



www.pipelinepub.com

Volume 20, Issue 10

A Foundation for the Future of Communications

By: [Andrew De La Torre](#)

Communications service providers (CSPs) today are facing significant challenges in competing with digital disruptors and traditional competitors. Success in this market relies heavily on IT and business agility, including the ability to quickly capitalize on emerging opportunities and identify new revenue streams. In this article we will identify four foundational elements to unlocking new opportunities for service providers and charting a path beyond the consumer market: cloud native, open industry standards, analytics/AI, and automation.



Building upon a Cloud Native Framework

As an enabler for Industry 4.0, CSPs must undergo significant transformation. To truly unlock the potential of 5G, a behavioral shift is required in how they expose network capabilities and participate in ecosystems. The journey begins with adopting a cloud native framework and leveraging cloud native applications for everything from the 5G core to policy engines, network automation and analytics, ordering, provisioning, billing, and operations automation. These capabilities are critical to efficiently operating and scaling 5G and beyond in the new era of disruption, and rapidly offering and monetizing digital services for the enterprise market.

A 5G cloud native core and cloud native network operations are essential for CSPs to achieve better measurement, visibility, and observability. This approach enables them to make informed business decisions, such as identifying new revenue streams based on behavior and insights. While some of this could be achieved with a 4G evolved packet core, it would be limited and costly.

As communications become increasingly critical for future innovation, many enterprises and developers seek full access to their data and control over their private networks. They want to consume such services with the ease and simplicity of consuming anything else on the cloud today – through a marketplace. This vision aims to differentiate operators from those whose primary offering is connectivity. Developing and implementing platform capabilities enables CSPs to co-innovate and co-create value with broader digital ecosystems, providing support for process automation and exposing insights to partners to enhance business decisions. This one-stop shop, marketplace vision includes network capabilities, cloud compute capabilities, and industry vertical applications from partners with deep enterprise expertise.

Composable networks leveraging cloud native technologies are crucial in realizing this vision. By

breaking down network functions into modular, reusable components, CSPs can create a flexible, scalable infrastructure that adapts to changing demands and fosters innovation. This approach not only streamlines operations but also accelerates the development and deployment of new services, ensuring that CSPs remain competitive in a rapidly evolving market.

Observability at the network level is another pivotal component enabled by a cloud native framework. For example, leveraging analytics and machine learning, RAN Intelligent Controllers, and advanced policy control functions and network exposure functions, CSPs can find unique and innovative ways to unleash the power of data and look at mobility management like never before. This level of observability allows CSPs to proactively monitor network performance, identify potential issues before they impact customers, and optimize network resources to deliver superior service quality.

Embracing Open Industry Standards

The move to the cloud is significant, and the challenges are often underestimated when it comes to transitioning to open source technology. Open source adoption requires CSPs to rethink their existing business practices and embrace new models of operation. This includes moving to a DevOps approach that emphasizes continuous integration and continuous deployment (CI/CD), allowing for rapid updates and improvements to software and systems.

Incorporating open industry standards also means adopting a collaborative mindset, where CSPs work closely with industry partners, standards bodies, and the broader open source community. This collaboration fosters innovation and ensures that the solutions developed are robust, interoperable, and capable of meeting the diverse needs of the telecommunications sector.

Furthermore, standardization of open source tools and frameworks can lead to significant cost savings for CSPs. By leveraging widely adopted open source solutions, CSPs can reduce their reliance on proprietary technologies, which often come with high licensing fees and vendor lock-in. Instead, they can take advantage of a rich ecosystem of tools and resources that are continually being improved and updated by a global community of developers.

Leveraging best practices, tooling, and processes from hyperscale cloud partners that have become de facto standards is crucial. Standard ways to deploy on Kubernetes, CI/CD tooling, and adherence to 3GPP standards are essential building blocks. While standardizing system interactions is important, maintaining an ecosystem that keeps pace behind the scenes is vital for interoperability. This involves: 1) *de facto standards*: practical methods that people actually use; 2) *real standards*: established by bodies like 3GPP; 3) *frameworks*: like TM Forum's Open API and ODA, which facilitate interaction between systems.

