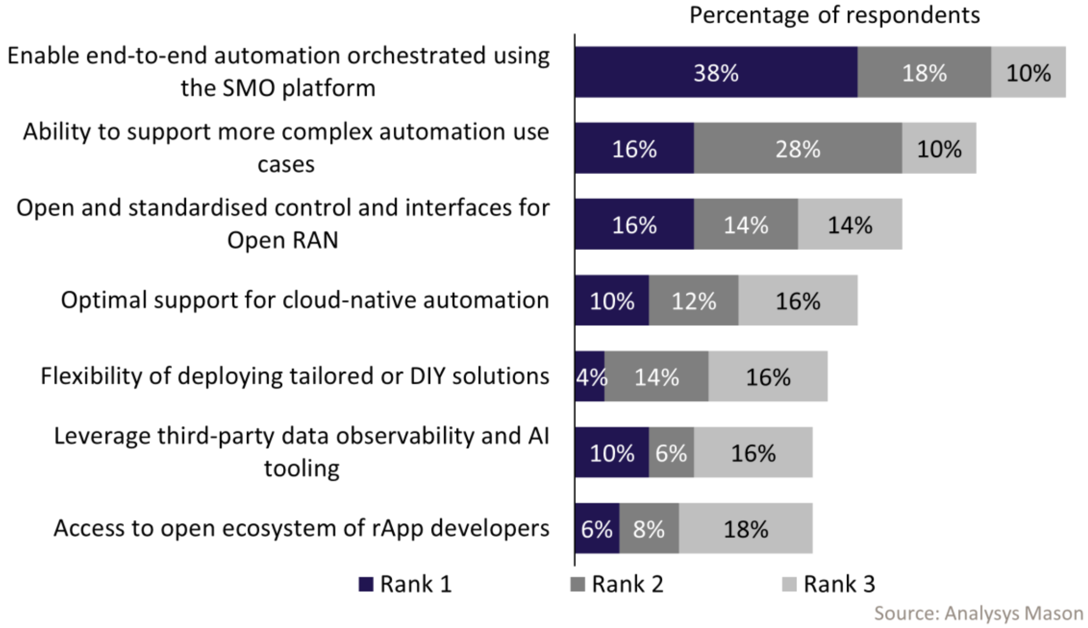
The ability to support end-to-end automation emerged as the most critical driver for rApps adoption. This is enabled by the SMO platform that hosts rApps, which supports application portability so that rApps can function and interoperate across multi-vendor, multi-technology environments (Figure 2).

> "The real value of the SMO platform lies in the consistency it brings in terms of standardized APIs and uniform interpretation of network functions and data models from various systems. This also helps us to simplify and speed up the integration effort. Building applications for autonomous networking operations is extremely complicated, so we will end up deploying an SMO platform from a large networking vendor that can support greater scales and cloud-native capabilities."
>
> - General Manager, Wireless Technologies – wholesale operator, Developed Asia–Pacific

Operators are also prioritizing rApps specifically for their ability to support more complex automation use cases. This reflects a growing recognition that traditional SON systems cannot meet the demands of the sophisticated automation required for advanced RAN operations (Figure 2).

> "We are using rApps in operational areas where data is complete, where there are legacy tools that need replacing or where there is a need to support complex automation use cases. We expect rApps to eventually replace traditional SON systems. Using rApps from a large networking vendor like Ericsson offers better results because their algorithms are more mature and trained on extensive data. These vendors also have more experience with operators globally."
>
> - Director of Autonomous Networking – Tier-1 operator, Western Europe

Figure 2: What are your main drivers for using rApps to resolve automation challenges over other RAN automation solutions (i.e. SON)?



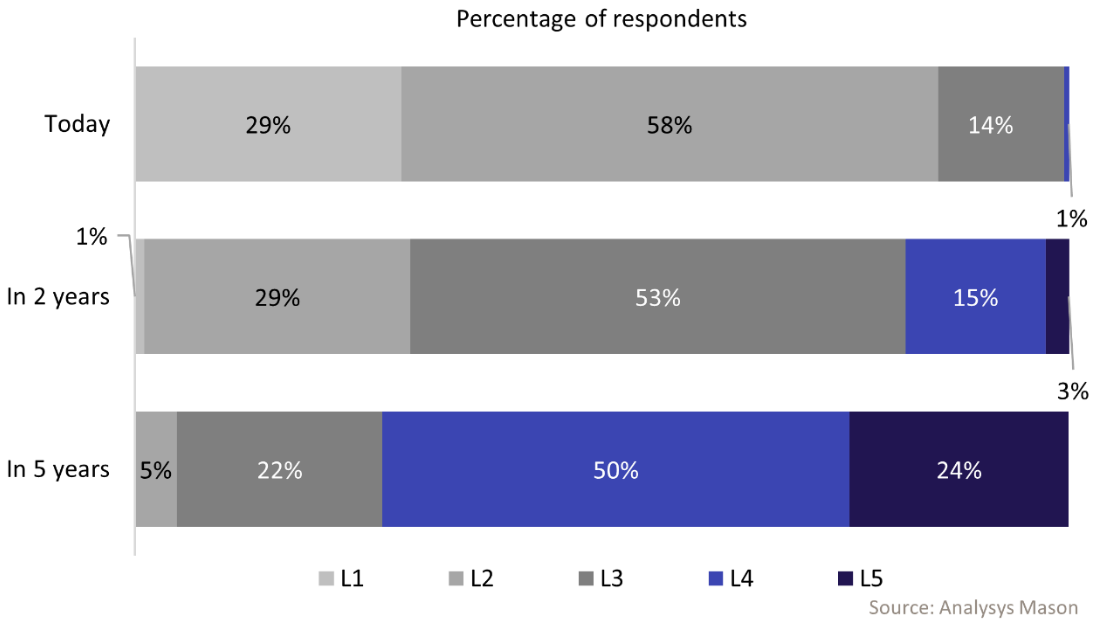
Operators also view the openness of the SMO platform as a major advantage. It provides standardized control interfaces for vendor-neutral automation, eases network data exposure to third-party analytics and AI tools and supports a broader ecosystem of rApp developers. This allows operators to source solutions from multiple partners and accelerate innovation.

