

Drivers and Barriers to Achieving a Data-Driven Operations Team

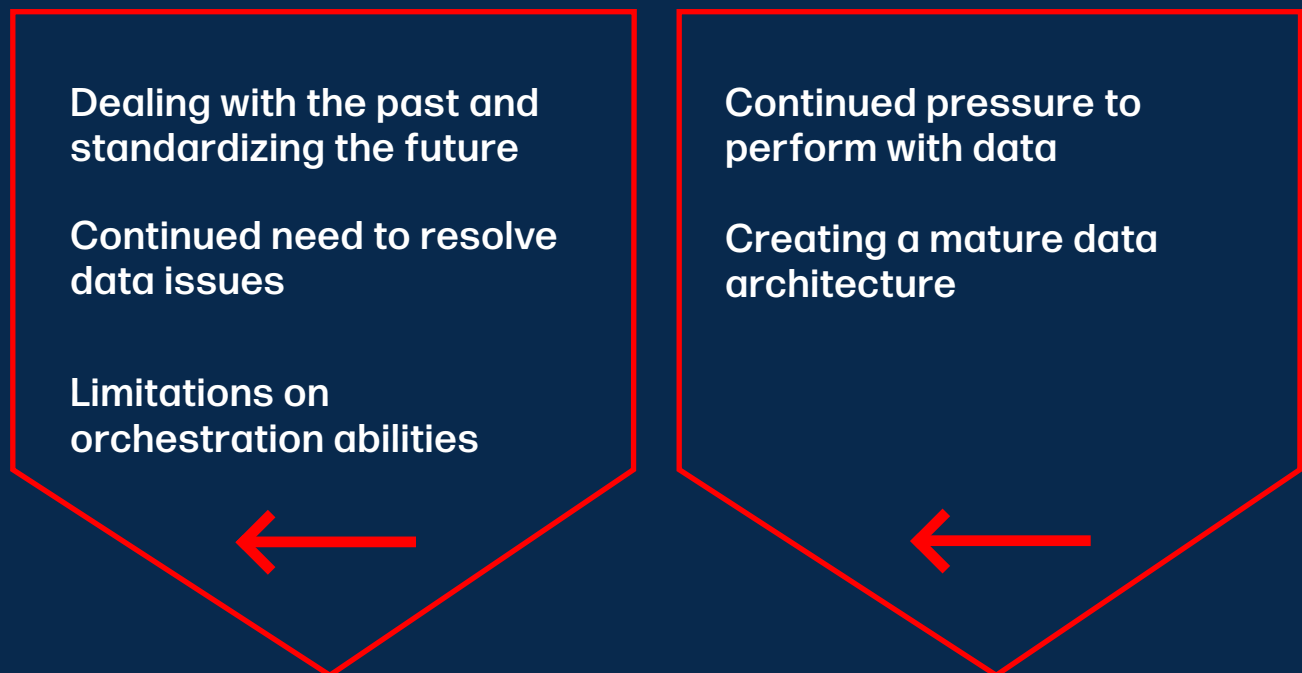
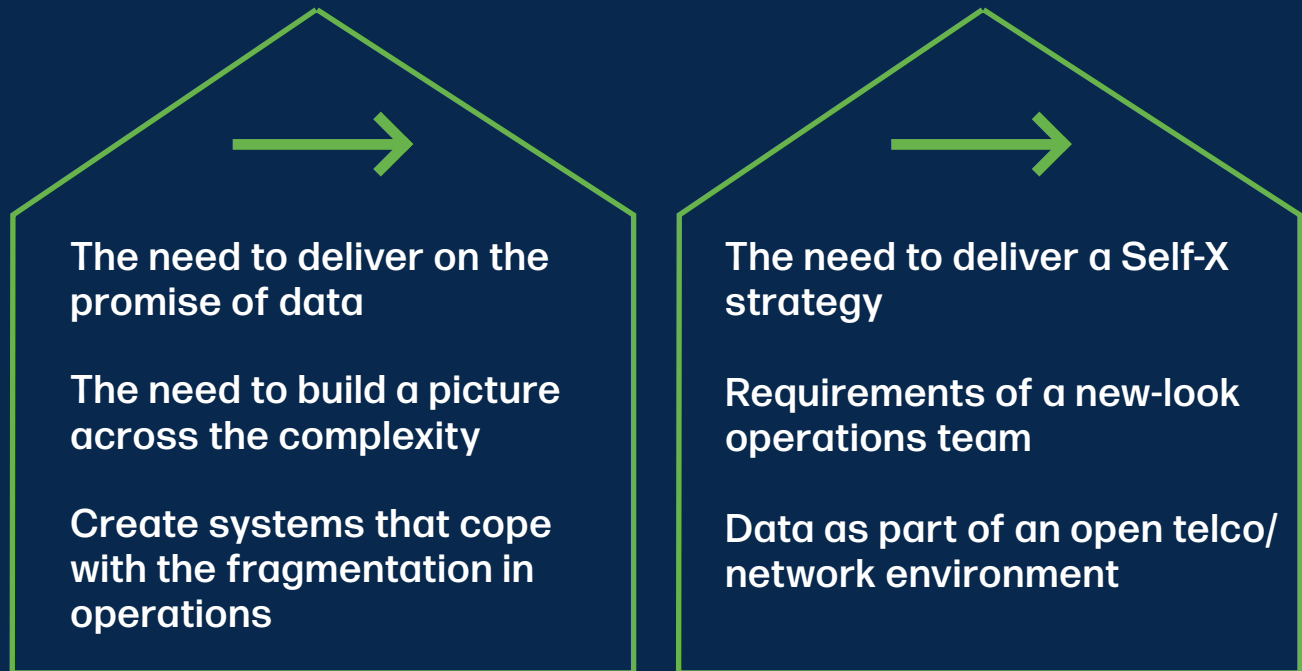


