Increasing Competitiveness through Ongoing Operational Excellence
Streamlining IT and network operations to improve end user quality of experience and sustain growth

Traditionally, the majority of network provider efforts to create a high Quality of Experience (QoE) for end users have been focused on deploying and maintaining a state-of-the-art network infrastructure to provide connectivity and advanced communication services. More recently, these efforts have included new business processes that improve service, such as the introduction of detailed billing and self-care portals. But to achieve business objectives, increase competitiveness, and improve end user QoE network providers need to achieve a level of operational excellence — a philosophy of leadership, teamwork and problem solving resulting in continuous improvement throughout the organization — in all functional areas. This requires effective integration of network transformation programs with efforts to consolidate the previous separate worlds of IT, network operations and customer care. Based on Pyramid Research and Alcatel-Lucent market analysis, these three areas represent approximately 36 percent of a provider’s operating expenses. A proper integration strategy supported by ongoing measurement and management will create a streamlined operational environment that improves competitiveness by focusing all business operations to deliver the highest QoE to end users at all times. The integration process can begin with optimizing resources and service operations to reduce costs, enabling new services creation and efficient customer care.
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It’s All About the End User

Reduce churn. Increase average revenue per user. Lower operating costs. Improve margins. Meet rising demand for a myriad of services — fast. Differentiate. Go beyond doing it faster and better than the other guy by anticipating and delivering end user wants and needs. Be the provider of choice.

If there have been any constants in the business of delivering communications services over the past few years they have come from the ongoing efforts of network providers around the world to achieve these objectives. In a changing environment and increasingly competitive landscape, network providers have struggled to find the key to success in these areas. Some have focused on improving the network to ensure it can deliver high quality voice, data and multimedia services. Some have concentrated on developing advanced, Web 2.0 services by exposing key network assets to application and content providers (ACPs) under the banner of application enablement. Some have looked at alternatives to manage their networks through reducing their costs and focusing on the customer experience. Some have opted to replace aging, high maintenance equipment in their data centers. And some have shifted their gaze inward and introduced new processes that streamline the way the business is managed.

The approaches are as varied from one network provider to the next as are their networks. And there doesn’t seem to be — nor should there be — one definitive solution. But what all approaches have in common is that they all stem from one basic realization: Winning in this market is all about the end user.

Regardless of which path is taken, the ultimate goal is to anticipate end user needs and maintain a competitive edge by improving the end user quality of experience (QoE). This is best achieved by ensuring that each individual consumer and enterprise end user is satisfied and continues to be satisfied with everything a network provider has to offer — the network, the services, and the quality of service (QoS) — at all levels. However, addressing one area of the business alone will not lead to ultimate success. To achieve business objectives, increase competitiveness, and improve end user QoE network providers need a better way to manage their business at the network and operations layers. They need to achieve operational excellence.

Unfortunately, operational excellence is one of those business catchphrases with many meanings. A simple Google search reveals pages of links and accompanying documentation that outline the concept and the philosophy as it applies to a variety of market sectors, from manufacturing to service-oriented enterprises.

Wikipedia defines it as “a philosophy of leadership, teamwork and problem solving resulting in continuous improvement throughout the organization by focusing on the needs of the customer, empowering employees, and optimizing existing activities in the process.”

In a nutshell, operational excellence is not just concerned with the functions of the operations group in an organization. It applies to the operations of all functional areas. What this means to a network provider is in the mind of the beholder. All network providers will take this concept and determine what operational excellence is in their own environment based on their priorities and those of their customers. Likewise, efforts to achieve operational excellence will vary from one network provider to the next.

Alcatel-Lucent believes operational excellence for network providers is the optimum balance between three key objectives:

- Managing and scaling network bandwidth and capacity efficiently to accommodate ever-changing demands
- Improving financial performance and Return on Investment (ROI) by lowering operating expenditures (OPEX) and managing investments for sustainable growth
- Ensuring QoE meets or exceeds end user expectations

Achieving this balance requires effective integration of network transformation programs with efforts to consolidate the previous separate worlds of IT and network operations. A strong integration strategy supported by ongoing measurement and management will create a streamlined operational environment that improves competitiveness by focusing all business operations on delivering the highest QoE to end users at all times.