> "The SMO platform helps both us and the wider ecosystem to scale and unlock more advanced automation use cases. We also need your rApps tied into your data lake, your other data sources and even your provisioning systems. That's when we need an SMO platform from a large vendor like Ericsson to deliver that level of integration at scale."
>
> - General Manager, Wireless Technologies – wholesale operator, Developed Asia–Pacific

3.2 The AN journey

Operators are navigating the transition towards higher levels of AN. 58% of operators are at Level 2 (partial autonomy) today, but there is a high expectation that they will accelerate maturity levels within a short timeframe. Over the next two years, operators expect a substantial movement towards Level 3, with adoption rising from 14% to 53%. There is a strong consensus among 50% of operators that they will leap to Level 4, and a further 24% believe that they will reach Level 5 autonomy in the next 5 years (Figure 3).

Figure 3: Operators' AN level today, in 2 years and in 5 years



TM Forum has identified a number of RAN processes, including fault management and optimization, as high-value use cases for AN. However, the level of technical detail and operational requirements to achieve higher levels are still being worked out by the industry. rApps are emerging as a practical vehicle to deliver these RAN domain-specific capabilities for autonomous operations, given their ability to flexibly deploy higher levels of automation for various use cases.

3.3 Integrating agentic AI with rApps will help operators leapfrog AN journeys

Our survey results indicate that agentic AI is a critical enabler for achieving AN goals for the majority of operators. Agentic AI supports AN by following a closed-loop automation chain using perception, analysis, predictions, decision-making and execution actions. GenAI plays a complementary role to agentic AI; it interprets high-level intent and translates it into service policies and actionable tasks that agents can execute.

90% or respondents view Agentic AI as either a "Significant" or an "Absolutely critical" enabler of L4/L5 autonomy and intent-based networking.

Agentic AI and GenAI enhance the autonomy of RAN automation when integrated with the rApp framework. They co-ordinate rApps and allow them to autonomously optimize RAN operations under dynamic network conditions with greater intelligence.

94% of operators plan to deploy agentic AI to support orchestration for multiple rApps within the next 2 years.

This suggests that the next 24 months will be the scale-out period for AN, as the industry moves from pilot programs to live, agentic ecosystems.

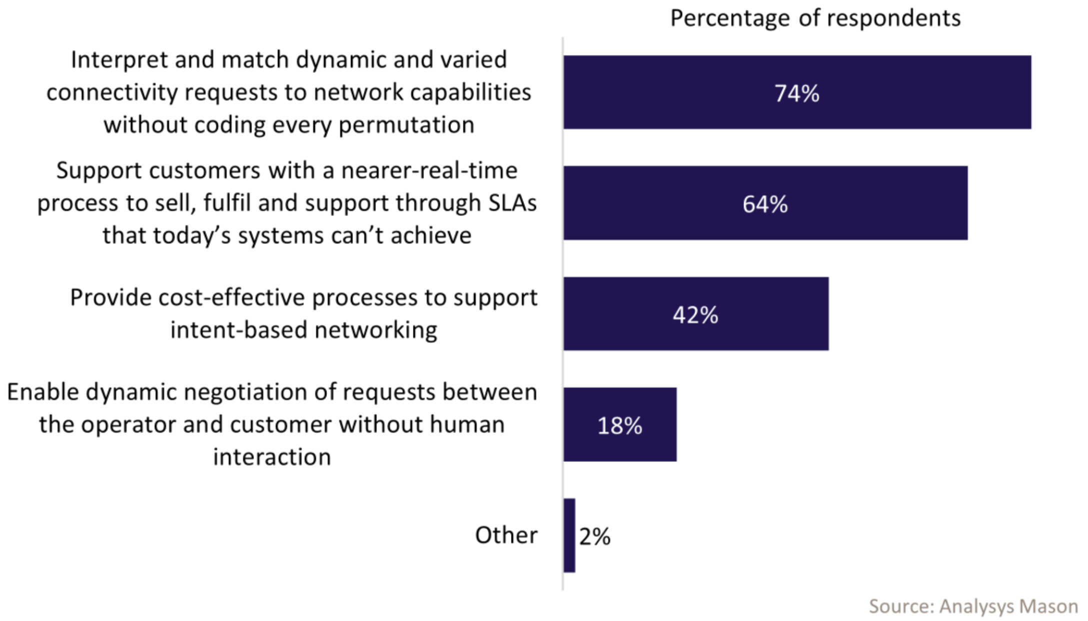
3.4 Intent-based networking is the architectural foundation for AN

Intent-based networking aims to abstract network complexity and shift towards goal-oriented, outcome-focused operations by translating business and service objectives into network policies and actions. However, as networks grow more complex and dynamic, traditional rule-based approaches are increasingly unable to scale, and translating high-level intent into network configuration parameters is becoming a major technical challenge. This has created a growing need for agentic AI solutions to support more adaptive, intent-driven service delivery. Agentic AI is being implemented as a translation layer, bridging the gap between high-level customer intent and network-level technical execution without relying on extensive manual programming.

