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The Total Economic Impact™ Of NetQoS Performance Center

Single Company Analysis

Project Director: Michelle Bishop

FORRESTER®

Headquarters

Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA

Tel: +1 617.613.6000 • Fax: +1 617.613.5000 • www.forrester.com

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Executive Summary

In January 2009, NetQoS commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying the NetQoS Performance Center. The NetQoS Performance Center is a suite of network monitoring and management products integrated through a Web-based console that provides a top-down view of performance metrics for application delivery. This study illustrates the financial impact of implementing the NetQoS Performance Center within a global engineering and electronics conglomerate. The conglomerate's North American team had a specific mission and interests in mind when it was introduced to the NetQoS Performance Center, which was initially implemented to accurately assess bandwidth use across its network in the Americas region. The organization needed to allocate WAN costs across various collocated business units as part of a real estate and data center consolidation initiative in the US, Canada, Mexico, and Latin America.

The organization's implementation team evaluated a dozen providers' solutions, narrowed it down to three contenders that installed their products on the production network during a three-month pilot period that included live product demonstrations, intense reviews of the features and capabilities of the tools, the prepackaged reports and deliverables, open architecture, resources, expertise and road map, and track record of the provider. A scorecard was used by the 11 members of the evaluation team to rank the products in 15 categories. Ultimately, the team unanimously chose to implement the NetQoS Performance Center. Because of the success of the project in the Americas, the organization has embarked on a global implementation of NetQoS Performance Center. However, note that the costs and benefits of this global expansion will not be included in this analysis.

In conducting an in-depth interview with this NetQoS Performance Center customer, Forrester found that the organization achieved productivity savings from improved efficiency during problem resolution, infrastructure savings by deferring an unnecessary bandwidth upgrade, and planned expense reduction by finding an alternative management solution to probe-based technology that was being pursued by a different part of the organization.

Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the NetQoS Performance Center on their organizations. Forrester's aim is to clearly show all calculations and assumptions used in the analysis. Readers should use this study to better understand and communicate a business case for investing in NetQoS and its Performance Center suite of products.

Methodology

NetQoS selected Forrester for this project because of its industry expertise in IT infrastructure and operations and Forrester's Total Economic Impact™ (TEI) methodology. TEI not only measures costs and cost reduction (areas that are typically accounted for within IT) but also weighs the enabling value of a technology in increasing the effectiveness of overall business processes.

For this study, Forrester employed four fundamental elements of TEI in modeling Performance Center:

1. Costs and cost reduction.

2. Benefits to the entire organization.

3. Flexibility.

4. Risk.

Given the increasing sophistication that enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves an extremely useful purpose by providing a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

Approach

Forrester used a four-step approach for this study:

1. Forrester gathered data from existing Forrester research relative to the NetQoS Performance Center and the IT infrastructure and operations market in general.

2. Forrester interviewed NetQoS marketing, product management, and sales personnel to fully understand the potential (or intended) value proposition of the NetQoS Performance Center product suite.

3. Forrester conducted a series of in-depth interviews with an organization currently using the NetQoS Performance Center solutions.

4. Forrester constructed a financial model representative of the interviews. This model can be found in the TEI Framework section below.

Key Findings

Forrester's study yielded the following key findings:

- **ROI.** Based on the interviews with the organization, Forrester constructed a TEI framework for the organization, and the associated ROI analysis illustrating the financial impact areas. As seen in Table 1, the ROI for our composite company is 266%, with a breakeven point (payback period) of 2.9 months after deployment.

- **Benefits.** The main quantified benefits for the organization were: 1) productivity savings due to improved access to accurate network data, resulting in increased efficiency in network monitoring and problem resolution; 2) the avoidance of bandwidth upgrade costs due to improved network management using the NetQoS Performance Center; and 3) cost avoidance of implementing an alternative probe-based management solution.

- **Costs.** The costs of the NetQoS Performance Center include: 1) product licenses and corresponding maintenance fees; 2) implementation and training costs; and 3) annual administrative human resource costs.

Table 1 illustrates the risk-adjusted cash flow for the organization, based on data and characteristics obtained during the interview process. Forrester risk-adjusts these values to take into account the potential uncertainty that exists in estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimation, incorporating any potential risk factors that may later affect the original cost and benefit estimates. For a more in-depth explanation of risk and risk adjustments used in this study, please see the "Risk" section.

