ENHANCING TELECOM MANAGEMENT

July 2005

White Paper

Telecom management can and should be an efficient business tool for creating, managing and evolving new consumer services and technologies. Most importantly, it helps telecom operators run their businesses profitably.

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1 Executive summary

Simply put, telecom management is what enables an operator to manage communication networks, services and customers, as well as their relationships. When it works well, it enables operators to focus on what really counts: their customers and service offerings. However, most operators' telecom management systems and processes do not perform efficiently, much less optimally.

Many operators today have a patchwork of systems and processes that make it difficult to cost-efficiently launch new services quickly, and to track and tune the performance of services once delivered. This patchwork also results in increased operational and capital expenditure, so there is an obvious need for operators to improve and evolve their telecom management environments.

This situation has arisen primarily because operators have used many different vertical solutions, completed extensive customizations and in-house development, and/or merged with other operators. A low level of process automation leads to high operational expenses. Costly customization of products and overlapping functionality of many different systems leads to high maintenance and support expenses.

The target for effective telecom management places the emphasis on end-to-end business processes and simplification. It involves:

- Work processes that are automated so new services can be quickly provisioned, monitored and charged for in real time.

- The introduction of dual layer architecture – with standard cross-industry business support systems tightly integrated with standard telecom-specific support systems – to reduce the total cost of ownership.

- Separate network domains that manage themselves, which ensures that each network domain's functionality is realized to its full potential.

By introducing efficient telecom management systems and processes, operators can expect to improve customer value and competitive differentiation by:

- Ensuring that customers experience quality and perceive the value of services delivered.

- Improving operational readiness for short time-to-market of new innovative services.

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At the same time they are fundamental to creating a lean operation by:

- Reducing operating expenditure for the different network domains.

- Ensuring support for new technology and business models, minimizing the need for changes in telecom management.

- Reducing total cost-of-ownership through consolidation to create fewer system and more generic systems.

Evolving an operator's telecom management systems and processes should be done step-by-step, while evolving the network. The best result is achieved by working with a business partner that knows end-to-end communication solutions and has substantial experience in implementing them.

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2   Existing telecom management solutions

Many operators lack a streamlined, efficient telecom management solution. They struggle with telecom management systems and processes that:

- Evolved from supporting only one service and one type of customer – telephony for the subscriber

- Involve hundreds of systems with inconsistencies in data, overlapping functionality, costly integrations and uncoordinated product releases

- Require difficult and time-consuming preparation to support new services for provisioning, assurance and charging.

Consider these two situations that could be solved with effective telecom management:

1) Service management issues

"Fred's" account is charged for a video clip download despite the connection being disrupted in the middle of the transaction. Instead of a dissatisfied customer, the operator could have had a happy client if its telecom management systems and processes enabled:

- Service provisioning support, where the user terminal is configured and verified to receive and execute specific downloads before "Fred" downloads.

- Service assurance support that monitors the quality of the download.

- Revenue management support, that provides real-time credit control of "Fred's" account to charge for the download when it is successfully completed.

2) Content management issues

Operator "Green" provides the same type of services to all its customers, regardless of access method or terminal. Operator "Green" wants to partner with the content and media partner "Purple" and sell its content. With effective telecom management systems and processes, Operator "Green" could:

- Easily adapt to efficiently handle and support provisioning, assurance and charging of the new service offerings

- Let "Purple" create new services and manage content on its own

- Measure consumption of "Purple's" content to enable accurate calculations of revenue sharing fees.

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3   Solutions for telecom and other industries

Companies in all industries, including telecom operators and telecom service providers, have three main areas of concern: customers, products and resources. Customers can be consumers and/or enterprises, as well as other operators. Products include deliverables, prices, terms of payment, distribution channels and even public relations. Resources include staff, capital, equipment and infrastructure.

A successful company in any industry has a working business strategy to manage the three areas: its customers, products and resources.

The relationship and fit between the areas are implemented with end-to-end business processes and supported with a business management solution.

Each industry, regardless of business area, has similar business management requirements for dealing with customers and products. This includes sales automation, order management, customer care, customer service level agreement management, invoicing, accounts receivable, accounts payable, general ledger and payment collection.

