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The Foundation for Network Monetization

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Having made significant recent investments in network infrastructure, Communications Service Providers (CSPs) need to monetize such investments through new revenue streams from both existing and new sources. With consumer revenues under pressure, focus turns more to the wholesale and enterprise opportunity and, in particular, to communications-enabling applications in vertical industries (e.g., healthcare, public safety, etc.) to afford such applications greater reach or fundamentally enable new capabilities to drive higher value to their end customers. In turn, the opportunity for CSPs is to command a greater share of that increased revenue pie, but only if they can meet the needs of such vertical industry applications, including providing dynamic, on-demand connectivity with the appropriate reach, cost, and quality of service (QoS) for ease of consumption by such applications.

This requirement drives considerable change in CSPs, with an emphasis on end-to-end automation at the business, customer, service, and network layers, something several standards organizations (e.g., ETSI, 3GPP, TMF, etc.) have defined to various degrees. The foundation of this is the concept of autonomous networks and operations, where networks can manage themselves with minimal human intervention, enabled by AI operations (AIOps) that use data analytics, automation, and AI to automate and improve IT operations. This approach drives the desired financial outcome of increased revenues and reduced costs.

Finding the right starting point: AIOps as a foundational step

For the network itself, a cloud native foundation is critical to this transformation. It offers the agility, automation, and scalability—in addition to real-time observability—needed to manage modern network demands efficiently. By embracing cloud native architectures, CSPs can streamline operations, accelerate innovation, and enable new business models that drive long-term growth in the 5G era. The appropriate exposure of network capabilities via network Application Programming Interfaces (APIs), in particular, plays a pivotal role by enabling enterprises and developers to harness 5G's advanced capabilities such as differentiated connectivity, ultra-low latency, and precise location services. These capabilities empower the creation of innovative business models, while also opening new revenue streams for CSPs through API monetization.

At the same time, AIOps must evolve from buzzword to embedded capability. The increasing diversity of data formats, interfaces, and network behaviours demands that AI be embedded natively within products and platforms, not bolted on externally. This inherent intelligence enables real-time insights, proactive management, and context-aware decision-making, key enablers of self-optimizing, revenue-generating networks in the 5G era.

This highlights the importance of embedding AI natively within the network components themselves, empowered by analytics and automation to effectively scale with AI growth rather than relying on external AI tools, paving the path towards an autonomous network. This serves as the intelligent backbone of modern CSPs, enabling resilient, efficient, and revenue-generating 5G ecosystems.

Why have an AI embedded core design framework?

AIOps can be deployed to help reduce the operational burden on CSPs by automating routine tasks, proactively identifying and resolving issues, and optimizing network performance. This can not only enhance efficiency but also improve service reliability and customer satisfaction.

Having context awareness is crucial for enabling network components to make the right decisions on their own. This level of accuracy and relevance is often difficult to achieve using external tools, as they may lack the system's internal perspective and real-time context. An in-built framework can act as a living, learning planning assistant, helping streamline decision-making, improve accuracy, and accelerate time-to-deploy. Analytics and automation within this framework make it real-time actionable, paving the way towards an autonomous network.

Some of the advantages of AI embedded design in network components are enumerated below (see Figure 1).

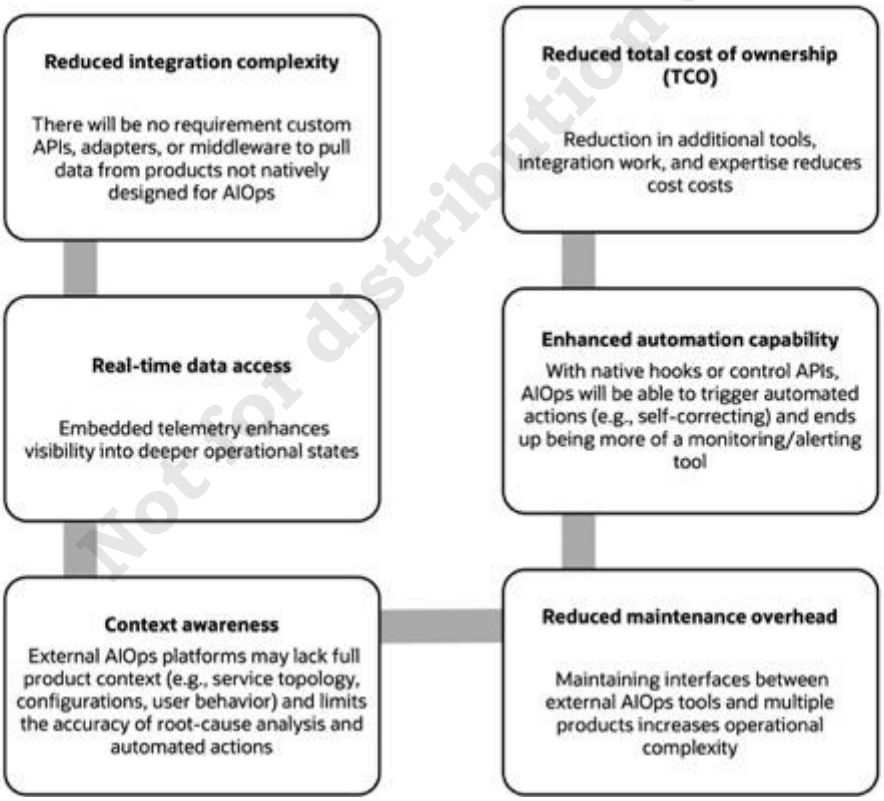

Figure 1: Advantages of AI embedded design in network components

click to enlarge

What is the starting point of AIOps in a CSP network?