Table 1: ROI, Risk-Adjusted

Ref.	Project cash flow	Initial cost	Year 1	Year 2	Year 3	Total	PV/NPV
J1	Total costs	$174,096	$42,506	$103,526	$32,741	$352,870	$322,896
K1	Total benefits	$0	$763,308	$310,020	$310,020	$1,383,348	$1,183,054
L1	Net savings	($174,096)	$720,802	$206,494	$277,279	$1,030,478	$860,158
M1	ROI						266%
P3	Payback period						2.9 months

Source: Forrester Research, Inc.

Note that calculation totals throughout the study may not align because of rounding. Specifically, calculations use the value of 60.09615385 for the hourly rate per worker but this factor is listed as its rounded value of $60.10 in the document.

Key factors that ultimately determined the final ROI included the number of network engineer hours saved through improved efficiency in network monitoring and incident resolution, and the number of devices/assets that require monitoring.

Please note that this ROI only reflects what the organization Forrester interviewed realized through the use of NetQoS Performance Center. ROI may vary by organization.

Disclosures

The reader should be aware of the following:

- The study is commissioned by NetQoS and delivered by the Forrester Consulting group.
- NetQoS reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- The customer contacts for the interviews were provided by NetQoS.
- Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in the NetQoS Performance Center.
- This study is not meant to be used as a competitive product analysis.

NetQoS Performance Center: Overview

According to NetQoS, the NetQoS Performance Center unlocks the intelligence needed to quantify network and application performance across an entire organization with end-to-end application response time monitoring, long-term packet capture and analysis, network traffic analysis, device performance management, and unified communications quality of experience monitoring.

Via a single Web-based management console, the NetQoS Performance Center integrates and analyzes data from multiple sources in customized views to help organizations optimize application delivery, solve problems faster, mitigate the risks from change, and make the most efficient use of resources.

From an intuitive, Web-based network monitoring and management console, organizations can access a top-down view of all applications — data, video, and voice—for an organization's entire network infrastructure. Detailed information is provided by the NetQoS product modules:

- NetQoS SuperAgent for end-to-end application response-time performance monitoring.
- NetQoS GigaStor for long-term packet capture and analysis.
- NetQoS ReporterAnalyzer for network traffic analysis.
- NetQoS NetVoyant for device performance management.
- NetQoS Unified Communications Monitor for VoIP and video quality of experience.
- NetQoS Trade Monitor for financial trading application latency monitoring

With role-specific views for different groups in an IT organization, such as network engineering, operations, managers and executives, and IP telephony management, the NetQoS Performance Center enables staff at all levels to:

- Measure end-user-to-end-application response times.
- Provide consistent application service delivery.
- Understand how infrastructure changes affect network and application performance.
- Isolate performance problems to the application, server, or network.
- Identify the applications and users consuming bandwidth, and when.
- Avoid unnecessary WAN costs.
- Manage the convergence of voice, video, and data.
- Correlate network performance to VoIP and unified communications quality of experience.

- Identify virus or denial of service attacks and unauthorized application usage.

The NetQoS Performance Center also provides an integration platform that works with other third-party applications. Organizations can export any NetQoS Performance Center network monitoring view to any third-party Web-based application with just a few mouse clicks. In addition, the NetQoS Performance Center has a published platform to display data from any third-party application.

Analysis

As stated in the Executive Summary, Forrester took a multistep approach to evaluate the impact that implementing the NetQoS Performance Center can have on an organization:

- Interviews with NetQoS marketing, product management, and sales personnel.
- Review and analysis with a Forrester analyst whose focus includes IT operations and infrastructure and other relevant technology.
- In-depth interviews with an organization currently using the NetQoS Performance Center.
- Construction of a financial framework for the implementation of the NetQoS Performance Center.

Interview Highlights

The in-depth interviews with the organization uncovered that:

- In 2004, the organization embarked on a coordinated real estate and data center consolidation project for its business units in North America and Latin America. With this consolidation initiative, the business units would be sharing IT services.
- The organization at that time did not have the technical ability for cost allocation of shared IT services. There was no existing standardized tool to accurately assess bandwidth utilization. Across the business units, there were different levels of expertise, and different "basic tools" were used. While a business unit could see the overall utilization over a specific circuit, the organization had "no idea of what was traveling on the circuit, what protocols were being used, who was using it, nor to what extent."
- To effectively implement a utility-based model for cost allocation on a per-business-unit basis in a multitenant, shared environment, the organization needed visibility into how the multiple services at its centralized data centers and key shared sites were consuming bandwidth, and how to associate bandwidth on one circuit among the various services or customers that were utilizing it.
- The organization assembled a team to identify and prioritize its requirements around network monitoring and management. This team evaluated 12 different tools and narrowed them down to a shortlist of three. Each of these three tools was put through a live product demo on the production network, and the results were evaluated. At the end of this process, the organization chose to implement the NetQoS Performance Center in 2005.

