

PREDICTIVE ANALYTICS

How to train your network analytics systems – the growing importance of predictive analytics for network service assurance and maintenance

Communications Service Providers (CSPs) are constantly faced with the twin challenges of controlling costs and the need to make constant adjustments to their networks through the introduction of new services, upgrades to existing elements and boosts to capacity and coverage. This creates tension - a volatile environment, in which problems with network and service assurance can result. These can have a dramatic impact on customer experience and costs, causing them to escalate rapidly.

“PREDICTING HOW AND WHERE YOUR NETWORK MAY EXPERIENCE PROBLEMS IS THE NEXT PHASE IN THE EVOLUTION OF SERVICE ASSURANCE AND PERFORMANCE MANAGEMENT”.

Robert Eriksson
Director, Customer Experience Management, Polystar

Of course, CSPs usually have systems in place to identify and analyse problems, but it's becoming increasingly clear that solving problems when they have already occurred – and after time has passed - is a significant contributor to their cost base. For example, a change in configuration made to a network node, such as an eNodeB, may cause an increased load on another node. The impact of this may not be observed until hours later, when the increased load leads to service degradations for users. So, if we could predict that a problem may happen and point to where it will occur, it would make it possible for a CSP to dramatically reduce the network maintenance cost. It would also have a positive effect on customer experience by enabling the correction of problems before they become apparent to subscribers. Predictive analytics is seen by many as a solution to this problem and it is believed that it can deliver both direct and indirect benefits.

SECURING THE BENEFITS OF PREDICTIVE ANALYTICS

Direct benefits include those that are easily quantifiable, such as reducing the cost of finding a solution, compensation payments to customers, and the minimisation or avoidance of possible penalties that might result if an SLA is breached. Indirect benefits can include the avoidance of negative publicity that may result from network performance issues, and the possibility of increased churn as a consequence of impaired customer experiences. While predictive analytics could be used for a wide variety of use cases, CSPs are now increasingly interested in the specific topic of **Predictive Network Maintenance**, as a means to enable them to secure the expected benefits.

However, the predictions that CSPs need to make to be able to avoid the occurrence of network and service issues cannot simply be plucked out of thin air. They need to be drawn from a sufficient source of reliable data. Happily, CSPs have data in abundance and are exploring how it can be used together with machine learning to predict the emergence of problems. This will allow new trends and indicators to be observed, that are hard to spot even for the best engineers.

SOURCE OF DATA FOR PREDICTIVE NETWORK MAINTENANCE

For **Predictive Network Maintenance**, and other use cases, to have the desired positive impact, the data provided must be relevant: clearly, CSPs need the right information to make accurate predictions and to secure the expected benefits. In this context, there are three key sources of data, which are best collected by passive probes that sit non-intrusively between network nodes and are completely vendor agnostic, or which is obtained from OSS trace files:

- Network data
- Customer data
- OSS device data

Network data consists of information that is generated by nodes and entities in the network in the form of events. Each node must communicate with others to process services and maintain connectivity and with the constant need to maintain network performance, there is a vast flow of such information, covering requests and responses that ensure the operation of the network. In addition, such nodes all generate trace files and reports, known as Network OSS data. Collectively, this provides a rich resource of data regarding network status, operational performance, updates, and much more. The information contained in this data can reveal irregular patterns, provide alerts regarding instability or failures, or indicate trends that can point to future or emerging issues.

Customer data is generated when users consume or access services. Such users may be people or IoT devices, but whenever a service is requested, a series of communications messages are generated.

“Polystar’s efforts are pioneering the development of Predictive Network Maintenance and will enable CSPs to process and make relevant the critical data that flows through their networks”.

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These messages provide a wealth of data regarding service performance which, in turn, reveals how services are being delivered and how they are performing. This yields information on issues that may be known or unknown and customers may as yet be unaware of such issues, so the data can give early alerts of issues that are emerging and which may impair the customer experience.

Device data spans both unseen communication from devices and information about individual devices. As such, this data reveals valuable information about the device fleet, handsets or otherwise, which means it's possible to understand how different devices perform with the available services.

THE ART OF DATA CONVERSION

To be useful, this rich supply of information must be collected and then converted into a form that can be processed by analytic engines to extract the intelligence it offers. Network, customer and device data can be collected from a number of sources. Passive probes, which gather information that flows across networks from monitoring points are one source, while logs that are created by operational systems are another.

Once collected, the data needs to be pre-processed because of the underlying volume and complexity of the different sources of data and the need to provide consistent input to processing systems. To make it manageable, this data volume needs to be reduced and the data cleaned, a process technically known as “dimensionality reduction”.

This can be achieved by removing all data that has little or no predictive value – that is, data that can be removed without affecting the resulting predictions. As can be imagined, this is often the most difficult step and requires expertise in data science, so that systems can be taught what data is relevant and to explore it in different dimensions. Once cleaned and reduced, the collected data can then be analysed in real-time, so that state-of-the-art machine-learning algorithms can be used to predict future network problems.

UNLOCKING INSIGHTS FOR ALL

Once this has been accomplished, it's important to consider how the data is presented to CSP agents so that they can act on the processed information and the insights it offers. They will need to be notified of potential future network problems in a clear and easy to understand way. Polystar already provides portals that present information such that only relevant data is presented and grouped in a way that allows actions to be taken. Each portal is optimised for the needs of specific user groups, which means that the right information is immediately available. The complete data also remains available for analysing the problem and correcting the root cause. The net effect is to accelerate decision making, by placing critical reporting and trend indicators directly into the hands of the team.

POLYSTAR: PIONEERING PREDICTIVE NETWORK MAINTENANCE

Polystar is also at the forefront of initiatives to add **Predictive Network Maintenance** capabilities to its solutions, so that the portals can be augmented with predictive engines. These will perform analytics directly within the portal framework so that, for example, in the case of network operations, data that can be used to predict network issues is accessible from a simple interface and dashboard.

Not only will this lead to direct cost savings through the reduction of service impacting issues, it will also reduce indirect costs, such as those associated with the allocation of resources to tasks, because it enables all engineers to be proactive while ensuring that the most qualified can focus on the most difficult cases.

It's an evolving field of study, particularly within the telecom domain. Polystar's experts are striving to understand what's important, so that they can enable CSPs to correct potential problems before they occur, particularly as the network evolves and grows. It's in its infancy, but with an increasing number of devices likely to be connected to an increasingly diverse network infrastructure, it's clear that predictive analytics will play an increasingly important role in network management. It will become a mandatory requirement and realising its promise will be key to cost control and the delivery of better experiences to customers and service users. Find out more with Polystar.

Robert is passionate about creating value for customers, by finding ways to connect technology and business. He has long experience working for telecom operators as R&D manager, product manager and senior business strategist. Currently Robert is Director, Customer Experience Management at Polystar.



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Polystar is a leading provider of real-time monitoring and analytics platforms to more than 100 CSPs worldwide. The company's solutions deliver tailored insights into network, service and OTT application performance. These insights allow stakeholders to enhance customer experience, operational efficiency, and identify new revenue streams from data monetisation.

Polystar's products enable the smooth introduction of new technologies and services, including 5G, NFV and IoT, helping CSPs build and operate cost efficient, secure and reliable networks.

Powered by Elisa Automate, Polystar also ensures proactive management of networks through automation of operational processes, driven by machine learning. CSPs benefit from faster fault resolution and more efficient use of both operational and network resources.

Polystar was founded in Stockholm in 1983. The company has experienced continuous growth and has evolved to become a global company, serving customers and partners in over 50 countries. Since June 2019, Polystar has been part of Elisa. For more information, please visit www.polystar.com

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