While Radio Access Network (RAN) and Transport make up the majority of the network infrastructure in terms of scale and cost, it is the core that serves as the enabler of differentiated services, allowing CSPs to unlock new revenue streams and monetize the network more effectively. Given that the core represents a smaller portion of the overall network, it presents a manageable and strategic starting point for piloting AIOps initiatives. Successful implementation in the core can then be scaled to the broader RAN and Transport domains, enabling a phased and low-risk AIOps deployment.

Network planning as a representative use case

Using network planning as a representative use case, we can explore the multiple factors that contribute to building an effective and scalable network infrastructure. Network planning is a strategic process that involves decisions spanning various functional domains within the network ecosystem. These include traffic analysis, which helps identify current usage patterns and anticipate future demand, capacity planning, which helps the network handle projected loads without degradation, and QoS, which prioritizes critical applications to maintain performance under varying traffic conditions. Furthermore, the design of network topology, adherence to security standards, and ongoing monitoring and optimization also play essential roles in maintaining the network's reliability and resilience.

By addressing these diverse yet interconnected factors, organizations can design a network that not only meets current operational needs but is also prepared for future scalability, performance, and security challenges. In the whole process, data plays a key role—quality of data, data aggregation, filtration, and correlation are absolutely essential.

At the core is a Cloud Native framework—such an approach is crucial for maintaining data quality because it enables CSPs to build and deploy scalable, reliable, and efficient data management systems. By leveraging cloud computing, microservices, and containers, cloud native architectures offer flexibility, agility, and the ability to handle large volumes of data while maintaining data integrity and accuracy.

Embedding AI in the network components enables contextual awareness, which is essential to have direct access to real-time data and operational context. External tools, by contrast, often lack this depth of insight, which can lead to less accurate or suboptimal decision making. Context awareness, analytics, and automation are essential for autonomous system decision-making.

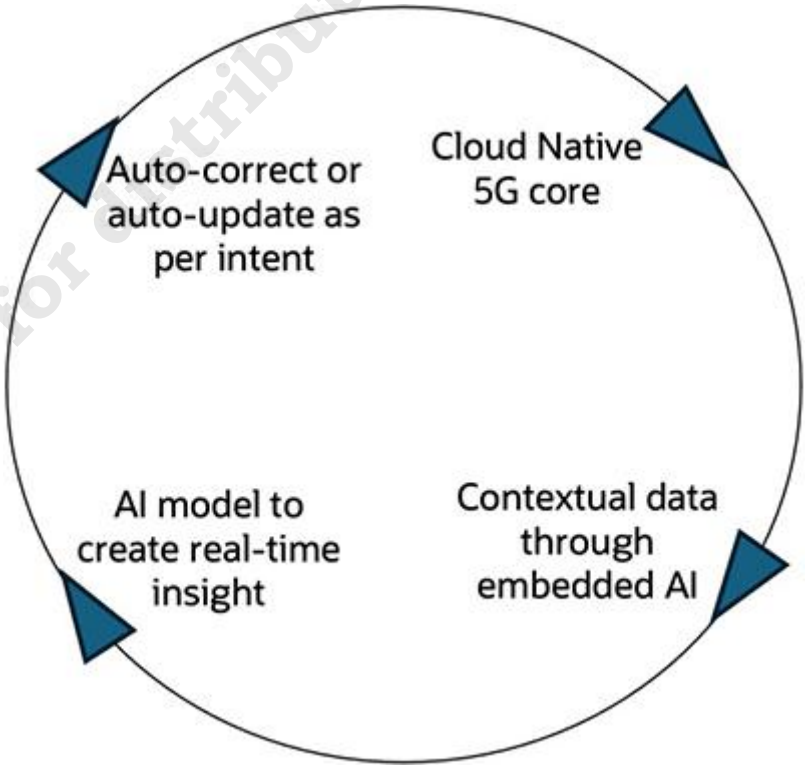

Figure 2 - Turning insight to auto-correct/auto update
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What's next?

CSP will need to select the right technology partner having expertise in cloud, cloud native environment, and data management—one who can support them in their journey towards this autonomous network see Figure 2, above:

Follow a full-scale approach

As CSPs chart their course towards an increasingly automated and autonomous target state, a first foundational step may well be the adoption of AIOps. To that end, it is becoming clear that if data is the foundation, then actionable insight is the enabler for AIOps. However, achieving full visibility across all components by aggregating data from various sources is challenging due to the complexity and diversity of the network environment. Without clean, comprehensive data and real-time system visibility, AI-driven operations cannot deliver actionable insights or automation at scale. AIOps demands seamless integration of telemetry, logs, metrics, and events from heterogeneous systems. In the journey towards an autonomous, zero-touch network, CSPs need to lay the foundation of a cloud native network with in-built AIOps, powered by analytics and automation to realize the effective monetization of all network investments.