**Placing Operational Excellence in a Network Provider Framework**

The International Telecommunication Union (ITU) provides guidelines that tie QoE with the QoS associated with the delivery of services to end users. These guidelines outline delay, delay variation, and information loss and provide performance targets that meet user expectations for various applications, such as conversational voice, audio streaming, and Web browsing. The ITU also provides a model for estimating the performance of data applications over Internet Protocol (IP) networks, which covers network, application, and perceptual performance.

Meanwhile, the TeleManagement Forum (TM Forum) looks at QoE from the perspective of service level agreement (SLA) management. It defines Key Quality Indicators (KQIs) and Key Performance Indicators (KPIs) as measurements of perceived quality rather than network performance. And Alcatel-Lucent Bell Labs defines QoE as the measure of how well a system or an application meets the user’s expectations based on user-perceived effects, such as degradation in voice or video quality.²

These and other definitions explain QoE within the context of network provider efforts to improve end user satisfaction. The more satisfied end users are with the overall experience offered by the network provider, the more likely they are to respond to up-sell and cross-sell offers, generate new business by word-of-mouth, have a lower cost to serve, and the less likely they are to churn (Figure 1).

**Figure 1. Customer satisfaction drives network provider business benefits³**

Traditionally, the majority of network provider efforts to create a high QoE for end users have been focused on deploying and maintaining a state-of-the-art network infrastructure to provide connectivity and advanced communication services. More recently, these efforts have included new business processes that improve service, such as the introduction of detailed billing and self-care portals.

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But operational excellence means going beyond independent efforts to improve network infrastructure, services, or customer service. It includes every aspect of the business that contributes to an end user’s overall experience. And it requires network providers to move from network-centric to service-centric KPIs and KQIs that shift the metrics from measuring the network to those measuring services and experience. This requires proactive planning across the entire organization, including network, marketing, and customer care.

To achieve this, network providers must look at their network operations and their business operations as an integrated whole and optimize them both to efficiently and effectively meet end user expectations, from the moment they sign for service, through service delivery, to upgrades, billing and right through to the web portal (Figure 2).

![Figure 2. Customer perception and key satisfaction drivers](image)

Applied properly, operational excellence results in end users who are intrigued enough by a special promotion to visit the promotional portal on the network provider’s website. Once there, the portal draws the end user in further by allowing easy navigation through a myriad of options that can be customized to fit individual service preferences. Policy and privacy statements are easily found and understood. Service control and billing functions can be tailored to fit lifestyle and administration preferences. And sign-up and activation are simple and efficient.

Beyond the initial sale, the end user’s overall experience is enhanced by the service’s function. Availability, reliability, and QoS are continuously of the highest level. And if there is a problem, the end user is notified in advance, or can quickly and easily access support personnel that can knowledgeably answer key questions. This level of experience is maintained throughout the relationship with accurate, detailed billing, ongoing notifications of service upgrades and options, and easily accessible addition and/or change options to the service via an intuitive, security-enabled web portal, or an efficient call center operation that can make modifications as required.

This integrated approach worked well for a Tier 1 fixed/mobile network provider. Before launching a new triple play service, the network provider established new KQIs and KPIs. Every division in the organization worked together to achieve these benchmarks and deliver complete customer satisfaction. In addition, the benchmarks were tracked to ensure the organization as whole achieved the desired level of service. As a result, this proactive management approach helped the network provider grow its subscriber base by 175,000 in just 12 months.

What this experience shows is that the required level of excellence touches a network provider’s entire operation. Therefore, achieving it requires a phased process supported by ongoing measurement, assessment and management. But because every network provider’s business is unique and business objectives vary by market, there is no one-size-fits-all solution. However, the process will usually involve four key areas of focus:

• IT infrastructure transformation and operations (desktop, IT datacenters, VAS servers, LAN/WAN)
• Cost optimization (network utilization and performance, operating and maintenance costs, and QoE)
• Integration and interoperability across platforms
• Managing headcount and network OPEX

How these activities are applied and integrated within a network provider’s environment will be determined by each provider as part of a customized operational excellence development process.

