Rebuilding Operations Support Systems for the Digital Era

Abstract

Digitization continues to fundamentally reshape the telecommunication landscape worldwide. Communications service providers (CSP) are faced with reduced margins, lower average revenue per user (ARPU), and declining customer loyalty, amid mounting competition from over-the-top (OTT) players.

According to industry thought leader Tom Nolle[1], the founder of strategic consulting firm CIMI, the cost per bit for many telecommunication operators will exceed the revenue per bit by 2018. CSPs are increasingly recognizing the need to innovate around their offerings, and deliver a truly differentiated and superior customer experience. In addition, they must reimagine their business models for the emerging 'everything as a service' paradigm, and generate higher return on investment (ROI) with regard to ongoing capital expenditure.

SDN and NFV gaining momentum

At an operational level, the rapidly evolving business dynamics make it imperative for telecom companies to reimagine core business systems, enhance network efficiency, and roll out platform services.

More bandwidth is being made available to subscribers as network access and broadband connectivity evolve amid the emergence of standards such as 5G, DOCSIS 3.1, and FTTH. Technologies like virtual reality and augmented reality (AR/VR), 4K video, and the Internet of Things (IoT) are also expected to become mainstream soon. As a result, network demands will continue to grow rapidly and exponentially. For instance, AT&T recorded a nearly 150,000% increase in data traffic on its wireless network from 2007 to 2015. Providers are challenged to effectively manage the soaring data traffic on their network infrastructure, and provide consistent, high-quality service on a continuous basis.

To overcome the limitations of existing management systems and processes, and contain rising underlying costs, many CSPs have started adopting software-defined networking (SDN) and network functions virtualization (NFV). Wireline & Wireless carriers are seeking to gradually replace their current networks built on proprietary hardware and applications. With networks increasingly becoming software-centric, the framework for the underlying design and operations is being redefined. The 'people operating machines' strategy is beginning to make way for a 'machines operating machines' narrative, the policy-based administration of modern data centers being an example.

Another important aspect of the shift away from proprietary hardware-driven networks is that costs of the corresponding software are no longer viable, nor sustainable for many CSPs. This is compounded by the risks associated with vendor lock-in and the slow pace of innovation in product realization traditionally exhibited by many large independent software vendors. Hence, a number of carriers are shifting toward adoption of open-source software and modern build methodologies like Agile DevOps for SDN and NFV implementation.

Vital role of OSS

Given this backdrop, operations support systems (OSS) will continue to play a vital role as CSPs seek to enhance customer relationships and boost subscriber engagement. After all, suboptimal execution of OSS–spanning multiple functions including service delivery, fulfilment and assurance–would widen the gap between business support systems (BSS) that ensure engaging customer experiences, and the underlying networks providing innovative and traditional communications services.

In order to bridge this divide, the industry is moving toward embracing a service lifecycle orchestration layer that focuses on service management functions including abstracted service models, service inventory, service delivery orchestration, and policy control. This layer enhances OSS capabilities while providing specialized features independent of the underlying network complexity. The resulting API-enabled multi-level orchestration architecture at the customer, service, and resource layers can facilitate efficient coupling of functions and features in a flexible manner, for maximum control and automation of the service provider business. Accordingly, conventional OSS, which typically backstopped manual operations and provisioning of workflows, is evolving today to support fully automated, software-based dynamic operations and services.

The second critical mandate for OSS is to help CSPs speed up the process of delivering additional innovative services and dynamic experiences to customers post provisioning of the initial broadband 'pipe'. This would pave the way for expenditure rationalization and higher ROI, a significant opportunity considering that CSPs typically spend 65% of their revenues on costs like management, operations and administration.

In line with the altered remit for OSS, the underlying architecture and systems are being reimagined, wherein CSPs focus more on providing holistic customer experiences with agility, rather than offering just the 'turn-up' and 'shutdown' of subscription services.

Existing pain points

The complexity of traditional OSS environments remains a major issue. Many service providers deploy hundreds of systems to handle different processes related to network inventory, configuration, activation and provisioning, fault and performance management, and service quality assurance for business and technical functions.