74% of operators expect to have a fully functional intent-based architecture deployed by 2027. This shows a strong alignment between AI readiness and architectural shifts.

74% of operators ranked the top reason for the use of agentic AI in supporting intent-based networking as the ability to match varied connectivity requests to network capabilities without coding every permutation. This confirms a major pain point: the complexity and expected volume of advanced use cases make manual rule-writing physically impossible. The ability to deliver near-real-time fulfilment and SLA assurance closely followed as the second most popular reason. Current systems are too slow to react to the micro-fluctuations of continuously changing network condition services, such as in dynamic slice-based services. Agentic AI provides capabilities such as predictive analytics, autonomous remediation, intent-aware optimization and self-healing and remediation to perform corrective actions and ensure SLA compliance without human intervention. Interestingly, cost-effective processes scored lower (only 42% of operators selected this as the primary reason), which suggests that the immediate priority is technical feasibility rather than cost cutting (Figure 4).

Figure 4: What are the primary reasons an agentic AI approach is necessary or highly advantageous for supporting intent-based networking?



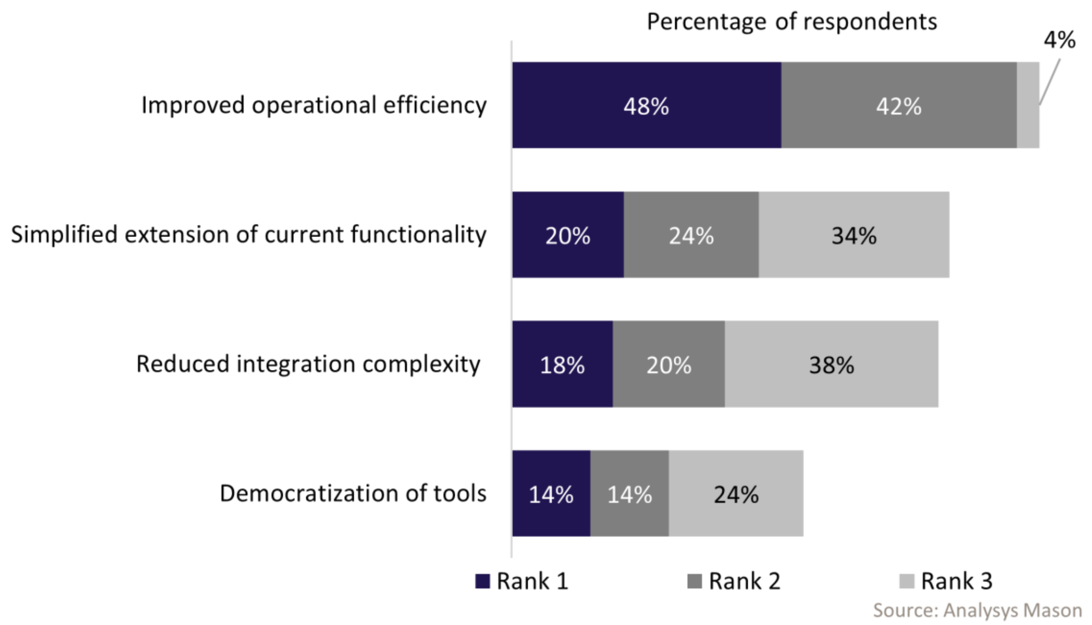
3.5 Natural language interfaces are seen as a defining feature for supporting autonomous operations

The shift to intent-based networking is tied to the evolution of the user interface. As network complexity increases, the ability for human operators to interact with the system using natural language (e.g. 'Talk to the Network') has moved from a futuristic concept to an operational requirement. Operators view natural language interfaces (NLIs) as an important enabler for improving how network engineers and operations teams interact with increasingly complex network systems, allowing them to access data and solve issues faster with conversational queries and direct instructions.

> "Natural-language tools are becoming essential for us. We can ask complex planning questions in plain English (such as how many radios we need in a county) and get answers immediately. It means engineers don't have to dig through dashboards or write SQL anymore; the system handles that and even generates the queries for us. It's changing how we work."
>
> - RAN Engineering Lead – Tier-1 operator, North America

