TTI Telecom

Your Network Management Partner

Solving Operational Efficiency Blindness in Service Quality Monitoring

White Paper

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Introduction

Facing the complexity of establishing market differentiation, communication service providers (CSPs) strive to maintain customers' trust through their service offering. While recognizing that maintaining high service quality levels plays an important role in this battle, CSPs focus on the quality of service applications, such as voice and video, and tend to show operational efficiency blindness to network disruption or failure indicators that are inseparable parts of Quality of Service assessments. This paper describes the importance of these indicators in Service Quality Monitoring, their effect on customers' perception of their service provider and particular service. This paper also proposes methods for incorporating operational efficiency indicators within an overall Service Quality Monitoring solution.

What's The Connection between Customer Satisfaction and Operational Efficiency?

In order to maintain high customer satisfaction, operators need to constantly evaluate the performance of their service offering. In Next Generation Networks, where services *are* applications, service performance is a result of both direct and indirect operational aspects of the product. The direct aspects refer to how well the application performs technically and whether or not it suffers from quality degradations noticeable by customers, such as voice choppiness or video pixeling. Indirect aspects refer to how the product is delivered satisfactorily to the customer, the level of service disruption, and how efficiently these disruptions are handled. These indirect aspects are often hard to detect and hard to measure, causing operational efficiency blindness.

In addition, customers are usually not familiar with the technical terminology (jitter, delay, jerkiness, echo) used by operators to describe technical quality levels. Therefore, despite the fact that CSPs place great effort in providing the highest quality levels of their applications, customers can remain unsatisfied with the service.

Today, customers are less inclined to make decisions based on direct aspects of a product. As services become more stable and mature, customers accept current quality levels of application and are less tolerant of other indirect factors that have greater influence on overall customer satisfaction. This observation is also evident in a survey conducted by UK office of communications as shown in figure 1. This illustrates how customers in the UK perceive the performance of their CSP services which shows high satisfaction rates in the direct areas of reliability of connection, features and functionality. In contrast, customers surveyed were less satisfied with the performance of their technical support despite having defined this indirect attribute as an important one.

In order for CSPs to differentiate themselves from their competitors they need to put more emphasis on the indirect factors that affect customers. This can be achieved by increasing their awareness of and ability to quantify operational efficiency.

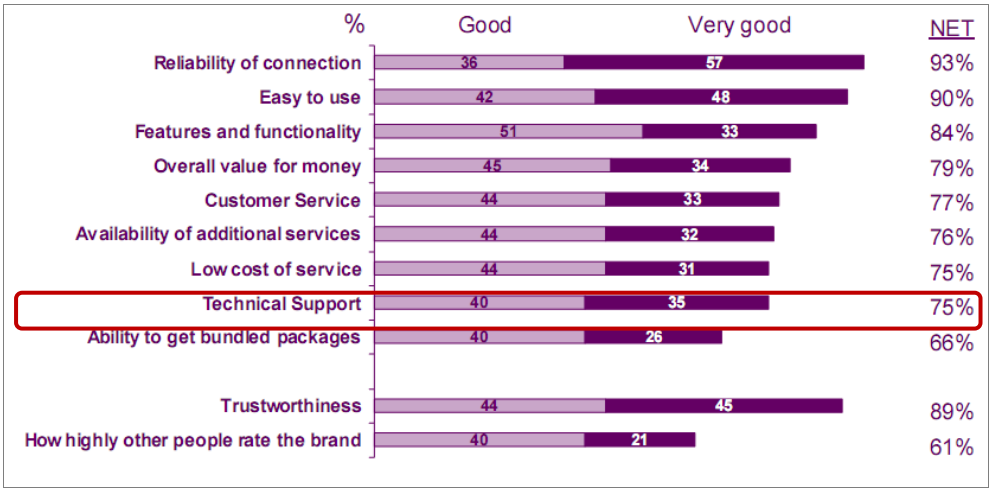

Figure 1: Perceived performance of wireline operators in UK

OFCOM survey, OFCOM Report, Consumer Experience Research Annex 4, Consumer Decision-Making in the Telecoms Market, November 2006

Curing Operational Efficiency Blindness

A best practice for organizations to excel in operational activity starts with the implementation of structured operational procedures. These procedures comprise methodologies for collecting network and service events, filtering and applying the necessary correlation rules and storing the relevant data for further evaluation and tracking. This data can be used later as the basis for operational performance analysis.