- While the original intent was to find a solution to support the collocation project, the features of the NetQoS Performance Center led the organization to start using the solution as their daily network monitoring tool for the wide area network. In addition to the network engineers, the organization's professional services team has also started using the tool to monitor internet gateways and key LAN networks.

- The organization's senior manager for networks cited "instant access to clear, accurate, and needed data" as being one of the most valuable features provided by the NetQoS Performance Center. The organization compared the results with other systems and was more than satisfied with the granularity of the information and the transparency of the network traffic that the NetQoS Performance Center presented. The quality of its utilization reports was also cited as a valuable feature.

- It was also noted during the interviews that the ability to establish custom virtual interfaces (CVI) as a "very quick and simple way" to isolate traffic associated with specific subnets, services, or entities was also "key to the selection" of the NetQoS Performance Center product suite. With this solution, the organization was able to provide full visibility into the current and historic network usage characteristics of the target organization by using their uniquely assigned IP ranges. The NetQoS Performance Center provided valuable information related to volume, conversations, and protocols used during a defined time period of interest, which helps to quantify the impact assessment and recommended actions. In the cases where a particular entity is dedicated to one business unit, the organization does not have to do any additional configuration with the CVI to extract the needed data.

- In interviews with a senior network manager of the organization, he noted that "the out of the box reporting is more than suitable for us [the organization] to understand how that site is using its bandwidth and hosted resources." In the instance of congestion problems, historical data contrasted with current data in the reports allows the organization to identify the source of the problem very quickly.

- The organization purchased the NetQoS ReporterAnalyzer and NetQoS SuperAgent, modules of NetQoS Performance Center for its initial implementation. The organization also recently purchased the NetQoS NetVoyant and Anomaly Detector modules for device performance management and proactive alerting when troublesome situation or behavior is recognized. Given the recent timing of the purchase, the cost and benefit factors for the NetQoS NetVoyant and Anomaly Detector modules will not be included in this analysis.

- With the success of the NetQoS Performance Center in North America and Latin America, the organization decided to roll out a global implementation that covers the WAN network in every country where it has a presence, apart from a few European countries that are currently committed to a contract with a different WAN service provider.

TEI Framework

Introduction

From the information provided in the in-depth interviews, Forrester has constructed a TEI framework for those organizations considering implementation of the NetQoS Performance Center. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that impact the investment decision.

Framework Assumptions

Table 2 lists the discount rate used in the present value (PV) and net present value (NPV) calculations and time horizon used for the financial modeling.

Table 2: General Assumptions

Ref.	General assumptions	Value
	Discount rate	10%
	Length of analysis	Three years

Source: Forrester Research, Inc.

Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their finance team to determine the most appropriate discount rate to use within their own organizations.

In addition to the financial assumptions used to construct the cash flow analysis, Table 3 provides the fully loaded compensation assumptions used within this analysis.

Table 3: Salary Assumptions

Ref.	Metric	Calculation	Value
A1	Hours per week		40
A2	Weeks per year		52
A3	Hours per year (M-F, 9-5)		2,080
A4	Hours per year (24x7)		8,736
A5	Network engineer		$125,000
A6	Hourly	(A5/A3)	$60.10

Source: Forrester Research, Inc.

Costs

The key cost categories associated with implementing the NetQoS Performance Center are: 1) licenses for NetQoS Performance Center components; 2) associated maintenance fees; 3) preplanning and implementation costs; 4) training costs; and 5) ongoing management and administration costs.

The financial analysis is made over a three-year period. The following are the cost inputs to the financial model.

NetQoS Performance Center License Fees

In North and Latin America, the organization is using the NetQoS Performance Center to monitor more than 350 routers spread out across 300 sites and 20 data centers. The organization initially purchased licenses for ReporterAnalyzer and SuperAgent over a three-year period. After the initial implementation, the organization added additional SuperAgent and Reporter Analyzer license packages each year. This model assumes a discount of 10%, resulting in a total cost of **$216,000** in license fees.