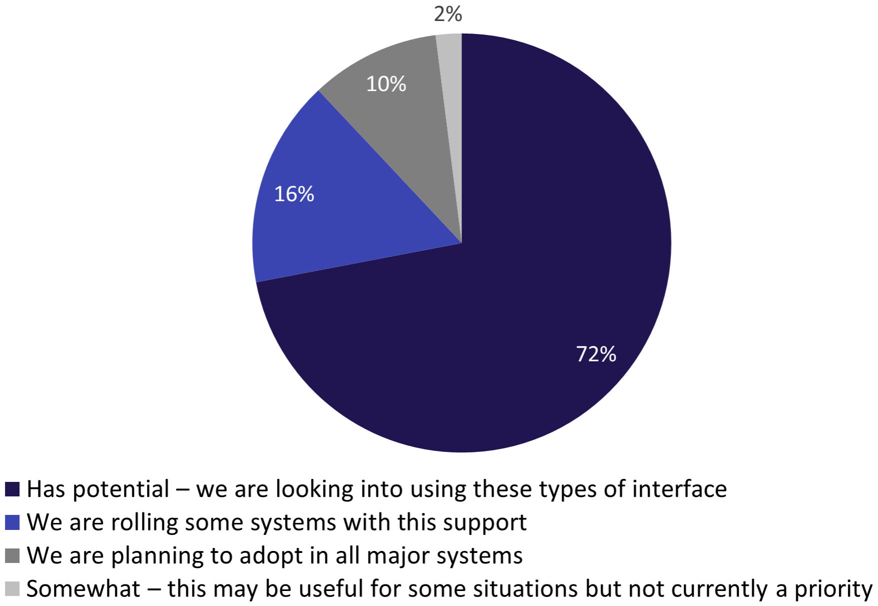
The most important benefit is improving operational efficiency; 90% of operators ranked this as one of their top two benefits (Figure 5). Operators have also highlighted the ability of NLIs to simplify the extension of existing capabilities to enable the introduction of new and more sophisticated automation functions without the need for specialized programming expertise. Another benefit is the reduction in integration complexity: NLI systems can automatically handle the translation of tasks between diverse network platforms and data models, which reduces the need for custom API development and integration. A small proportion of operators also noted that NLIs help to democratize advanced tools, allowing a broader segment of the workforce to leverage data-driven insights and automation workflows that were previously accessible only to specialists.

Figure 5: What are the main benefits your organization sees in adopting an NLI for network automations?



Operators view network optimization as a primary process for improving operational efficiency, and 98% expect NLIs to have significant potential for network optimization. 16% of operators are already rolling out systems with NLI support, and 10% plan to adopt it across all major systems (Figure 6).

Figure 6: For network optimization, how desirable are solutions that provide an NLI (e.g. 'Talk to Network')?



Source: Analysys Mason

4. rApp sourcing strategies

4.1 The sourcing of rApps will comprise a diverse range of suppliers and in-house efforts

Many operators rely on traditional vendor-managed models, even though the industry's long-term vision favours an open ecosystem. Currently, "automation" remains defined by a collaborative but structured dependency on established partners to handle the heavy lifting of development, enabled by change requests and vendor-led roadmaps.

> "Wherever possible, we offload development to rApp partners or SMO platform providers. We submit a change request process with the vendor when we need additional functionality or new capabilities."
>
> - Director of Autonomous Networking – Tier-1 operator, Western Europe

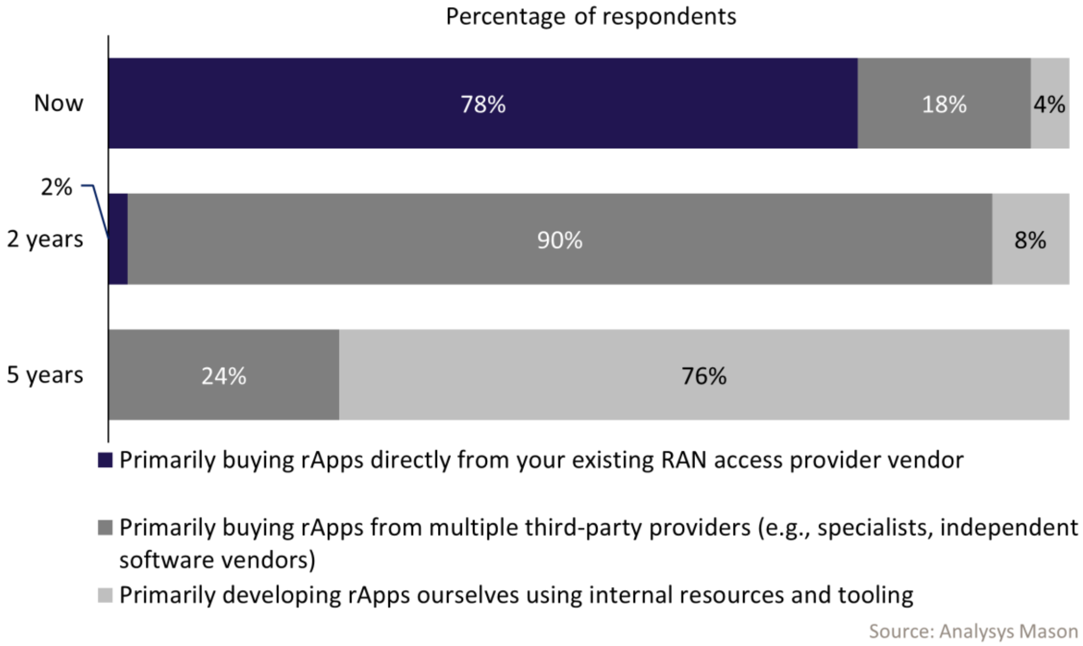
Operators are increasingly valuing openness of supply and are prioritizing the flexibility to source specialized rApps from third-party providers or develop them in-house, rather than being constrained by a single RAN vendor's rApp ecosystem.