From a resource perspective each type of industry has unique business management characteristics and behaviors. Resources specific to the communications industry are services, nodes in the access, core and service networks. Some examples of specific resource characteristics in the communications industry are real-time mechanisms and session supervision, large numbers of events, "telecom grade" performance, and complex network dependencies.

Consequently, the overall needs for business management can be divided into:

- **Customer and product management** to support cross-industry generic needs for products and customers.

- **Resource management** to support industry-specific needs for resource management.
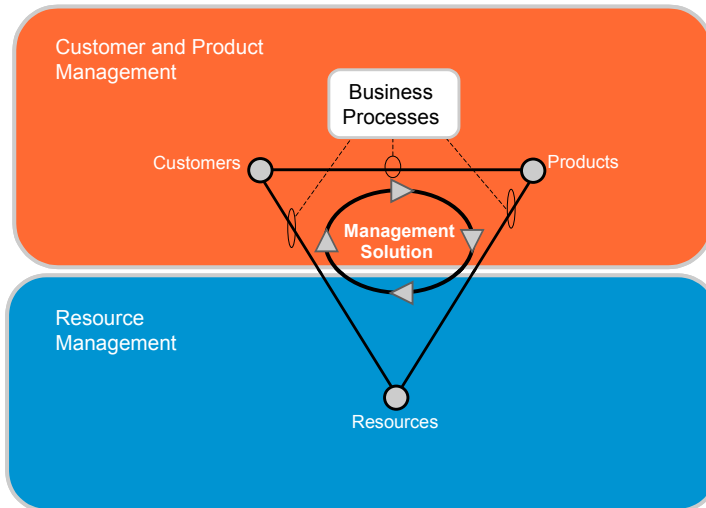
Figure 1. Management layers

3.1 Using cross-industry business support systems

Telecom operators have two primary perspectives to manage their business. One is their commercial offerings, customers and partners. The other is their infrastructure investments.

These perspectives provide the following separation of concerns:

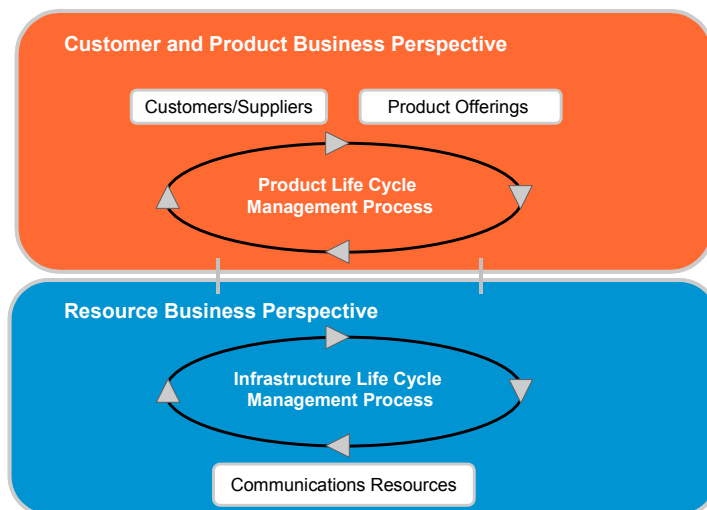- Customer and Product Business Perspective

- Resource Business Perspective

Figure 2. Management of two business perspectives

The customer and product business perspective concentrates on revenue creation: offering attractive and profitable products to focused market segments in order to attract new customers and maintain existing profitable ones. This also makes the operator attractive to third parties that can help build the end-user value chain.

Cross-industry business support solutions support the customer and product business perspective. Many telecom operators have not yet explored the full potential of such solutions. Instead, the telecom industry often relies on vertical solutions that are specific to telecom. But, as mentioned earlier, vertical solutions are one of the main factors behind the problems many operators face today.

The resource business perspective is driven by efficiency: optimizing deployed investment in infrastructure resources (capex) and operational resources (opex), optimizing service and traffic volumes delivered with controlled quality levels (customer satisfaction), and charging usage of services in the network (revenue).

Telecom industry-specific support solutions support the resource business perspective.

By closely integrating standard cross-industry business support systems with standard telecom-industry specific systems, Ericsson believes operators can efficiently support their end-to-end business processes with improved cost-of-ownership.