Table 4: NetQoS Performance Center Licenses

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	NetQoS ReporterAnalyzer		87,500		15,000	15,000
A2	NetQoS SuperAgent		57,500		65,000	0
A3	Discount		10%		10%	10%
At	NetQoS Performance Center licenses	(A1+A2)*(1-A3)	130,500	-	72,000	13,500
Ato	Total (original)		($130,500)	$0	($72,000)	($13,500)

Source: Forrester Research, Inc.

NetQoS Performance Center Maintenance Fees

Maintenance fees for the NetQoS Performance Center solution are estimated at 18% of the license cost. This includes a NetQoS single-tier support team comprising staff with engineering or computer science degrees, a guarantee that your initial support call goes to locally based staff, free attendance to annual customer Symposia in the US and Europe, customer Webinars and local workshops, hardware warranty, and an assigned “single point of contact” customer care account manager. Maintenance fees are also projected to increase by 5% annually. Total maintenance fees for the organization over the three-year analysis are **$44,055.**

Implementation Costs

One of the important features of the NetQoS Performance Center solution that drove its selection was its short implementation time. The organization estimates that it took two internal staff two days to roll out the NetQoS Performance Center. They activated the core system consisting of Reporter Analyzer and SuperAgent consoles as well as collection devices. At a fully loaded compensation of $125,000 annually, internal labor that the organization spent for the solution is estimated at $1,923. The organization also used NetQoS professional services to roll out the solution at a fee of $11,900

for the two components (ReporterAnalyzer and SuperAgent). Total implementation costs for the solution are estimated at **$13,823**.

Training Costs

The organization estimated training fees of $3,000 for the NetQoS Performance Center implementation. Twenty engineers spent 1.5 days in user training while four engineers spent five days in administrator training. At a fully loaded compensation of $125,000 annually, the cost to the organization of sending these personnel to training is estimated at $24,038. The organization estimates that for this project, the total cost of training, including NetQoS training fees and engineer time, is **$27,038**.

Administrative Costs

The organization estimates the ongoing management and administrative costs of the NetQoS Performance Center at 5 hours a week (or 260 hours a year) for one person. This includes the cost of creating user accounts, assistance to users in report creation and review, and other small customization requirements. At a fully burdened compensation of $125,000 annually, ongoing internal management and administration will cost the organization **$15,625** annually.

Total Costs

Table 5 summarizes all the costs associated with the organization's implementation of the NetQoS Performance Center.

Table 5: Total Non-Risk-Adjusted Costs

Costs	Initial	Year 1	Year 2	Year 3	Total
NetQoS Performance Center licenses	130,500		72,000	13,500	216,000
Maintenance fees		26,100	15,120	2,835	44,055
Implementation costs	13,823				13,823
Training costs	27,038				27,038
Administrative costs		15,625	15,625	15,625	46,875
Total	$171,362	$41,725	$102,745	$31,960	$347,792

Source: Forrester Research, Inc.

Benefits

According to the organization, the main benefits of using the NetQoS Performance Center have been improved visibility into the network, leading to productivity savings and infrastructure savings achieved at a lower cost when compared to the alternative of implementing a probe or agent-based network monitoring solution. A summary of the total economic benefit is listed below, followed by details of how the economic benefit was calculated.

- **Productivity savings.** The transparency and accurate information enabled by ReporterAnalyzer and SuperAgent have led to shorter problem resolution time for network incidents and issues. "These tools give you a good foundation for being able to get to the problems much quicker," the organization's senior manager for network product observed. This leads to productivity savings for personnel involved in troubleshooting incidents and general network monitoring and problem resolution. This is estimated at $137,380 annually.

- **Infrastructure savings.** The transparency that the NetQoS Performance Center has brought to understanding the utilization of the different classes of service on the organization's wide-area network (WAN) has saved the organization the cost of some bandwidth upgrades. "Without the insight provided by the NetQoS Performance Center, you're going to have to err on the side of caution, and buy a larger circuit than what you really need," said the organization's senior manager for network product. The organization estimated that it has avoided spending $100,000 annually on bandwidth upgrades as a result of using the NetQoS Performance Center.