**IT infrastructure transformation**

Like most enterprises, a network provider’s IT infrastructure is the foundation of the organization’s internal and external business processes. Therefore, like most enterprises, network providers are faced with the challenge of improving IT infrastructure and operations to enhance the quality and effectiveness of those processes while at the same time containing IT-related costs. Efforts in these areas may include:

• Streamlining and optimizing multiple technology assets, such as networking equipment, servers, storage and software
• Adopting Web-based services that automate a variety of support and maintenance functions to simplify system management and cut operations costs
• Introducing remote hardware event monitoring and automated incident notification to help prevent potentially critical failures

But network providers have an additional concern. To compete effectively with their traditional competitors, as well as with new and emerging players, most network providers have realized that they may need to transform their business. This requires adopting new business models and arrangements that leverage the capabilities of their networks to support new relationships with third party ACPs. By working cooperatively with these new partners, network providers can develop and deliver new, advanced and personalized services that address end user demand for access to multimedia applications and services, anywhere and anytime.

As a key component of an operational excellence integrated strategy, an effective business transformation will require convergence of best in class IT and telecom technologies and processes. For some network providers this may include retirement of legacy IT and network infrastructure assets. This may be followed by a build-out of telecommunications infrastructure that is tightly integrated with IT technologies to bring network operating expenditures onto an enterprise IT cost curve while maintaining the traditional reliability of a telecom infrastructure. And it may include adoption of managed services for key IT and network infrastructure assets.

Whatever the approach, an effective transformation will lead to the creation of tighter links between the many domains that make up a telecom infrastructure and a set of new capabilities in the areas of real-time customer and business intelligence, charging, customer service processes, and new service delivery.
Cost optimization

Since most network providers have already embarked on cost optimization efforts, this paper will not review those activities. However, cost optimization does play a key role in any effort to achieve operational excellence. That’s because in today’s evolving market revenue is centered less on the individual user and more on the traffic transported between users (data, media, and bits). As a result, overall usage is a key measure of revenue.

As part of an integrated operational excellence strategy any network provider optimization efforts should be focused on maximizing margins while reducing costs. The overall goal should be to achieve the lowest total cost of ownership (TCO) per transported bit by focusing cost transformation efforts on creating a High Leverage Network™ architecture, achieving non-linear cost reductions, and making strategic investments. With these efforts, network optimization savings will vary widely — from five percent to 65 percent — but the improvements will help lead an overall transformation program.

There is no universal solution to the challenge of increasing network value through cost optimization. The market pressures and network architecture each network provider faces are unique. But, as a general rule, reducing OPEX and capital expenditures (CAPEX), while increasing revenue per transported bit depends on the successful transformation of operations and IT into a next-generation, high-value network. And to remain viable, that network must be capable of providing end users with the services and applications they require at the moment, while remaining flexible and profitable far into the future.

Integration and interoperability across platforms

An effective operational excellence strategy should include the integration of automated operational support and billing support functions to enable better measurement and attainment of QoE based on KQIs and KPIs. This is important because operational support is needed to track inventory, as well as introduce and provision services to ensure end users get what they need when they need it. Business support focuses on customer relationship management, which includes orders, bill processing and payments. With changes in the competitive market and customer expectations, impeccable delivery is required in both these areas for good QoE from the onset. But it must be achieved cost-effectively. If it is, it enables the network provider to overcome the hurdles of introducing new services with more agility than competitors.

Until recently, KPIs have been used by network providers to measure the performance of their networks. However, because they are network-centric, KPIs cannot be used to measure the performance or quality of the services the network delivers. As a result, most network providers also use KQIs to get a better indication of service quality based on the performance of a product, product component, service, or service element. By building SLAs based on both sets of indicators, network providers can establish service quality metrics against which to measure end user QoE. And these metrics can be supported by service quality management processes in all business support system (BSS) and operations support system (OSS) functions.

