Shifting from Voice to Digital OSS

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Let me start with a story. When I first entered the OSS market 20 years ago, I joined a company called Granite, which was first acquired by Telcordia Technologies and later by Ericsson. At the time, it was one of the most advanced inventory systems available, competing with other inventory systems—small and large—such as Cramer Systems. To my surprise, the company's product is still used and is in production in many places today.

Twenty years ago, we could make OSS platform decisions with reasonable confidence that our choices would remain viable for many years. In the 1990s, for example, if we decided to build our OSS around a particular brand of relational database, we believed it could remain viable through 2010. The predominant question customers were asking us at that time was: how we do IP and, with some exceptions, MPLS? The good news was that we could always get away by having IP address management. I still recall the head of product management saying, "we are going to make look this "IP-ish." I still don't know what that means, but customers were extremely happy with the "innovations" of the time.

Fast forward 20 years into today´s world, and it seems like many things have changed but some things have not changed at all. We can probably categorize the underlying reasons, facts, and challenges into the following categories:

Pace of innovation

As an industry, we have been talking about cloud, network innovation and virtualization—such as the application of SDN/NFV—for quite some time. The early successes of the network virtualization concepts were combined with some of the frustrations telcos were experiencing. Ibrahim Gedeon, CTO of Telus touched on this point during Digital Transformation World last year by stating Telus had to hire more engineers to run its NFV farm. Some rumors confirm there are a few successful NFV deployment, such as at Telia Sonera. But most of the processes are still manual, and they are in a different place. Many SDN projects morphed into SD-WAN projects or are conversely rebranded as SDN altogether. Today, operators are looking at edge, multi-cloud and distributed processing and computing, struggling to keep pace with the speed of innovation as it is unfolding.

Customer experience as a part of digital transformation

One of the biggest challenges for any provider today is managing the customer experience. Millennials and Generation Z are exerting great influence in the workforce and commercial economy. As a result, the one-click, Apple-device experience is becoming a mandatory part of the workflow. More and more, applications must be designed and evaluated for ease of use. Gone are the days where network engineers were logging into the devices via shell—and manually changing the configuration of many. The customer expectation is, increasingly and unrelentingly, about doing it all in real time with the same ease and effort as it takes to buy a pair of shoes on Amazon.

Telecom transformation

Telecom companies have long been in the IT business, but recently there is a clear push to change to bring more agility into the telecom with existing IT tools. If done well, the added agility can be used to break transformation projects down into smaller, more manageable pieces. The art of transformation is in designing small autonomous teams and designating a breakdown of work to minimize dependencies. Agility, with the help of IT, will transform telcos into dynamic, digital enterprises, which is increasingly important to remain competitive.

Consider the following example. A typical DDOS attack can be discovered 70 percent of the time within three to five hours. But the cost of such an attack amounts to hundreds of thousands of dollars an hour. The cost is even higher for telecoms due to the mission-critical nature of the telecom business. The question is, are telecoms agile enough to respond and prevent DDOS attacks?

Some telcos such as ATT have acquired security companies such as AlienVault in order to prepare for these challenges. The newly defined technology or product category SIEM SOAR (Security Information and Event Management—Security Orchestration and Resolution) is currently outside of OSS scope and resides within IT as part of newly organized Security Operation Centers (SOCs).

Data volume

According to AT&T's Andre Fuetsch, data usage has been increased over 360,000 percent since the introduction of the iPhone 11 years ago. AT&T's data suggests that 242 petabytes of data are traversing its core network on a daily basis. If this figure is true, the traditional assurance tools based on SNMP-trap processing are no longer viable. Furthermore, the data forms within networks are changing as well. While 45 percent of C-level executives believe a small percentage of their data is unstructured, the reality is that 78 percent of organizations are dealing with unstructured data that accounts for more than 50 percent of all data, according to recent HFS research. With the amount of data telecoms have to process and the increasing expectations to use the data to serve customers better, the question is: how fast can that data can be processed?

The speed of operation at scale

Some telecom operators are still dealing with traditional voice services and applications. According to industry numbers, telecom revenues have been declining since 2010 as mobile revenues plateau and voice revenue erode. The worse news is this is probably not the end and the full impact of OTT—including such apps like Facebook, Google, Whatsapp and Skype—will push traditional telecom revenues down even further. Some telecom providers are scrambling to get into other horizontal markets such as entertainment, gaming, healthcare, and autonomous mobility, but these are essentially new industries.