- **Cost avoidance savings.** In the organization's initial evaluation of a dozen tools, the NetQoS Performance Center was the only solution that didn't require probes to be deployed to each monitored device. Instead, the solution derives its data from passive monitoring technology and NetFlow information available on Cisco routers. By choosing the NetQoS Performance Center, the organization has saved the cost of implementing a probe-based monitoring solution, which includes associated fees to install and maintain the probes, as well as engineer time to manage the rollout. The cost savings to an organization for this category is estimated at $467,308.

Productivity Savings — Incidents

The organization estimates that thanks to using the NetQoS Performance Center, it has saved 42 hours of resolution time per critical incident. The organization assumes that at a rate of one critical incident every four months over the entire network, it has saved 126 hours a year. NetQoS Performance Center has also shortened problem resolution for minor incidents, such as performance issues due to misconfigurations, or large downloads. The organization estimates savings for troubleshooting minor incidents at 2 hours a month. Conservatively estimating that this affects only half of the 30 business units where the NetQoS Performance Center is deployed, the organization estimates savings at 360 hours a month. Total productivity savings for incident resolution are $87,620 over a three-year analysis.

Table 6: Productivity Savings — Incidents

Ref.	Metric	Calculation	Per Period	Year 2	Year 3	Total
A1	Number of hours saved for critical incidents per year	42*3	126			
A2	Number of hours saved for regular incidents per year	2*15*12 mo.	360			
A3	Hourly rate per person (rounded)		$60.10			
At	Productivity savings - incidents	(A1 + A2)*A3	29,207			
Ato	Total (original)		$29,207	$29,207	$29,207	$87,620

Source: Forrester Research, Inc.

Productivity Savings — Daily Monitoring And Issue Resolution

Because of the visibility and transparency provided by the NetQoS Performance Center, network engineers "now have better control over what's happening on the network" and "have access to information much quicker." This gives the engineers more efficiency in answering questions, problem resolution, and decision-making, and leads to more efficiency in such instances as

application deployment and consolidation projects. The organization estimates that this has saved the 30 engineers who use NetQoS Performance Center 10 hours a month in daily network monitoring and problem resolution.

The model conservatively estimates that only 50% of this time is captured as productive work. At a fully burdened compensation of $125,000 annually (or $60.10 per hour), this translates to savings of $324,519 over three years.

Table 7: Productivity Savings — Daily Monitoring And Issue Resolution

Ref.	Metric	Calculation	Per period	Year 2	Year 3	Total
A1	Number of engineers		30			
A2	Hourly rate per worker		$60.10			
A3	Number of hours (saved)		120.0			
A4	Percent captured		50%			
At	Productivity savings — daily monitoring and issue resolution	A1*A2*A3*A4	108,173			
Ato	Total (original)		$108,173	$108,173	$108,173	$324,519

Source: Forrester Research, Inc.

Cost Avoidance — Bandwidth Upgrade

By investing in the NetQoS Performance Center, the organization estimates that it has avoided the cost of upgrading network bandwidth from its service providers to provide the level of performance needed by their organization. With the solution, the organization "has a better understanding and a historical baseline of what is being used, how it's being used, and how we can contain our costs and not waste as much." These infrastructure savings are estimated at $100,000 a year.

Table 8: Cost Avoidance Of Bandwidth Upgrade

Ref.	Metric	Per period	Year 2	Year 3	Total
A1	Cost avoidance of bandwidth upgrade	100,000			
Ato	Total (original)	$100,000	$100,000	$100,000	$300,000

Source: Forrester Research, Inc.

Cost Avoidance Savings — Alternative Probe-Based Solution

The organization ultimately chose not to go with a probe-based solution because the complexity of installation and maintenance of these devices would have caused too much additional burden on the network team. Issues included planning downtime around resource availability and following the change management process to arrange the change window at the site so as not to affect business operations, support and maintenance of the discrete components, depreciation of equipment, and associated risks. The organization estimates that the overall cost of installing a probe solution would

be $1,000 per site. At 225 sites, the organization has saved $225,000 by implementing the NetQoS Performance Center instead.

Table 9: Cost Avoidance — Probe Solution

Ref.	Metric	Calculation	Per period	Year 2	Year 3	Total
A1	Number of assets		225			
A2	Cost per asset		$1,000			
At	Direct cost avoidance — probe solution	A1 * A2	$225,000			
Ato	Total (original)		$225,000	$0	$0	$225,000

Source: Forrester Research, Inc.