Optimizing Outcomes with Analytics

Analytics play a vital role from the early stages of planning and design. For example, by leveraging analytics early on, carriers can prioritize locations and define deployment parameters with the most potential to generate revenue. This enables providers to be more purposeful with their resources, minimizing the risk of deploying expensive network assets in unsuitable regions.

Once the network is operational, data analytics can help carriers optimize business outcomes and customer experience. Cohesive analytics from planning through operations equip carriers to react better to changes, challenges, and opportunities. Carriers can pull analytics from multiple sources, including customer data, third-party data, and network-generated data, to pinpoint areas of concern and optimization in the network, operations, and services layers. Benefits include a more personalized customer experience, better managed supply chain, informed financial decisions, and improved quality assurance.

The integration of analytics throughout the network lifecycle enables CSPs to gain a comprehensive understanding of their operations and customer behaviors. This holistic view allows for more effective decision making and the ability to anticipate and respond to market trends and customer demands.

For example, the 3GPP Network Data Analytics Function (NWDAF) standardizes data collection and

consumption within the 5G standalone core network. This enables use cases designed based on expected outcomes and anomalies while monitoring network slice load levels. Examples include Quality of Service (QoS) sustainability, service experience computation and prediction, user equipment mobility analytics, expected behavior prediction, and more.

By embedding analytics into the core of their operations, CSPs can unlock new opportunities for service innovation and differentiation. This data-driven approach empowers CSPs to deliver more targeted and relevant services, enhancing customer satisfaction and garnering loyalty.

Adding Agility Through Automation

Automation is critical to leveraging analytics effectively. The volume and velocity of data being generated is increasing, requiring advanced methods for extraction, cleaning, and analysis. Automation efforts were previously designed around specific outcomes or rules-based approaches, but today's insights-driven systems analyze *all* data – an unmanageable task without automation. Providers should look to hyperscalers and the open source community for tooling and services, as well as disciplines and practices.

With the 5G network operational, new revenue opportunities will arise. Insight-driven analytics can marry customer data with operational and network data to answer critical business questions. Automation creates a more agile approach for the business and can shape strategy. As CSPs compete in the enterprise space and meet consumer demands for instant gratification, automation will be crucial. A cloud native, service-based architecture lays the foundation for a data flow that enables an insight-driven system, potentially eliminating the need for human intervention.

Despite the capabilities of automation, skilled professionals in data science and engineering remain essential. Operators must identify the right team, environment, and intent, coupling data scientists with network engineers for success.

Automation also enhances operational efficiency by streamlining routine tasks and processes. This reduces the burden on human resources, allowing them to focus on more strategic and value-added activities. Automation can improve network performance by enabling real-time monitoring and adjustments, ensuring optimal service delivery.

Furthermore, automation plays a key role in supporting the scalability and flexibility of networks. As demand for services fluctuates, automated systems can dynamically allocate resources to meet changing requirements. This adaptability is crucial in maintaining service quality and meeting customer expectations in an increasingly competitive market.

Conclusion

In order to thrive in the evolving telecommunications landscape, CSPs must embrace cloud native frameworks, open industry standards, analytics/AI, and automation. These foundational elements enhance operational efficiency and scalability, enabling CSPs to innovate and create value in transformative ways. By doing so, CSPs can stay ahead of the competition, meet enterprise market demands, and secure a prosperous future in the communications industry.

Adopting a cloud native approach provides the flexibility and scalability needed to support new services and applications. Open industry standards ensure interoperability and collaboration, fostering innovation across the sector. Analytics empower CSPs with valuable insights for informed decision-making, while automation streamlines operations and enhances efficiency.

By integrating these elements, CSPs can build a robust and agile infrastructure that supports continuous innovation and growth. This strategic approach not only addresses current challenges but also positions CSPs to capitalize on future opportunities in the ever-evolving telecommunications landscape. The future of communications lies in the ability to adapt, innovate, and deliver exceptional value to customers and partners alike.