"We don't want to be locked into a single vendor's ecosystem. [We are] pushing hard to develop our own rApps in-house, and we're also engaging with third-party developers who bring new ideas that we can tailor to our use cases. That flexibility is critical for us."

- RAN Engineering Lead – Tier-1 operator, North America

There is a strong ambition to realize a diverse, open ecosystem of rApps, and operators are anticipating a massive swing over the next 2–5 years towards a mix of third-party and in-house rApps (Figure 7).

Figure 7: Sourcing strategy of rApps for RAN automation



4.2 The shift to SaaS for embracing live software

One of the most noteworthy findings is the pronounced shift toward SaaS-based licensing models (Figure 8). This trend extends beyond a change in financial restructuring to a technological transformation driven by the move towards 'live software'. RAN automation is becoming increasingly dependent on real-time access to evolving large language models (LLMs), training data and elastic cloud-computing resources to support continuous retraining, optimization and the integration of new data sources.

72% of operators expect that a pure SaaS-based model will be the primary licensing model for rApp deployment as they advance towards higher levels of RAN automation (Figure 9).

Figure 8: Given that RAN automations and rApps increasingly require 'live software' (i.e. access to LLMs, training data, cloud compute), do you anticipate that the commercial model for software will increasingly require a subscription element associated with it?

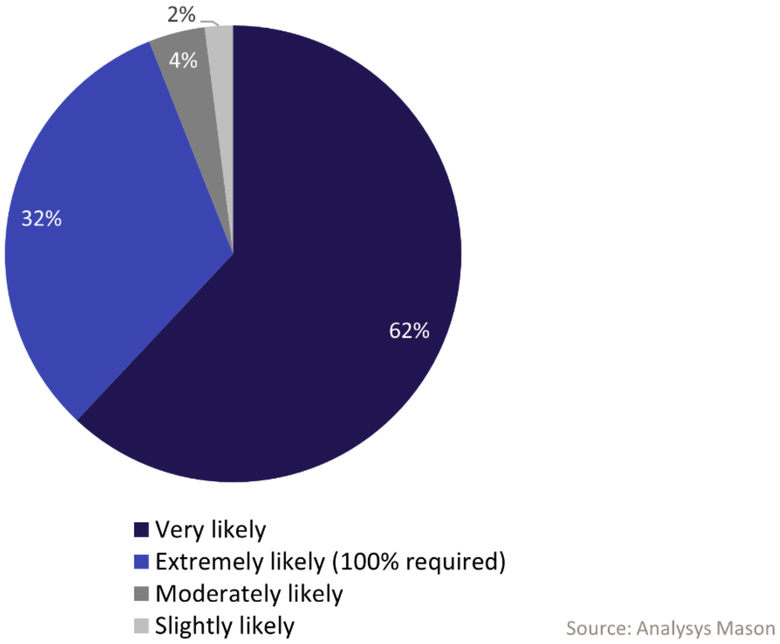
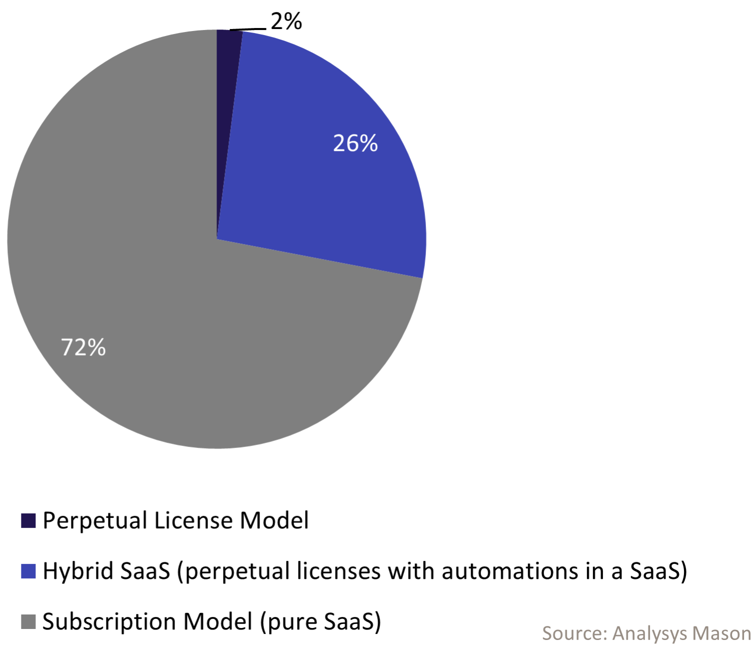
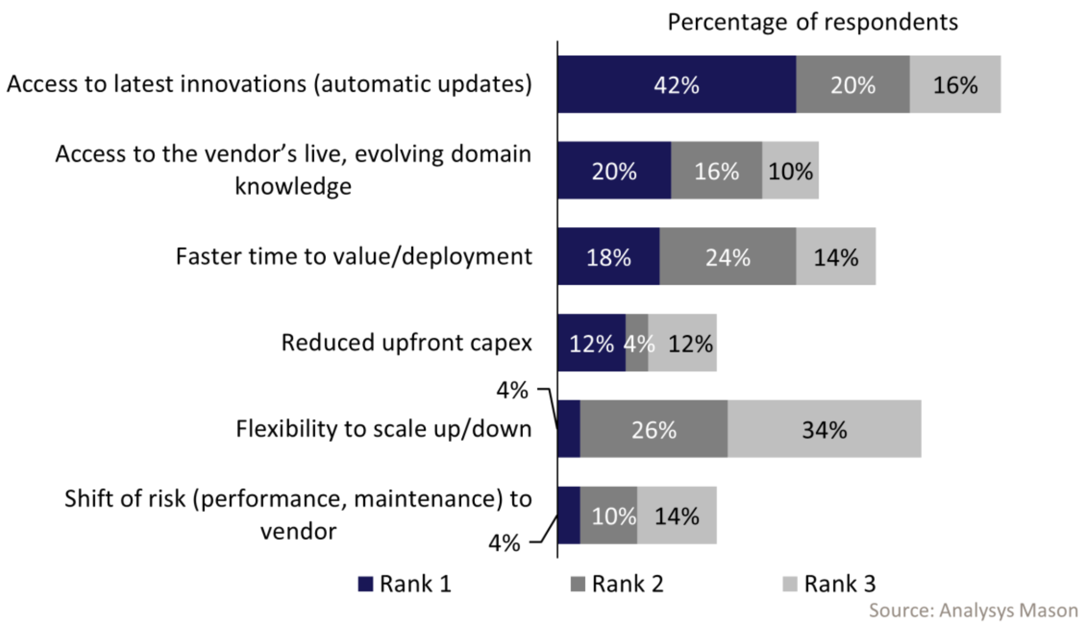