Effective monitoring of QoE and SLA management is a key requirement for operational excellence. It should include the integration of network resource-facing services (hardware, protocols) and customer-facing services, as well as ongoing measurement of end-to-end QoE so that in cases of poor QoE early fault localization is possible. Implemented properly this will improve problem resolution efforts by network operations center (NOC) staff by pinpointing actual problems so that they can be resolved in minutes rather than days. It will also enable impact analysis that allows network providers to plan a response to potential problems.

For more information about cost optimization, see the Alcatel-Lucent white paper “The New Economics of Telecom Networks: Bringing value back to the network”, Alcatel-Lucent 2009.
Any operational excellence efforts in this area should include automated problem detection and event resolution through permanent, service-aware, multi-domain monitoring, which enables:

- Continuous improvement of network/service configurations to reduce repeat problems
- Lower OPEX because less maintenance work will be required as a result of fewer problems, thereby creating a higher QoE based on better service delivery
- Higher revenue as a result of increased customer satisfaction that will lower churn and may allow capture of a competitor’s churn
- Higher average revenue per user (ARPU) because customers will be more likely to subscribe to more services, and because there will be a lower burden on a customer care infrastructure

Managing headcount and network OPEX

To support the shift to more services-centric quality metrics, network providers must also rethink their approach to network management. Traditional network management requires ensuring connections are up and traffic flows properly. But this approach does not address end user QoS and QoE requirements. Effective delivery of advanced applications and services anytime, anywhere, and in the way that end users want them, requires a shift from traditional network-centric monitoring and management to services-centric management. This will put network providers in a position to proactively detect, diagnose and resolve services-related problems before end users know about them.

To make this possible, network providers need systems, procedures, capabilities and skills that may not be currently available in the NOC.

For many network providers, the additional investments required to make this network monitoring and management transition may not be a cost-effective option to undertake internally or alone. They may want to focus their investment capital and resources on the development of new revenue-generating services rather than on operations infrastructure. Furthermore, the expertise, processes and tools needed for a rapid and efficient transition to a services-centric operations management approach may not be readily available. Likewise, assembling a collection of internally developed services-centric management solutions can distract from application and service development and delivery, and may not completely address end user QoE issues. These and other business drivers may convince some network providers to outsource specific network operations functions to network equipment vendors.

These issues were dealt with recently by a Tier 1 network provider who realized that its aging technical workforce would soon leave it with a relatively small talent pool of qualified personnel from which to draw support in the near future. Given that 30 percent of OPEX is usually associated with staff, maintenance and operations support, the network provider opted to outsource its technical operations support functions through a managed services arrangement with its major equipment vendor. This offset and reduced a portion of its OPEX and ensured the right skills and expertise were in place for immediate and future requirements.

Often, services-centric operational excellence can only be properly addressed by a complete, managed, end-to-end, services-based operations solution. A managed solution expands the scope of operations management beyond traditional network boundaries and extends the network operations demarcation point to terminate where the network’s IP signal is converted into an application or service — the end user premise or device. In this way, SLAs are driven by end user service quality metrics, rather than network quality metrics and end user QoE is improved because:

- Performance is measured against service quality targets as perceived by the end user
- Proactive monitoring of end user service quality enables end-to-end proactive operations data analysis
- Service problems can be detected early

With this approach network providers can move from concentrating on the successful delivery of IP bits over the network to a more comprehensive, services-oriented operational excellence strategy.
However, few vendors can provide all the experience and expertise network providers will need for a true end-to-end managed services solution. A complete solution requires a mix of IT, telecoms and business expertise. Therefore, network providers will need to find a solution backed by the combined skills, experience and capabilities of senior players in the telecom and IT domains. In addition, because every network provider's market realities are different, these partners must be able to customize a solution to fit individual business objectives.

For example, in emerging markets, the related managed services solutions will need to support rapid geographical expansion while maintaining a lean and harmonized operation model. This requires flexibility and rapid scalability from managed services vendors to support quick mobilization of local resources, skills and expertise while leveraging global processes, tools and practices. While in mature markets network providers may need managed services to support changes in their business models and offerings. As a result, managed services solutions may need to support transformation of the business processes of an enterprise business arm, changes in the application and service offerings to existing customers, or the introduction of totally new technology and service capabilities.