The promise of the Internet of Things (IoT) brings hope. But the question is how can telecom providers efficiently master (and monetize) the new challenges related to the 50 billion devices projected to come online by 2020? Telcos are seen to be the natural fit to manage IoT segments and tap into the IoT opportunity. But with increased revenue pressure, it is not clear if they can, and they may ultimately hand it over to hyperscale companies that can do so. Telcos still need a relatively long time to introduce a new service and require droves of engineers to manage devices, whereas hyperscale giants—like Amazon and Google—have a "just do it" attitude with admittedly simpler infrastructure and an appetite for innovation.

Distributed networks and edge technologies

In the past, telecom networks, even the biggest ones, were stretched across multiple continents but with very clear submarine cabling and a lot of over-provisioned bandwidth. The latest numbers on

edge computing suggest there is a need for ten times the number of cell towers in US, and that equates to around two million new edge sites. Because of mission-critical applications and the respective jitter and delay, getting closer to the customer would be mean more equipment. But this also drives the need for hyperautomation and autonomous operational support systems.

Shifting from a monolithic approach to nimble micro services

The remarkable success of open source in many domains called for similar initiatives in the telecom domain. For example, the Linux Open Network Foundation is making great progress. There have been other industry initiatives to simplify or improve NFV, including LF Networking's announcement of its OPNFV Verification Program (OVP), which is the first iteration of a VNF compliance program that will grow to include NFVi.

To solve some if its orchestration and automation issues, AT&T developed ECOMP, which included 8 million lines of code, and later put most of ECOMP in the Linux Foundation to help create ONAP. In parallel, ETSI has developed its own Open Source MANO architecture and code. ETSI MANO was often called the light version of ECOMP, as there was not concept of assurance or closed loop assurance incorporated. All of which, according to Lean NFV, made NFV more complicated.

Service providers and vendors were caught up in almost-endless developmental cycles to make NFV work, but instead NFV made things even more complex. The ECOMP successor ONAP made a lot of waves with different versions—known as Amsterdam, Beijing, Casablanca—and, according to critics, none of them had a successful production story. With the introduction of Lean NFV, however, there is hope that newer technologies such as Kubernetes may be able to help streamline the processes.

The term AI (artificial intelligence) is being widely used by marketing, sales, CTOs, and CEOs deliberately to raise the bar for the next generation of intelligence. As an old machine-learning (ML) academic and veteran myself—and basing my perspective on many discussions with experts across our domain—I offer the conclusion that most so-called AI would be better classified as digital intelligence (DI). What is being called AI today constitutes mostly digital decision trees that can make decisions for us versus a fully independent intelligence that can decide which decisions it wants to make.

The fact is that ML and DI (but not AI) could make a lot of things better for us. But this isn't a mature product category. We still have to obtain training data sets to make use of it and teach our algorithm to run. Without the underlying data and training, not much can be done today. In many future challenges for the telecom industry—for instance, the distributed edge—a ML/DI distributed intelligence would be very handy. But again, there can be no machine learning without the underlying data sets, and ergo the approach isn’t viable as it currently stands. The data needs to be gathered and ML-trained, and new products must be rolled out for individual use cases. Customers and suppliers have to provide input based on joint venture and DevOps methodologies to master these challenges.

The transition of OSS from voice to digital will not happen overnight. We still need experts to provide us with standards and best practices to build comprehensive solutions. The TM Forum, with their eTOM, did a great job in the past to provide guidelines on how to categorize different products into different groups based on categories and a suggested architecture. Today we have many groups and institutions that are undoubtedly experts, making many different suggestions, depending on which groups they belong to. And opinions differ. For example, some ETSI MANO experts suggests to hold an information model at the orchestration layer and diminish the value of inventory systems—and potentially even create some inconsistencies with inventory.

The Future of Digital OSS

At Ziotis, we are looking forward to the future and building a highly scalable, data-driven OSS that can enable real-time hyperautomation by leveraging open APIs, and that can act autonomously by using DI and other automation technologies such as robotics process automation. This is what is needed now, and it represents the future of OSS.