Figure 9: Which of the following licensing models do you anticipate will become the primary one for rApp deployment as your organization advances towards higher levels of RAN automation?



Operators expressed that the top benefit of the SaaS model is providing real-time access to the latest innovations, such as AI and computational resources, and enabling automatic updates (Figure 10). This reduces the operational complexity and capital intensity associated with building and maintaining advanced AI and cloud infrastructures in-house. We also see that SaaS transforms operators' motivations from simply just "buying a tool" to "subscribing to an outcome", where faster time-to-value and deployment is indicated as the second most important benefit. This aligns with operators' ambitions to accelerate the roll-out of new automation capabilities and continuously adapt to new update cycles with minimal friction. The SaaS model also provides access to richer and more granular network data, including real-time telemetry and unified observability of network conditions. This is necessary to support unified control and orchestration for more complex automation use cases (Figure 10).

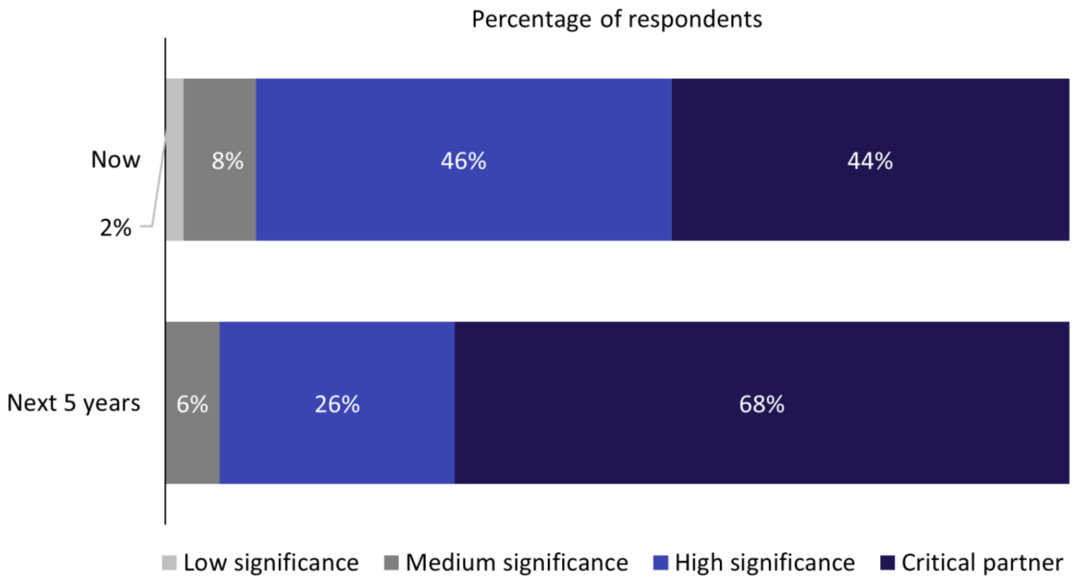
Figure 10: What benefits does your organization see in an as-a-service model for RAN automation?



4.3 Public cloud platforms are a critical success factor for scaling advanced automation

Operators increasingly require greater computing resources to support more advanced AI capabilities as they pursue higher levels of automation. Public cloud partnerships are becoming central to automation strategies because they enable faster innovation and greater scalability (Figure 11).