The organization also estimates that implementing a probe-based solution would have been a major project requiring approximately two network engineers and one project manager around eight months to roll it out. This work includes tasks such as installation of the probes, cable, configuration and testing the probes at each site. A project of this scope would also require project initiation; planning; gathering as-built site survey information to arrange for the physical space; electrical and network patching needed of the unit; and coordinating the change window at each site to accommodate the network outage, allowing for some evening or weekend work as some sites do not permit this work to be performed during normal business hours. The organization noted that this would have put a tremendous burden on the project manager to accommodate these scheduling considerations and limitations, resulting in a long drawn-out implementation period. At an assumption of 4.2 weeks per month and fully burdened compensation of $60.10 per hour, the organization saved an estimated $242,308 in labor costs by implementing the NetQoS Performance Center instead of a probe-based solution.

Table 10: Cost Avoidance — Labor For Probe Solution

Ref.	Metric	Calculation	Per period	Year 2	Year 3	Total
A1	Number of workers (saved)		3			
A2	Yearly rate per worker		$60.10			
A3	Number of hours		1,344			
At	Direct cost avoidance — labor for probe solution	A1*A2*A3	242,308			
Ato	Total (original)		$242,308	$0	$0	$242,308

Source: Forrester Research, Inc.

Business Impact From Network Incidents

Earlier, the organization estimated that it has saved 360 hours annually in problem resolution time for minor network incidents and 126 hours a year in critical incident downtime. The generally accepted method of valuing the risk of losses from external and internal incidents is to consider an amount of a potential loss, assume a frequency of loss, and estimate a probability for incurring the

loss. The organization estimated that dollar loss per hour of unplanned downtime due to a network incident would be $10,000 at standard sites and more than $100,000 at major sites, with even higher losses realized at factories that rely on SAP to process orders, ensure on-time processing/delivery to customers, incurrence of overruns, overtime, shutdown of some production lines, idle workers, and manual efforts to counter the effects of the outage. Forrester conservatively applies the $10,000 loss per hour of unplanned downtime figure to the frequency of minor incidents. Further assuming the probability of a loss of that amount to be 3%, the resulting avoided cost is $108,000 annually, as shown in Table 11. Users of this study are encouraged to use this method with their own assumptions for potential penalty amounts, frequency, and probability. A more comprehensive, expanded method for making this calculation using ranges of probabilities and exposures is described in the Risk section below.

Table 11: Reduced Risk Of Loss From Network Incidents

Ref.	Metric	Calculation	Per period	Year 2	Year 3	Total
A1	Cost of disruption per hour		$10,000			
A2	Hours of downtime due to network incidents		360			
A3	Probability of loss		3%			
At	Reduced risk of loss from network incidents	A1*A2*A3	$108,000			
Ato	Total (original)		$108,000	$108,000	$108,000	$324,000

Source: Forrester Research, Inc.: Total Benefits

Total Benefits

Table 12 illustrates the total three-year benefits as a result of the implementation of the NetQoS Performance Center in the organization (business units in North and Latin America). The total present value benefits equates to $1,283,734.

Table 12: Total Benefits — Non-Risk-Adjusted

Benefits	Initial	Year 1	Year 2	Year 3	Total	Present value
Productivity savings — incidents		29,207	29,207	29,207	87,620	72,633
Productivity savings — monitoring and resolution		108,173	108,173	108,173	324,519	269,010
Cost avoidance — bandwidth upgrade		100,000	100,000	100,000	300,000	248,685
Direct cost avoidance — probe solution		225,000			225,000	204,545
Direct cost avoidance — labor for probe solution		242,308			242,308	220,280
Reduced risk of loss from network incidents		108,000	108,000	108,000	324,000	268,580

Total		$812,688	$345,380	$345,380	$1,503,447	$1,283,734

Source: Forrester Research, Inc.: Total Benefits

Risk

Risk is the third component within the TEI model; it is used as a filter to capture the uncertainty surrounding different cost and benefit estimates. If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates.

Forrester defines two types of investment risk associated with this analysis: implementation risk and impact risk. Implementation risk is the risk that a proposed technology investment may deviate from the original resource requirements needed to implement and integrate the investment, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the technology investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates. Quantitatively capturing investment risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the return on an investment.

