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# AI, CX and the Road to Zero Touch

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Among many other things, the onset of the pandemic completely transformed when, where, and how people access communication service providers' (CSPs) networks. People who could work from home set up home offices in bedrooms and basements. When the schools closed, kindergartners and PhDs alike found themselves on laptops around the breakfast table working on their studies.

Office parks, middle schools, and colleges were emptied of their daytime inhabitants and their network service demands plummeted. When the home office became the only office and workers required daytime bandwidth in bedroom communities and apartment complexes, CSPs had to scramble to meet a new and shifted demand. This new shift in demand brought on an entirely new business model. Before, CSPs' service level agreements (SLAs) were focused on higher-paying business customers. From an operator's perspective, maintaining these SLAs was relatively simple, or at least predictable. CSPs had historical data on typical Monday through Friday office park usage. KPIs were well established and could be measured against SLAs.

The migration from the office park to the home office trampled those KPIs. In this new scenario, CSPs lacked historical data to measure usage patterns and no longer understood what was normal. People were using the network in new and novel ways. People who had previously surfed the web to buy products online were now using bandwidth-intensive applications like videoconferencing and streaming. The KPIs that had been effective for monitoring network traffic in suburban communities during the day had been upended. The quality of network service fell as CSPs struggled to keep up with the new demand.

## Paying the price for poor service

The suburban households expected their home network to be as seamless as their office experience. But many consumers probably didn't purchase enough bandwidth for the data-intensive videoconferencing and streaming services they were now employing indiscriminately during the day. The different expectations for bandwidth availability created a flood of calls to call centers, which led to increased resources being used by CSPs for truck rolls and in data centers. Furthermore, by the time a customer calls a CSP to complain, the CSP has an unhappy customer, and it's an unfortunate way to troubleshoot problems on the network. This inefficiency leads to lost revenues and a devaluation of brand identity.

Customer churn now became an issue. One of the major problems for CSPs was that their daytime metrics were based on limited home use and high office park use. CSPs had mostly been focused on how to serve their highest-paying customers—a reasonable business strategy in normal times. The pandemic, however, upended this model, and now CSPs needed to find a way to monitor home network usage patterns that were in flux.

One obvious fix is to build out network infrastructure, pull more fiber, build out the core, and upgrade where possible. While this is an effective solution to providing more capacity to fill customer demand, it doesn't improve monitoring or understanding of service levels.

Setting up new monitoring dashboards for customer experience would be an inefficient way to understand how customers are using the network and services. Humans simply are not capable of creating the dashboards required to monitor the health of the network as quickly as network usage is changing. Maintaining the network in the old way created operational inefficiencies, required a large headcount, and led to numerous truck rolls. The lack of end-to-end visibility in the network strangled revenues. From the onset of the pandemic through the lockdowns and now the reopening of the economy, CSPs haven’t known how to monitor network service levels. Now, as the economy reopens and we shift to a new reality, people are leaving their houses for restaurants and office towers. CSPs need a faster way to monitor their networks.

These current usage trends and the uncertainty of the next few years are pushing CSPs to investigate adding another layer on top of network monitoring. Many companies are using artificial intelligence (AI) for real-time service experience alerts that proactively monitor customers’ experiences. When deployed effectively, AI and machine learning (ML) collect and aggregate data generated by multiple network elements and domains, and autonomously analyze the data to detect significant events and correlate patterns related to service experience degradation and network availability.

Another big reason for the push to use artificial intelligence for service monitoring is that the mountain of data that networks are currently processing is going to get significantly larger. In the coming years, the continued rollout of 5G, a steady increase in the production of self-driving cars,

more video-based applications, and the proliferation of IoT devices will produce higher data streams that will tax CSP networks.

## How AI helps CSPs

Many CSPs struggle with alert fatigue, a flurry of false-positive alerts that drained resources. When used properly, AI can speed time to detection and remediation for network service issues by correlating events and reducing false-positive alerts. For AI-based service monitoring to create meaningful alerts, it must identify relationships between metrics and the events that impact how they behave.

For example, AI might connect site downtime to maintenance. Typically, this is difficult for CSPs because the information about each event is siloed, and responsibility belongs to different departments within the organization. Quickly finding and correlating cross-siloed anomalies before they impact the customer experience is a difficult task for most organizations.

Correlating anomalies to the events that influence them is a must for root cause analysis. Without a strong AI correlation engine, a flood of false alerts could spur a lot of unnecessary truck rolls and losses in revenue. One CSP using AI went from 54,000 alerts per day to around 30 alerts per day by moving to an AI-based solution, and they were able to shorten the time from alert to resolution by as much as 60 hours.

Correlating anomalies across silos can also reduce customer churn. As we emerge into a post-pandemic world, and business travelers and vacationers leave their home countries, roaming becomes an issue for networks. Subscribers across the globe rely on their phones and roaming services when they travel. Any degradation in phone service is difficult for subscribers because without the phone, it's hard for them to contact their CSP. AI can detect roaming issues before they lead to customer churn. For example, an anomalous drop in data volume from different inbound roamers (from multiple countries) might be due to a drop in the DNS success rate. Quick detection and resolution of the issue would minimize the impact on subscribers.

## The road to zero touch

Zero touch remains the Holy Grail for CSPs. The emergence of 5G and edge computing technologies will enable CSPs to offer more services, further enhancing the customer experience. But the rise of this digital transformation comes at a cost. Networks and network services are becoming more complex. CSPs cannot afford a misstep. Customers don't care about complexity; they care about services and lack of downtime. Machine learning will help CSPs move from simply reactively monitoring multifaceted networks to remediation.

Here's how this process will work. The first step is **anomaly detection,** which is already in place, as CSPs use business monitoring to measure service levels. **Correlation and root cause analysis** enable CSPs to use ML to correlate events in real time across billions of metrics. The advances in ML have enabled CSPs to correlate different events across multiple technologies and multiple vendors, speeding time to remediation for teams. **Autonomous remediation** is the final step to zero touch. Currently, the automated closed-loop process can be observed in low-level tasks such as automating “bounce the server” or “open a ticket” types of scripts. but humans still must be involved to engineer a fix for the issue.

Today, the technology road map is in place to combine all three phases in the process. Looking ahead, an ML-based system will perform the anomaly detection and root cause analysis, our current state and, based on previous events, suggest and then execute an action. This will be done without human interaction. Completing the closed-loop process, ML-based systems will fine-tune their remediation efforts based on previous zero-touch activities.

## Evolution, AI, and ML

The telecom industry has evolved—and further evolution is on the horizon. The industry will always be a leader in reliability and innovation. We moved from telegraph to telephones, landlines to smartphones, and dial-up pings to videoconferencing. We are moving to driverless cars, 5G, augmented reality, virtual reality, and digital simulation in manufacturing. To get there and provide a seamless experience for the customer, CSPs need to adopt AI technology for improved service monitoring.

Deployed as an intelligent brain on top of existing architectures, autonomous monitoring tools provide early visibility of network issues that could lead to service disruptions. When set up correctly, they can detect and remediate problems before they impact the customer experience.