4 Target telecom management solutions

End-to-end business processes applied to well-defined management domains are central to telecom management. As further elaborated below, Ericsson, based on its experience with operators throughout the world, recommends a telecom management architecture be built on:

1. **End-to-end business processes** that increase automation and simplification

2. **Dual-layered implementation** based on standard cross industry business support solutions that are closely integrated with standard communication industry management solutions

3. **Simplified architecture** based on management domains that have clear roles, responsibilities and inter-dependencies, with a network domain manager as an integral part of each network domain.

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4.1   Effective end-to-end business processes

Telecom management focuses on cross-domain end-to-end business processes. This includes all processes, ranging from customer requests for service, to service activated, service disruptions to problems fixed, and customer consumptions to payments and revenue shared. Effective telecom management systems and processes allow operators to manage and operate all the phases involved in managing customers, products and resources.

To improve competitiveness, operators need to simplify and automate these processes as much as possible.

Telecom management supports end-to-end business processes such as operation and readiness, fulfillment, assurance and revenue management, as described in the eTOM[1] process model.
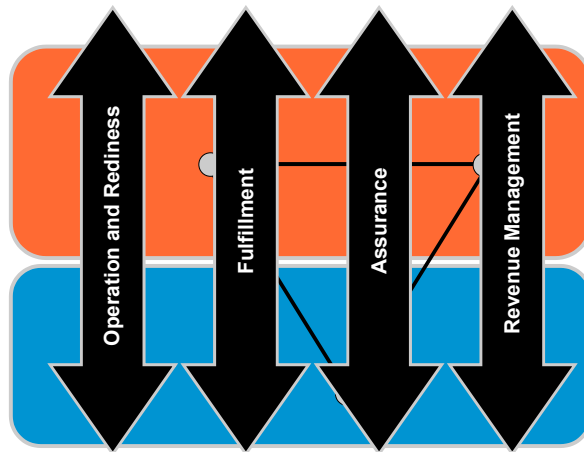

Figure 3. End-to-end process integrations

To ensure a rapid, cost-efficient launch as well as smooth management of services in operation, operators need to include telecom management when creating and introducing a new (or changed) service and/or technology into the network.

This includes ensuring that telecom management systems and processes efficiently support integrated working processes for the new service and/or technology, including:

- Fulfillment: order capture and handling, provisioning, self-service

- Assurance: delivery, service and revenue assurance

- Revenue management: online and offline interfaces for real-time charging, and charging data for rating, aggregation and revenue sharing.

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[1] Enhanced Telecom Operations Map, developed by TeleManagement Forum.

4.2 Advantages of dual-layered implementation

Operators that want to become cost-efficient have to avoid the expensive process of integrating vertical management solutions (stove pipes), and instead embrace industry-standard solutions.

Telecom management should support implementation of process integration and functionality that supports:

- Cross-industry needs for customer and product business support within a cross-industry management layer; and

- Telecom-industry-specific needs for resource business support within a communication industry specific management layer.
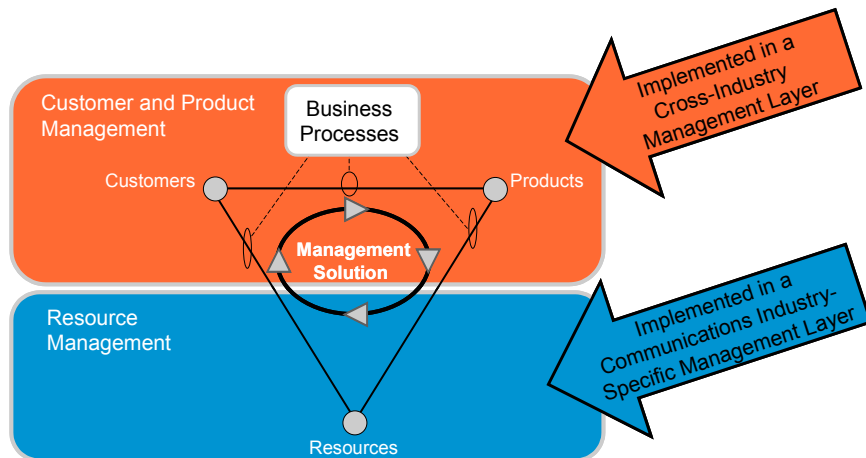

Figure 4. Dual-layered implementation

The cross-industry management layer manages generic functions, data and processes that are not specific to the communications industry. This layer handles all product offerings and business relations in the business-to-business and business-to-consumer environments.