Operations managers are constantly evaluating department procedures and seeking ways to increase their efficiency. For example, they are interested in assessing the time it takes for the Network Operations Center (NOC) to resolve a service disruption or outage. Metrics like MTTR (Mean Time to Repair) and Failure Rates are commonly used in these assessments. One method often used for calculating these metrics is to compare the interval between opening and closing a trouble-ticket. The problem with this approach lies in its accuracy and trustworthiness – trouble ticket time records usually do not reflect the actual disruption occurrence and is subject to human errors. Consequently, the reliability of the data calculated is low.

How can CSPs make sure that these calculations are accurate? By relying on existing fault monitoring systems for raising and clearing alarms, an operational performance solution provides the following advantages – it achieves high accuracy and reliability levels in the automatic metric calculation; it reduces unnecessary human intervention in operational evaluation procedures.

Enforcing Service Level Agreements with partners is another important aspect of operational performance. In today's network deployments, where equipment vendors take responsibility over their networks, services, and integrations, almost every project requires a maintenance contract. This contract commits the vendor to maintain certain availability levels, including a credit structure. In reality, the fact that many devices do not provide a feasible mechanism of availability reporting, leads to inaccurate, manual calculations that often cause the vendor to ignore the commitment entirely. Continuous and systematic operational performance monitoring can bridge this gap and can demonstrate effective use of service components. Calculating metrics such as availability, failure rate and Mean Time between Failures (MTBF) provides an accurate and reliable source for Service Level Agreement reconciliation. These metrics help optimize cost savings, reduce human work-hours, and increase operational efficiency.

As NOCs can now measure indirect factors such as service disruption levels, they are better equipped to understand and evaluate the customer experience. CSPs can leverage this capability to improve collaboration among centers for Network Operations, Service Operations, and Customer Support. This collaboration is particularly important when CSPs target service level objectives that are closely related and usually derived from indirect aspects.

Following is an example of a DSL operator's Service Level Agreement:

Performance Metric	Objective
Core Network Availability	99.9%
End-to-End Network Availability	99.9%
Mean Time to Respond	15 minutes
Mean Time to Repair	12 hours

Aside from 'Mean Time to Respond', all the performance metrics in this service level agreement are components of service disruption and outage analysis calculated by an operational performance solution. These performance metrics can be used to develop customer-facing procedures, set organizational benchmarking frameworks and monitor trends in customer experience.

Measuring Operational Performance Metrics

The performance metrics provided in this solution reflect how customers experience the level of service on its operational level. They address service performance from two perspectives:

- Level of disruption - the reliability and availability of a service, network-domain or device.
- Level of operational response – the effectiveness of operational procedures to resolve the disruption. It quantifies the quality of operations activities as well as measures personnel efficiency within the NOC.

Level of disruption

Indicator	Value	Benefit
Network Availability	The likelihood of a disruption of service within a specific period of time. Defined as MTBF divided by the sum of MTBF and MTTR	Reflects the operators' expectations for service interruption and serves as a key SLA metric
MTBF (Mean Time Between Failures)	The average expected interval between failures of a service or a service resource in steady state	Helps identify service failure reasons and assess network components' contribution to service disruption
Failure Rate	The inverse of MTBF or 1/MTBF	Indicates service disruption level over time