The following implementation risk is identified as part of this analysis:

- Administrative, training, and implementation costs could be higher than originally anticipated for the NetQoS Performance Center solution.

The following impact risks are identified as part of the analysis:

- The amount of infrastructure savings may be lower than originally anticipated due to cheaper actual costs for bandwidth upgrades as technology improves.

- The amount of labor savings from direct cost avoidance of implementing a probe-based solution may be lower than originally anticipated due to uncertainty in the estimates around the amount of time and labor required from network engineers to implement the solution.

Steps For Measuring Investment Risk

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. TEI applies a probability density function known as triangular distribution to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit estimate. The expected value — the mean of the distribution — is used as the risk-adjusted cost or benefit number. The risk-adjusted costs and benefits are then summed to yield a complete risk-adjusted summary and ROI.

In this study, Forrester discovered that engaging with NetQoS was a relatively low-risk endeavor, as expressed by the interviewed organization, and applied risk factors listed in the table below to selected costs and benefits to arrive at a risk-adjusted number. The organization noted that initial apprehensions of risk around the accuracy and granularity of the results from NetQoS were mitigated by testing the NetQoS Performance Center results with other competing technology

during the evaluation period. The organization also engaged NetQoS professional services during installation to mitigate risk.

Table 13 provides a risk-adjusted breakdown of the costs incurred. Table 14 provides a risk adjusted breakdown of the benefits received.

Table 13: Total Costs — Risk-Adjusted

Costs	Step 1: Original estimate	High	Low	Step 2: Risk adjustment	
				%	value
NetQoS Performance Center licenses	$216,000	$216,000	$216,000	100%	$216,000
Maintenance fees	$44,055	$44,055	$44,055	100%	$44,055
Implementation costs	$13,823	$17,970	$13,823	110%	$15,205
Training costs	$27,038	$31,094	$27,038	105%	$28,390
Administrative costs	$46,875	$53,906	$46,875	105%	$49,219

Source: Forrester Research, Inc.

Table 14: Total Benefits — Risk-Adjusted

Benefit	Step 1: Original estimate	High	Low	Step 2: Risk adjustment	
				%	value
Productivity Savings — incidents	$87,620	$87,620	$87,620	100%	$87,620
Productivity Savings – monitoring and resolution	$324,519	$324,519	$324,519	100%	$324,519
Cost avoidance — bandwidth upgrade	$300,000	$300,000	$150,000	83%	$249,00
Direct cost avoidance — probe solution	$225,000	$225,000	$207,000	97%	$218,250
Direct cost avoidance — labor for probe solution	$242,308	$242,308	$218,077	97%	$235,038
Avoided cost of loss from network incidents	$108,000	$108,000	$54,000	83%	$89,640

Source: Forrester Research, Inc.

Flexibility

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

The NetQoS Performance Center can potentially enable future benefits in other areas within the organization such as:

- Use of the NetQoS Performance Center by other teams, outside of the network engineering organization. IS (Information Services) is the professional services arm of the organization, a team responsible for applications, LAN infrastructure, and areas outside the wide-area network. IS has started using the NetQoS Performance Center solution for configured devices to understand traffic usage and loads as related to applications. With the solution's scalability, the organization has to minimally invest in configuration costs and support costs for account and report creation to accommodate these new teams.

- Addition of complementary tools for network monitoring and analysis, apart from ReporterAnalyzer and SuperAgent, will further enhance the efficiency and effectiveness of the network management team. The organization is already exploring product modules in the NetQoS Performance Center suite, such as Anomaly Detector, which helps users understand when performance is abnormal and starts to skew out of baseline, for their global expansion initiative. The organization has already recently purchased the NetQoS NetVoyant module for device performance management.

While Forrester believes that organizations purchasing the NetQoS Performance Center can take advantage of these flexibility options, quantification (using the financial industry standard Black-Scholes or the binomial option pricing models) of the additional value associated with these options for this customer would require scenario development and forward-looking analysis that is not available at this time.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company (see Appendix A for additional information regarding the flexibility calculation).

TEI Framework: Summary

Considering the financial framework constructed above, the results of the costs, benefits, risk, and flexibility sections using the representative numbers can be used to determine a return on investment, net present value, and payback period. Table 15 shows the consolidation of the numbers for the organization.