Operators can create substantial economies of scale by increasing usage of standard cross-industry business support solutions for non-communication-industry-specific features such as customer relationship management and enterprise resources planning solutions.

The communications-industry-specific management layer manages the functions, data and processes that are related to the communications networks. In addition to increasing automation and operational efficiency for each work process, the communications-industry-specific management layer plays a key role in turning all the capabilities and features in each network domain into usable information asset for the cross-industry-management layer.

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4.3 What simplified architecture does

The simplified architecture model contains four management domains. Each one possesses well-defined functionality and responsibilities, and clearly described interfaces for cost-efficient integration.
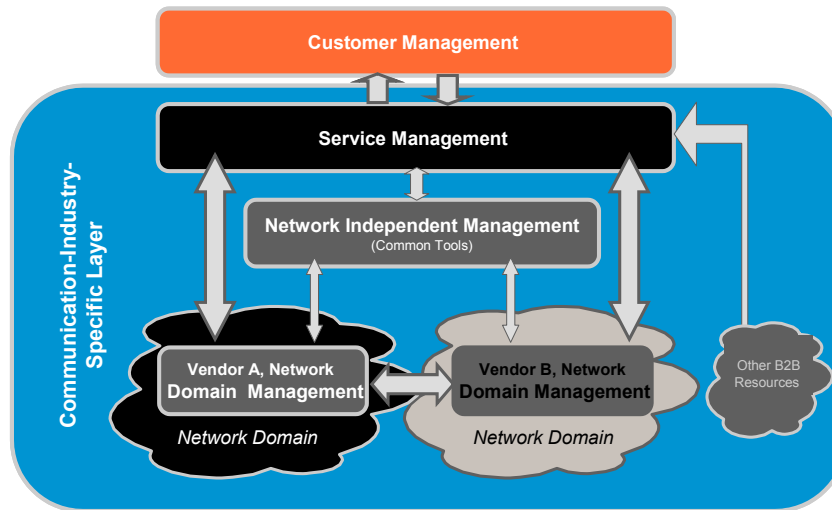

Figure 5. Telecom management domains

To simplify telecom management operators should:

- Manage cross-dependencies, and minimize overlapping information and redundant data between management domains. This will increase the inter-operability capabilities in the telecom management solution.

- Use network domain managers to strengthen management support as part of each network domain. This hides the network domain complexity from other management domains, and reduces the integration tax.

- Consolidate the current telecom management environment by reducing the number of vertical management solutions.

4.3.1 The role of customer management

The customer management domain handles all the aspects of the business management systems that operators needs to manage their customer relationships. This includes analytical, operational and collaborative customer relationship management. It also handles all financial requirements including invoicing, legal accounting and management accounting. The customer management domain provides the operator's call center staff with a full portfolio of tools to manage all customer care related tasks.

The customer management domain contains the master database for all customer information, products and orders.

4.3.2　The role of service management

Service management should provide integrated management of the communication services that support the fulfillment, assurance and revenue management process perspectives.

The domain:

- Automatically detects a service provisioning request (via the customer management domain, from the traffic flow or from the user terminal) and makes sure the correct service is provisioned according to user terminal type, user profile (age, authority and credit rating), user location and so on.

- Automatically monitors service key performance indicators that relate to service level agreements (SLA). It does this by receiving refined service data in the form of service key quality indicators from the network domain managers. SLA violation is then reported to the customer management domain.

- Automatically receives refined charging input from the network domain managers, online or offline. By using a real-time mechanism, the domain rates, allocates and reserves funds on the user's account, before granting permission to consume the service. The service usage is then aggregated before reporting to an invoicing application in the customer management domain.

4.3.3　The role of network independent management

The network independent management domain is consolidated to a number of common tools, including event correlation, reporting, inventory and network configuration management, workforce management, workflow management and trouble management. These tools support network management on multi-network domains.

Network independent management:

- Supports all other management domains with common tools and data, such as trouble tickets, reporting tools and a common data repository.

- Provides multi-network domain reporting (alarms and statistics) based on key performance indicator data from other management domains.

- Automatically uploads inventory data from the network domain managers and has the master network inventory and topology database for network configurations.