On top of integrating these disparate systems, which entail an onerous total cost of ownership (TCO), master data management remains an arduous affair. The lack of synchronization between the various OSS silos means duplication of the same type of information across various instances. As a result, the optimization of business processes lacks an end-to-end user perspective, and is confined to merely individual services. This fragmentation impacts CSPs' ability to innovate and evolve their business processes to augment existing products, rendering initiatives to enhance customer satisfaction and improve ARPU highly cumbersome and complex. This significantly increases the risk of business targets and expectations not being met.

For example, it is commonplace to find wide-ranging duplication of data regarding subscribers, partners, products, inventories, orders, services, and other metrics, which in turn necessitates information reconciliation and synchronization before using the data for digital transformation.

Hence, a simplification of the OSS architecture is absolutely critical for CSPs to be able to successfully, and swiftly, address the dynamic expectations of their digitally empowered customers.

Reimagining the OSS: Focus areas and action items

In order to differentiate their offerings in a hypercompetitive marketplace, CSPs must undertake a digital transformation of their OSS, focusing on the following most important dimensions:

First, the next-gen OSS should implement a dynamic, closed-loop service orchestration encompassing an accurate representation of the network resources and their current configuration, coupled with a feed forward loop that drives service configuration updates and changes into the network. It

must also have a feedback loop that monitors network health, and provides dynamic service impact analysis, assuring the services transported by underlying resources, regardless of whether they are physical, logical, or virtual. The service orchestration of the closed loop should be overlaid with policy management and control to implement the requisite dynamic governance and security functions. A future overlay of artificial intelligence (AI) may also become possible soon, enabling robotics and automatic machine-driven operations and orchestration, although the latter technology is still in a nascent state.

Second, the reimagined OSS should be based on an open, flexible, and cloud-ready service oriented architecture, empowering a CSP to rapidly respond to evolving user needs. The use of microservices to implement functionalities that can be tailored and composed in an agile manner to match the required business and technical requirements will be an important feature of the next-gen OSS. This OSS should also enable dynamic interactions with customers, partners, and internal business users, across internal and external resources. Open APIs are a key feature to enable this critical capability.

Third, it is paramount for a CSP to adopt agile continuous delivery and DevOps methodologies for the development and deployment of next-gen OSS functions and services. Embracing such an Agile DevOps approach will help service providers proactively and promptly meet dynamic customer demands, and secure the first mover advantage in a fierce marketplace with rollout of innovative, relevant offerings.

Finally, with the proliferation of real-time, critical network and business information, CSPs must effectively leverage data analytics tools to monetize the same. The next-gen OSS can play a critical role in retrieving telemetry data and monetizing the customer and network information, in real time. For example, by relaying network consumption data to financial systems, CSPs could gain significant insights into the business performance of the network.

Conclusion

As software continues to alter the very fabric of telecom networks, OSS must also undergo a dramatic transformation. The next-gen OSS will center on the 'everything as a service' credo, forcing CSPs to craft dynamic, relevant customer experiences.

While the precise contours of these reimagined systems will only get refined in the coming future, CSPs will do well to take an evolutionary, rather than a revolutionary, approach. They should start by selecting a certain high-impact function or service, implementing the various underlying components, and assessing the resulting outcomes before scaling the initiative further.

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About The Authors

Mounir Merhi

Mounir Merhi heads the OSS segment within TCS' Communication, Media, and Technology business unit. With around 30 years of experience, he is responsible for planning and execution of OSS transformation strategies for TCS' clients across the globe. Prior to TCS, Mounir spent 15 years at a leading CSP where he led several functions in network engineering and IT.

His areas of expertise include software architecture and development, application integration, enterprise architecture, systems engineering, and deployment of OSS. Mounir holds a Master's of Science degree in Electrical Engineering from the University Toledo, Ohio.

Lakshmi Pingali

Lakshmi Pingali is a CMI Industry Advisory Consultant at Tata Consultancy Services where he executes OSS transformation strategies, builds architecture blueprints, creates application roadmaps, and adapts next generation industry standards to architect cutting edge OSS solutions at leading Communications Service Provider customers worldwide.

Lakshmi has over 19 years of diverse and comprehensive experience in the communications industry. He holds a Post Graduate Diploma in Information Technology and Management from AIMA – Centre for Management Education, New Delhi, India.

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