As telcos look to become more “data-driven” - particularly in the area of operations, where significant cost savings will be available - there are a variety of drivers and barriers which become visible.



DRIVERS AND BARRIERS TO ACHIEVING A DATA-DRIVEN OPERATIONS TEAM

The diagram below offers an overview of these in the short and longer term.



Discussion

Providing more detail on the points from the diagram:

SHORT TERM DRIVERS

There has been building expectation over the last 10 years about the ability of analytics, AI and automation to create both new revenue opportunities and cost savings - particularly in the network and operational areas of a telco. One of the major requirements to access this value is to be able to federate the massive data sets which sit within telco systems, understand this data and feed the resulting insights into operational systems and processes. As telcos move from traditional network builds towards virtualized, hybrid networks there is an increasing fragmentation of data and new systems are being put in place to create a “single pain of glass” across the network, from the device all the way into the cloud.

SHORT TERM BARRIERS

These new networks and desire from the telco to offer an increased range of products and service has - as is always the case - increased the technical debt. Looking at this issue in relation to the telco's data, there is an increase in volume AND variety AND velocity. New collection and storage systems using techniques such as data mesh and fabric are in progress - as are efforts to standardize what is available to allow it to be used effectively. A simple example in a network assurance system might be the need to standardize three sources from different parts of the network: source A refers to an entity by IP address (10.12.33.66), source B by FQDN (host123@network.operator.com) and source C by short name (host123). Cross-correlation is necessary before any

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of the sources can be used together to solve assurance issues. Once this cross-correlation is done and a data feed is available, another significant short-term barrier towards network automations can be the lack of orchestration at both a domain level and across the network - this will be slowly resolved over the next few years as telcos fully deploy their 5G networks.