Level of operational response

Indicator	Value	Benefit
MTTR (Mean Time to Repair)	The average time it takes to carry out operational procedures and restore full service functionality	Measure operational efficiency and provide information for SLA enforcement and reporting
Repair rate	The inverse of MTTR or 1/MTTR	Indicates operational effectiveness level over time
TTA (Time To Acknowledge)	The duration from the time an alarm appeared in the system to the time it was first acknowledged	Determine NOC responsiveness in each phase of failure-handling procedures
TTC (Time To Clear)	The duration from the time an alarm was received to the time it was cleared (manually or automatically)	
TTD (Time To Defer)	The duration from the time an alarm was received to the time it was deferred	
TTOT (Time To Open Trouble-Ticket)	The duration from the time an alarm was received to the time it was reported in the trouble-ticketing system	
Recurring Failure	The list of alarms that have occurred several times within a defined period	Determine the quality level of repair and compare the level of effort invented in solving new failures vs. recurring failures

Business-Driven, Operational Performance Solution

TTI Telecom's operational performance solution is hosted on top of the fault management system while simultaneously using performance management capabilities in order to calculate operational indicators. The solution consists of the following TTI Telecom Netrac products:

- FaM Analyzer – core statistical engine of the solution, responsible for metric creation and calculation.
- This includes a set of pre-defined reports that provide an easy entry point for CSPs using this solution.
- FaM Reporter – presentation tool for generating and visualizing pre-defined and ad-hoc reports.

In order for the operator to benefit from business-driven performance monitoring and meet unique organizational requirements, the solution can provide wide calculation capabilities on top of the common performance indicators described in this document. Most CSPs are concerned with two major monitoring dimensions – vertical service structure and time aggregation.

Solution Benefits

- Better quantify the effectiveness of operational procedures and operation centers
- Provide performance indicators which measure the level of disruption to operations.
- Offer quantifiable metrics for organization benchmarking and market comparison.
- Provide useful indicators for establishing Service Level Agreements.
- Maximize the value of an existing performance management software with the expansion to monitoring business-driven metrics

The vertical service structure dimension refers to the system's ability to not only calculate generic performance indicators, but also to keep them aligned with the organization's specific business requirements such as per-domain, per-hardware vendor or per-customer calculation. This flexibility is mandatory for operators seeking a solution targeted to different departments within the organization. For example, the marketing department needs to review operational performance from the perspective of customer-group or service-type, whereas the customer support department needs to know if service level objectives match individual customer needs.

Time aggregation is an additional calculation dimension which operators find beneficial. TTI Telecom's aggregation techniques give on-demand access to operational performance data, recent or historical, depending on the query of the user. For instance, the solution can provide the operations manager with daily or weekly reports; the customer service with monthly reports; and senior management with annual reports, all of which require different time aggregation calculations. When the dimension of time aggregation is combined with the dimension of vertical service structure, the operational performance reports precisely fit customer requirements, providing the ideal tool for operational performance evaluation.

Conclusion

TTI Telecom's business-driven, operational performance solution establishes the NOC as a fundamental part in an operator's customer-centric strategy. This solution steers the NOC away from its traditional network monitoring and fault notification activities. With TTI Telecom's operational performance solution, NOCs can now help CSPs deliver high quality services and increase their ability to measure and evaluate the indirect factors affecting their customers. Consequently, these capabilities enable CSPs to increase customer satisfaction of services and strengthen their acceptance and loyalty.

About TTI Telecom

TTI Team Telecom International Ltd. ("TTI Telecom") (Nasdaq: TTIL) is a leading provider of next generation Operations Support Systems (OSS) to communications service providers worldwide. The Company's Netrac portfolio delivers an automated, proactive and customer-centric approach to service assurance and network management.

Anchored by market-leading service assurance solutions – Fault Management (FaM) and Performance Management (PMM) – that give customers an end-to-end view of their network, TTI Telecom's Netrac enables service providers to reduce operating costs, enhance profitability and launch new, revenue-generating services more rapidly. Netrac is compatible with multiple technologies and industry standards, and is uniquely positioned to bridge legacy, next-generation, convergent, and IMS Networks. TTI Telecom's customer base consists of tier-one and tier-two service providers globally, including large incumbents in the Americas, Europe and Asia-Pacific.

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