Table 15: Total Costs And Benefits, Non-Risk-Adjusted

Ref.	Project cash flow	Calculation	Initial cost	Year 1	Year 2	Year 3	Total	PV/NPV
E1	Total costs		($171,362)	($41,725)	($102,745)	($31,960)	($347,792)	($318,219)
F1	Total benefits		$0	$812,688	$345,380	$345,380	$1,503,447	$1,283,734
G1	Net savings		($171,362)	$770,963	$242,635	$313,420	$1,155,656	$965,515
H1	ROI	(F1-E1)/E1						303%
P3	Payback period							2.7 months

Source: Forrester Research, Inc.

Table 13 below shows the risk-adjusted values, applying the risk-adjustment method indicated in the "Risks" section.

Table 16: Total Costs And Benefits, Risk-Adjusted

Ref.	Project cash flow	Calculation	Initial cost	Year 1	Year 2	Year 3	Total	PV/NPV
J1	Total costs		($174,096)	($42,506)	($103,526)	($32,741)	($352,870)	($322,896)
K1	Total benefits		$0	$763,308	$310,020	$310,020	$1,383,348	$1,183,054
L1	Net savings		($171,362)	$720,802	$206,494	$277,279	$1,030,478	$860,158
M1	ROI	(K1-J1)/J1						266%
P3	Payback Period							2.9 months

Source: Forrester Research, Inc.

It is important to note that the values used throughout the TEI Framework are based on in-depth interviews with the organization. Forrester makes no assumptions as to the potential return that other organizations will receive within their own environment. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of implementing the NetQoS Performance Center.

Study Conclusions

Based on information collected in interviews with a current NetQoS Performance Center customer, Forrester found that organizations can realize benefits in the form of productivity savings through improved efficiency and problem resolution, infrastructure savings through avoiding the need for bandwidth upgrade, and lower costs through avoidance of cost outlays for an alternate solution using probe-based technology.

The financial analysis provided in this study illustrates the potential way an organization can evaluate the value proposition of the NetQoS Performance Center. Based on information collected in the in-depth customer interviews, Forrester calculated a three-year risk-adjusted ROI of 266% for the interviewed organization with a payback period of less than three months. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

Based on these findings, companies looking to implement the NetQoS Performance Center can see gains around the benefits of improved efficiency in network management and problem resolution, productivity savings, and cost avoidance. Using the TEI framework, many companies may find the potential for a compelling business case to make such an investment.

Table 17: ROI: Original And Risk-Adjusted

Summary financial results	Original estimate	Risk-adjusted
ROI	303%	266%
Payback period (months)	2.7	2.9
Total costs (PV)	($318,219)	($322,896)
Total benefits (PV)	$1,283,734	$1,183,054
Total (NPV)	$965,515	$860,158

Source: Forrester Research, Inc.

Appendix A: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility. For the purpose of this analysis, the impact of flexibility was not quantified.

Benefits

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the forms of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: the likelihood that the cost and benefit estimates will meet the original projections and the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

Flexibility

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

Appendix B: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set a discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their organization to determine the most appropriate discount rate to use in their own environment.

Net present value (NPV): The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

Present value (PV): The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total net present value of cash flows.

Payback period: The breakeven point for an investment. The point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A Note On Cash Flow Tables

The following is a note on the cash flow tables used in this study (see the Example Table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Years 1 through 3 are discounted using the discount rate shown in Table 2 at the end of the year. Present value (PV) calculations are calculated for each total cost and benefit estimate. Net present value (NPV) calculations are not calculated until the summary tables and are the sum of the initial investment and the discounted cash flows in each year.

Example Table

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.

Appendix C: About The Project Manager

Michelle Bishop
Consultant

Michelle Salazar Bishop is a consultant with Forrester's Total Economic Impact™ (TEI) consulting practice. The TEI methodology focuses on measuring and communicating the value of IT and business decisions and solutions, as well as providing an ROI business case based on the costs, benefits, risks, and flexibility of investments.

Prior to joining Forrester, Michelle held leadership roles in operations, technology, and marketing in such large organizations as Shell Corporation and Avaya. At Shell, she was a product manager for LPG retail distribution initiatives, as well as project lead for quality and information security at Shell Philippines. While working at Avaya, she led the inventory reduction program and consulted on various aftermarket operations projects. Michelle also came to Forrester with process improvement and account management experience in high-growth startups in media and digital services.

Michelle holds a BS in industrial engineering from the University of the Philippines and an MBA from the MIT Sloan School of Management.