“New systems are being put in place to create a ‘single pane of glass’ across the network, from the device all the way into the cloud”

LONGER TERM DRIVERS

TM Forum is working to define autonomous networks¹, the term “Self-X” is used to describe the various final states of automation in the network, such as self-driving, self-organizing and self-healing. The push towards these goals will dominate network activity in the next 5 years. This will generate significant changes within the operations team - a good number of headcount have already disappeared and new job titles been created. This will continue and team members will increasingly require new IT focused skill sets over more traditional network knowledge. There will also be a move towards data usage from the network by other parties in the ecosystem (customers, partners, 3rd parties) which will require a variety of new capabilities, platforms and APIs.

LONGER TERM BARRIERS

Given the investment levels needed to realize this “Self-X” environment and continued increase in traffic on the network, there will be no let up in the push by senior management to realize the promised cost savings. The creation of a

mature data architecture which instantiates the standardization of data and other good practices in security and governance will require significant time and energy from the telco to deliver.

“As the “Self-X” vision is bought to life, there will be a gradual shift from tasks that humans do towards tasks that machines do.”

THE NEED FOR OPERATIONAL TEAMS TO WORK TOGETHER WITH MACHINES

Looking at this increasingly complex network environment and at how analytics, AI and automation can help operational teams; one of the key requirements will be to have solutions which simplify the complexity of hybrid networks by performing simple automations where there are simple problems to be resolved and supporting humans in resolving more complex problems. As the “Self-X” vision is bought to life, there will be a gradual shift from tasks that humans do towards tasks that machines do; and machines will need to support this transition by providing “decision intelligence” (DI).

Decision intelligence will be particularly important as the staff in the operations centers will increasingly look unlike the current network specialists we find in the NOC/SOC today. The introduction of virtualized networks require IT-focused skills – meaning that, over time, network-focused headcount will begin to retire from the workforce; leaving a younger generation that will require support machines in understanding and working with insight from the network.

THE RISE OF DECISION INTELLIGENCE

As decisions in the telco become more complex over time, there will be more data sources and more complex modeling needed. DI is a trending field that contains a range of decision-making methods to design, model, align, execute, and track decision models. It requires skills from the data science team, operational research techniques from management scientists, business rules processing techniques, IT architecture, integration capabilities and knowledge from subject matter experts; as well as support from business transformation teams.

This multi-disciplinary collaboration will work on the types of decisions where complex capabilities will be needed - including those where:

- *multiple logical/mathematical techniques are used*
- *where the models created need to be modified frequently to take into account the changing environment*
- *where decisions need to be documented and auditable*
- *DI also includes thinking around the inclusion of human reasoning to parse the more subjective elements of the situation*

Within a telco, the areas where DI may be needed include decision making around network events, fraud and risk management, credit risk or compliance analytics, smart pricing, and next-best-offer. It will also enable citizen data scientists to author, manage and modify rules and other decision logic and to apply AI to create adaptive, predictive decision rules to optimize and automate human decision processes without the direct involvement of professional programmers.

VIA AIOPS AS STARTING POINT FOR DECISION INTELLIGENCE

The use of AIOps in the telco operations team is on the rise today – pushed forward by the factors already listed above; particularly the need to develop a single pane of glass across hybrid networks. It provides the starting point of a move towards implementing more complex DI tools.

Setting out a typical methodology for staff in the NOC to deal with transient network issues: common practice today is to let an issue “soak.” If it persists, then further investigation is required. Because of this two-step process (soak, investigate), and because common tool deployments are not stateful, manual intervention is required for monitoring, triage and ticket creation.