Whatever the requirements, network providers need partners who can provide a set of already proven network, operations, IT and business process solutions that can be rapidly deployed and quickly become fully operational. In some cases, this may require the vendors to take full responsibility for the network and service infrastructure planning, deployment, integration and day-to-day operations, thereby allowing the network provider to focus on sales, marketing and product management efforts that will attract and retain customers and reduce end user churn.

**Alcatel-Lucent and Operational Excellence**

Ultimately, partnering with the right vendors may well be the best first step towards a complete, integrated operational excellence strategy, not just managed services. Because efforts to achieve operational excellence should be applied in all areas of the business, network providers may need to work with multiple vendors who can provide proven, best-in-class solutions for IT infrastructure transformation, cost optimization, OSS and BSS integration, and managed services. But dealing with multiple vendors requires network providers to coordinate many activities to achieve desired results, and this will distract efforts and resources from managing and growing the business.

To address this problem, Alcatel-Lucent offers products, solutions, and services for cost optimization, OSS and BSS integration, and managed services that can be combined to develop the core of an integrated, customized operational excellence strategy. Recently, these services were enhanced with the addition of IT infrastructure integration and optimization services through an alliance with HP.

The HP and Alcatel-Lucent alliance combines each company's capabilities and processes and aligns them with network provider operational excellence requirements to deliver the most effective operational excellence transformation solutions and services. By working with this alliance, network providers can eliminate the risks and costs associated with multiple vendor coordination, while implementing true end-to-end solutions in critical areas, such as network integration, OSS, BSS, and customer relationship management.

Together, Alcatel-Lucent and HP provide a set of consulting services, transformation governance, business process improvement, system integration, and managed services that can be leveraged to develop and implement a customized operational excellence strategy. These services are optimized to enable migration of legacy services onto a new, converged IT and telecom infrastructure that combines help desk, integrated service and network monitoring tools to support end-to-end service operations based on standardized processes and best practices. As a result, network providers get a telecom-grade revenue generating infrastructure that follows an enterprise IT cost/efficiency/agility curve.
Putting the Concept to Work

To date, the Alcatel-Lucent vision of operational excellence has been applied in different ways by network providers in a variety of markets worldwide.

Orange, Switzerland

Based on its operational excellence requirements, Orange Switzerland, a subsidiary of the France Telecom group, outsourced the operation and maintenance of its multi-vendor network to Alcatel-Lucent in 2008.

Orange Switzerland has been offering mobile communication services in Switzerland since 1999 and is currently the number two mobile provider in the Swiss mobile market. In 2005, the company activated its UMTS network in more than 20 Swiss cities enabling delivery of live TV and videotelephonie, as well as mobile data cards for work on the go. The company also operates the only GSM 1800 network in Switzerland, enabling it to provide a variety of messaging services including mobile e-mail, BlackBerry Internet, text messaging Short Message Service (SMS) and Multimedia Messaging Service (MMS).

Orange Switzerland’s market objective is to be “the most profitable mobile operator in Switzerland and become the leading provider of outstanding mobile life services, creating sustainable value for customers, employees and shareholders through excellent team work.” Its challenge is to accomplish this while delivering on its mandate to provide coverage to over 99 percent of the Swiss population, with high QoS.

To achieve its objectives, Orange needed an innovative strategy that would enable it to concentrate on the marketing, sales, and distribution of telecommunications services rather than management of the network required to deliver those services. It partnered with Alcatel-Lucent and became the first major operator in Switzerland to outsource its mobile network extension as well as the operations and maintenance of its multi-vendor network. This led to a rapid business transformation and the seamless migration of 146 network professionals to Alcatel-Lucent. Orange kept key strategic aspects of network development and planning as well as customer support related to the network.

As a result of this move, Orange realized immediate operational savings and continues to benefit from higher network operational efficiency. At the same time, the company has been able to concentrate on competitive new customer acquisition and retention strategies. In addition, network profitability has been augmented by the deployment of powerful automated network management tools through a new OSS platform.