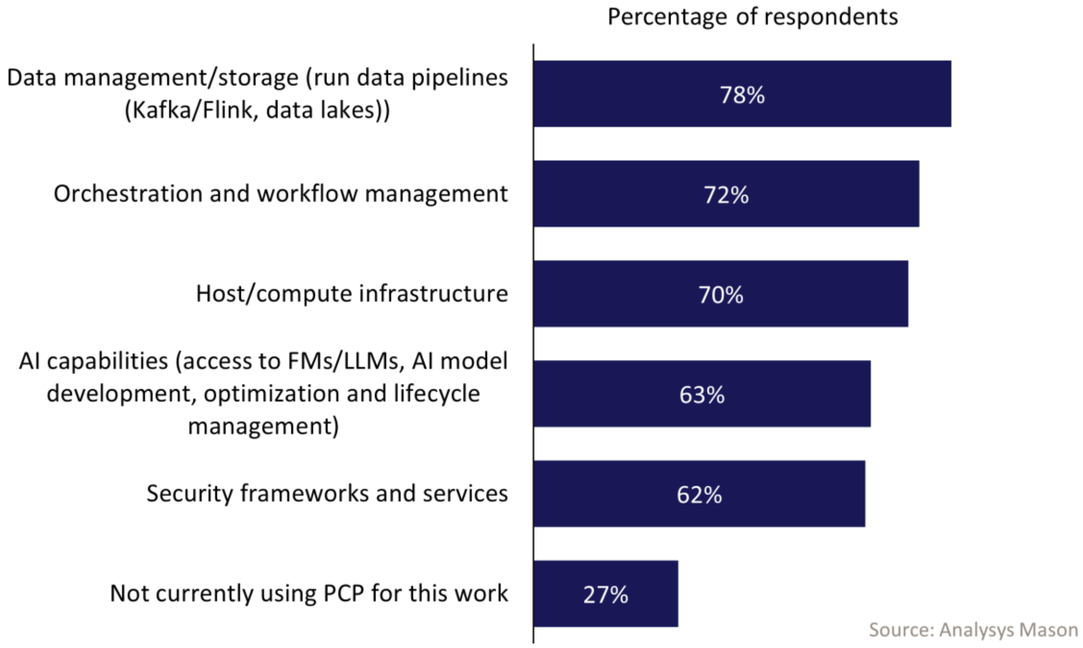
Figure 11: How significant are public cloud platforms in your organization's journey towards achieving AN L4/L5?



Source: Analysys Mason

PCPs have traditionally been used for cloud-hosting environments and compute infrastructure. However, operators expressed that the top two benefits of PCPs were that they provide support for advanced data management and storage, and for orchestration and workflow management, when it comes to network automation and AI workloads. In addition, 63% of operators expressed that they are using PCPs to gain access to foundation models and LLMs and to AI model development and optimization. PCPs are well positioned to support these capabilities at scale, which makes them strategic partners in accelerating AN Level 4/5 deployments (Figure 12).

Figure 12: Which of the following functions/capabilities do you now use a public cloud platform for in your network automation/AI work?

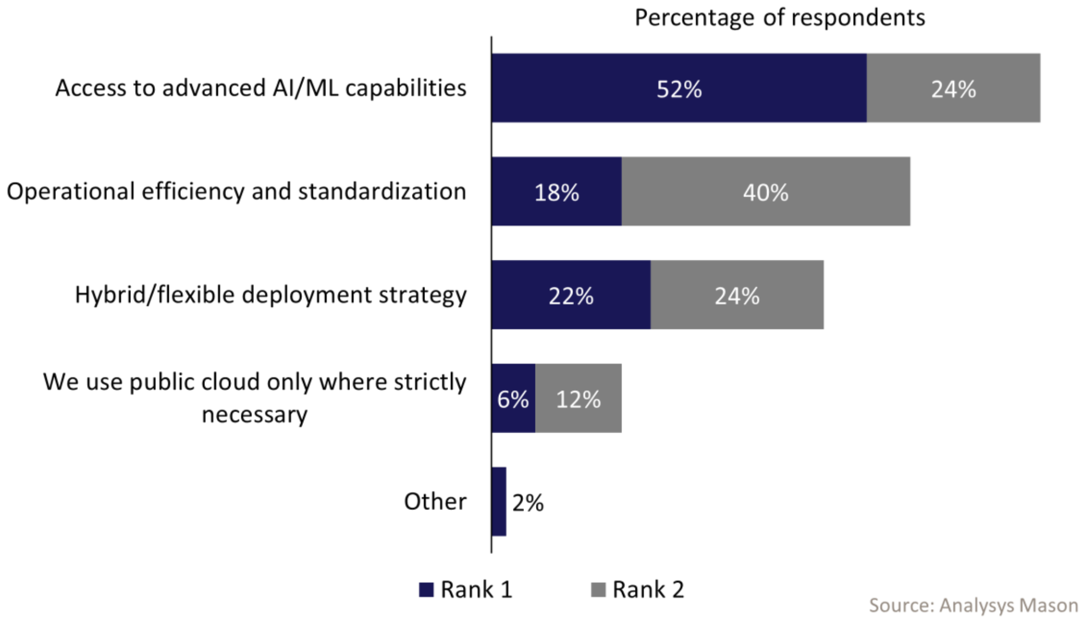


"Using the public cloud makes it easier to increase network autonomy because PCPs provide automation capabilities out of the box – though in some cases we need more support for cross-domain correlation. For example, if we have a network core function in the cloud, we can manage the cloud with PCPs' solutions; but if we need to correlate issues from the public cloud with the network functions, we need a higher-layer platform or tooling."

- Director of Autonomous Networking – Tier-1 operator, Western Europe

However, these reasons are starting to shift as operators adopt more advanced AI for network automation, which demands greater AI-centric capabilities than traditional automation workloads. Accordingly, 76% of operators ranked access to advanced AI/ML capabilities as one of their top two strategic reasons for using public cloud platforms to deploy network automation and AI workloads (Figure 13). Operational efficiency and standardization is the second-strongest strategic driver, which reflects operators' need to streamline automation workloads by leveraging cloud-native tools such as CI/CD, DevOps, MLOps and other orchestration frameworks.