Typical steps might be:

- > Legacy tool polls a router for interface status
- > Interface reports as “down” and an alarm is displayed in tool’s UI with a polling count of 1 (NOC observes, takes no action)

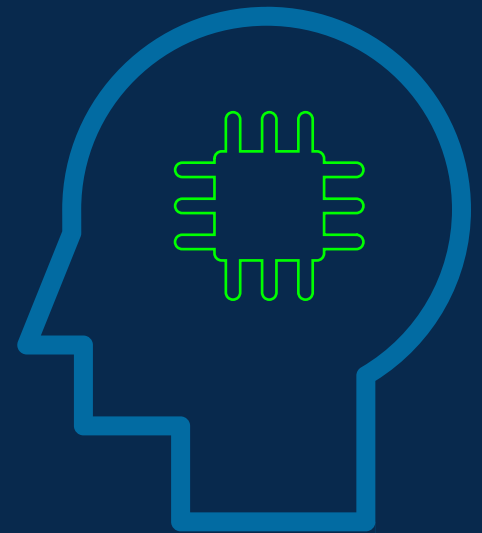
Five minutes later...

- > The tool polls again and same interface reports as “down”, alarm count increments to 2 (NOC observes, takes no action)

Five minutes later...

- > The tool polls again and same interface reports as “down”, alarm count increments to 3 (NOC observes, actions the alarm)
 - > NOC logs into device directly and captures live interface statistics
 - > From the stats, determines whether interface is consistently down or “flapping” (frequent transitions from down to up state)
 - > Interface stats are captured (text copy or screenshot) and sent to tier II analyst for review
- > Tier II analysts opens a ticket in an incident management system to remediate issue

A new AIOps tool, VIA AIOps from Vitria, enables a machine/human collaboration when a network issue occurs:



- *The tool ingests SNMP traps and syslog data (faults) related to interface status*
- *Fault reports interface as “down” and VIA AIOps creates a Stateful Signal, which starts an internal state machine*
- *If a fault is received reporting interface as back “up,” then the state machine closes, the signal closes and the NOC never needs to see an alarm*
- *If no “up” is received OR if VIA AIOps receives multiple down/up state transitions (flapping), then Signal is escalated to an Incident*
- *The VIA AIOps Incident initiates automated actions of*
 - > **opening a ticket in an incident management system**
 - > **capturing latest interface stats**
 - > **automating restoration of the link (e.g., restore adminStatus to “up”)**
 - > **monitoring the link to ensure it remains up**
 - > **closing the ticket in the incident management system**

OUTCOME:

With VIA AIOps, ALL of the current manual actions (observe an alarm board, wait for counts to increment, capture stats, create ticket, close ticket) are automated. False positives are eliminated. Zero alarms are missed and NOC staff can focus on prevention and remediation; not monitoring.

HOW SHOULD TELCOS PROGRESS TOWARDS THIS DI ENVIRONMENT?

Understanding that the operations team will be increasingly bombarded with problems from the complexity of the hybrid network and new RAN configurations. Decision makers should:

1. Look at the current pain points of the operations team in the new hybrid network and consider future pain points that are likely to appear in the short to mid-term
2. Highlight those that have a data-related resolution, as possible candidates for introduction of a DI solution
3. Sketch out the end-to-end process that would best resolve the pain point and understand where a human is required to make decisions; selecting those which happen most often
4. Look at market solutions which would resolve the pain point - how automated are they really? Where are humans needed? Would they be a significant improvement from the existing solution?
5. Create business case modeling to determine if a new automated solution would save enough time to impact the bottom line; given that some automations may require significant work to implement
6. Ensure that planning for introduction of the solution includes data management, governance and security. Also, given the rise in interest around new data being collected from the network, consider where the data collected might be useful in other parts of the organization.

Start the Journey towards Supporting the Operations Staff of the Future.



The deployment of modern AIOps tools is one of the first steps towards supporting this new NOC/SOC team. AIOps provides automated analysis and remediation when potential service-impacting events are seen and ensures that team are only presented with the most important issues.

ABOUT VIA AIOPS

VIA AIOps delivers the process automation capabilities needed to transform operations and markedly lower cost. VIA's real-time analytics, artificial intelligence and machine learning provides the intelligent automation required to achieve a new service assurance operating model and a new way of working. This new operational model significantly reduces cost, enables a superior customer experience, and provides augmented intelligence to support a leaner, more efficient and effective operational staff.