VIVACOM

VIVACOM, the former state-owned Bulgarian Telecommunications Company, addressed its operational excellence objectives by outsourcing its fixed and mobile network operations to Alcatel-Lucent.

Once the monopoly telecom operator in Bulgaria, VIVACOM offers a full range of services, including fixed and mobile telephony, Asynchronous Digital Subscriber Line (ADSL) broadband Internet and data transfer. It also operates Bulgaria’s largest and best-developed telecom infrastructure, serving over 2.6 million fixed phone lines nationwide.

As the former state-owned incumbent, the company was burdened with an aging network infrastructure. In addition, it was facing competitive challenges created by deregulation, which resulted in new mobile companies entering the market and eroding its customer base with sophisticated services. To address competition and reduce revenue loss, VIVACOM required extensive technical and customer service transformation, but it realized it could not undertake this change by itself.
VIVACOM opted for a five-year outsourcing partnership with Alcatel-Lucent for all end-to-end, fixed and mobile network operations. As part of the process, 3,000 VIVACOM network support employees were transferred to Alcatel-Lucent. In addition, Alcatel-Lucent provided consulting services to support the sale of aging and redundant buildings to lower debt and raise revenue for the transformation. Alcatel-Lucent also provided expertise for the development and introduction of new services, equipment operation and maintenance associated with fixed and mobile networks, mobile radio planning and optimization, and management of VIVACOM’s Network Operations Center.

As a result of this outsourcing arrangement, VIVACOM was able to concentrate on protecting its core business, reduce operating expenses and grow new subscriptions by improving network quality and customer service. The relationship also enabled the development and fast deployment of new user-oriented services and solutions.

**Alcatel-Lucent**

Finally, operational excellence is not just something Alcatel-Lucent believes in for its customers — it is a concept that the company has put into practice for itself.

On the most abstract level operational excellence for us means fulfilling our promises to customers on time, on spec and at the costs agreed. It is built on optimized internal processes that allow us to efficiently execute our promises to the market. And it manifests itself in the results we deliver to customers, which demonstrate that we do what we promise.

### Conclusion

Operational excellence in a network provider framework is all about ensuring that each individual consumer and enterprise end user is satisfied and continues to be satisfied with everything a network provider has to offer — the network, the services, and the QoS — at all levels. However, addressing one area of the business alone will not create operational excellence. To achieve business objectives, increase competitiveness, and improve end user QoE network providers need a better way to manage their business at the network and operations layers.

This is best achieved by re-examining the processes that contribute to an end user’s overall experience. It requires network providers to go beyond independent efforts to improve network infrastructure, services, or customer service and adopt a more integrated strategy for delivering end-to-end QoE. This should be supported by a shift from network-centric to service-centric KPIs and KQIs that measure services and experience rather than network performance.

To achieve this paradigm shift, network operations and business operations must be viewed as an integrated whole and optimized to efficiently and effectively meet end user expectations, from the moment they sign for service, through service delivery, to upgrades, billing and right through to the web portal. Because this level of excellence touches a network provider’s entire operation it requires efforts built on four key activities:

- IT infrastructure transformation and operations
- Cost optimization
- Integration and interoperability across platforms
- Managing headcount and network OPEX

Integrating efforts in these areas will enable network providers to move from concentrating on the successful delivery of IP bits over the network to a more comprehensive, services-oriented operational excellence strategy focused on maximizing QoE for all end users.
Acronyms

ACP  application and content provider
ADSL  Asynchronous Digital Subscriber Line
ARPU  average revenue per user
BSS  business support systems
CAPEX  capital expenditures
IP  Internet Protocol
ITU  International Telecommunication Union
KPI  Key Performance Indicators
KQI  Key Quality Indicators
MMS  Multimedia Messaging Service
NOC  network operations center
OPEX  operating expenditures
OSS  operations support systems
QoE  quality of experience
QoS  quality of service
ROI  Return on Investment
SLA  service level agreement
SMS  Short Message Service
TCO  total cost of ownership

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