Figure 13: Which statement best describes the primary strategic reason your organization uses public cloud platforms for your network automation and AI workloads?



These public-cloud capabilities will provide the foundational infrastructure required for scaling both agentic AI and GenAI. They will also ensure that operators can continuously train the AI models that support rApps in order to execute more intelligent, closed-loop automation at scale and accelerate the progression towards higher levels of autonomy.

5. Summary

The report concludes that the journey to advance RAN automation to AN Level 4/5 requires a transformation in network and operational architecture, along with the adoption of new technology, software-delivery models and ecosystem partnerships.

- rApps hosted on SMO platforms are emerging as the primary mechanism for advancing towards AN Level 4 by enabling end-to-end, multi-vendor automation at scale. Openness is becoming an architectural requirement because it allows operators to integrate best-of-breed and third-party rApps. Operators expect a diverse ecosystem of rApps sourced from vendors, third parties and in-house teams, which reflects a shift away from single-vendor models.
- Advanced AI, particularly agentic AI, is now viewed as critical. Intent-based networking is gaining momentum as the operating model for future networks. NLIs are rapidly becoming mainstream for improving operational efficiency and supporting advanced automation.
- There is a high expectation that SaaS will become the dominant commercial model for rApps in the medium term, offering continuous updates, faster time-to-value and access to the vendor’s live domain expertise. PCPs are becoming strategic partners because they offer the scalable compute, data management and advanced AI tooling needed to support higher levels of autonomy.

6. Appendix

Methodology and data collection

The insights presented in this report draw on several sources, including:

- a structured survey of 50 Tier-1 CSPs
- an extensive questionnaire and interviews that were conducted with five RAN automation professionals from Tier-1 CSPs.

The survey was conducted via computer-assisted telephone interviewing (CATI). This method was selected to ensure high data quality and to allow for the verification of respondent expertise within the RAN automation sector. The fieldwork was conducted between 5 January 2026 and 27 January 2026, targeting a sample of C-suite executives and senior leadership within the telecommunications and technology sector.

To ensure a representative and unbiased dataset, the following protocols were observed.

- **Screening:** all respondents were screened to confirm they possessed strategic or technical oversight of network evolution, specifically meeting the following criteria:
  - **Executive or management seniority:** they held a leadership role ranging from managerial level to the C-suite (e.g. CTO, CIO or Head of RAN Automations).
  - **Direct strategic involvement:** they confirmed personal involvement in decision-making, planning or technical implementation for RAN automation or AN.
  - **Technical literacy (AN framework):** they demonstrated familiarity with the TM Forum AN framework for assessing automation maturity.
  - **Active project engagement:** they belonged to an operator with RAN automation initiatives (including rApps or similar applications) currently in production, pilot or development.
  - **Domain expertise:** they possessed established knowledge of advanced automation concepts, specifically intent-based networking and agentic AI.

- **Quality control:** to ensure the integrity of the research findings, a multi-layered quality-control process was implemented. This included systematic logical checks for skip patterns and data-entry errors, as well as specific audits of 'stretching' data points (for example, verifying entries reporting Level 4 or Level 5 AN maturity and SaaS adoption rates above 50%) to confirm they aligned with established industry trends. The process further combined voice call audits and real-time observer feedback with continuous de-duplication and company-level verification to maintain a dataset that is 100% accurate.

The resulting data provides a statistically robust foundation for the perspectives shared in this report regarding Ericsson's RAN automation trajectory.

To further refine our perspective, the CATI survey was accompanied by a series of in-depth interviews with five RAN automation professionals from Tier-1 CSPs.

- Objective: these sessions were designed to pressure-test our core hypotheses and validate preliminary findings from the survey data.
- Insights: these conversations provided nuanced context and direct industry quotes, ensuring that the report's conclusions reflect the real-world operational challenges and strategic priorities of leading global operators.

7. About the authors

Justin van der Lande (Research Director) leads Analysys Mason's *Operational Applications* practice. He specialises in business intelligence and analytics tools, which are used in all telecoms business processes and systems. In addition, Justin provides technical expertise for Analysys Mason in consultancy and bespoke large-scale custom research projects. He has more than 20 years' experience in the communications industry in software development, marketing and research.

Dennisa Nichiforov (Principal Analyst) leads Analysys Mason's *Automated Assurance* and *Customer Engagement* research programmes, which are part of the *Operational Applications* practice. Her research focuses on how advanced technologies and intelligent AI/ML-driven systems are transforming network and service assurance by enabling real-time, end-to-end visibility and control across highly dynamic and complex 5G architectures to enable autonomous operations. She also investigates the critical intersection of these advances with customer engagement systems, and assesses how they enable new service monetisation and enhanced customer experience. Her work identifies opportunities and threats for the service providers and the vendor ecosystem in this evolving technology landscape.

Michelle Lam (Senior Analyst) is a member of our *Operational Applications* practice. She leads the *Network Automation and Orchestration* programme. Her research focuses on challenges in the evolution to next-generation networks that are highly autonomous and orchestrated by software-defined networking and network virtualisation principles. In addition, her research provides critical insights into the prospects for established and emerging network management, automation and orchestration products and related professional services.