- Performs multi-network domain planning and optimization. Based on this it automatically distributes configuration work orders to the network domain managers for implementation in each specific network domain.

4.3.4 The role of network domain management

Network domain management is an integral part of each network domain. It coordinates all resources, such as infrastructure and services, in each network domain, such as access network, core network and service network domains.

The role of network domain management is to enable self-configuring, self-repairing and self-tuning in each network domain.

Network domain managers:

- Support process automation in each network domain for configuring, repairing and optimizing network domain resources.

- Automatically aggregate network domain specific information, for example resource key quality indicators, service key quality indicators and charging data, to be used by other management domains.

- Support other management domains with automatic configuration of network-domain-specific resources and services.

- Mediate charging requests and charging data to other management domains. Provide online and offline charging interfaces to the network domain resources.

- Offer an integration interface to other management domains based on IT standards to reduce the cost for integration.

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5   Enhancing solutions step-by-step

Each operator has a different strategy for meeting customer expectations and demands. Individual strategies are based on each operator's current position and wanted position in relation to current and future target customers, services offering, business models and partner relations, and supporting environments.

Ericsson recommends a step-by-step evolution for operators that wish to develop and consolidate telecom management systems and processes that support their wanted position. This is best done as the network itself evolves and should be based on the identified areas: end-to-end business processes, simplified architecture and dual-layer implementation.

5.1   The evolution

Step-by-step evolution should start with an end-to-end gap analysis. The objective is to identify and analyze heavy cost-consuming operational and business processes, as well as requirements from network infrastructures and services.

The gap analysis identifies what steps need to be taken and in what order. This is based on the suggested improvement areas, and the business cases for each of them, which are also identified by the gap analysis.
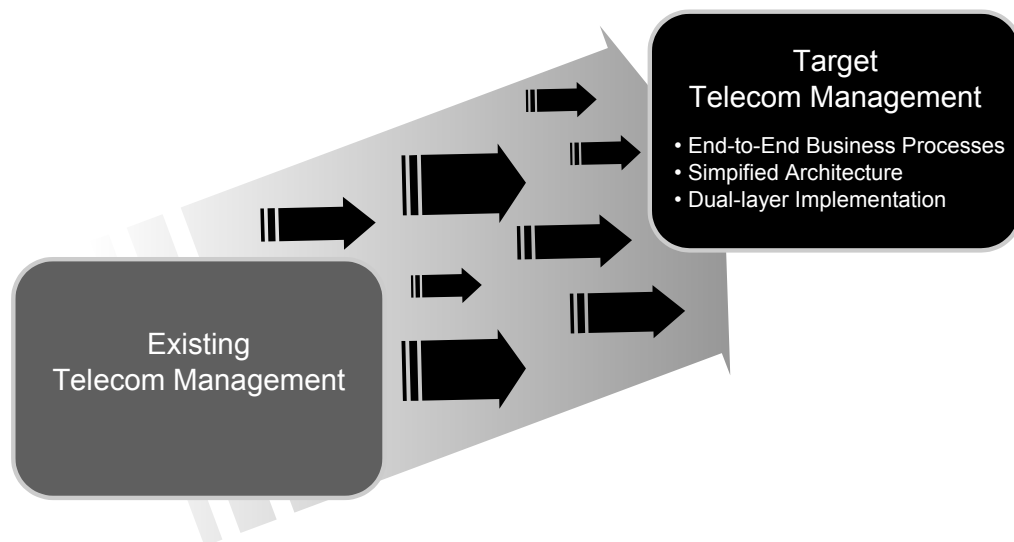

Figure 6. Step-by-step evolution of telecom management systems and processes

Examples of improvements to make in telecom management evolution are:

To improve end-to-end business process support:

- Increase the level of automation of each process, end-to-end

- Increase the level of integration in service management to support the fulfillment, assurance and revenue management process perspectives

- Gradually complement the network-centric perspective at the operations and maintenance centre with a service-centric and business-centric perspective

- Consider the business case for outsourcing support for a certain process.

The overall telecom management architecture can be simplified by:

- Strengthening the network domain managers as an integral part of each network domain

- Off-loading the common tools in the network-independent management solution from network domain dependencies

- Enabling the tools to concentrate on common functions to support all other management domains

- Consolidating current mediation gateways into a common mediation framework.

Operators can benefit from dual-layered implementation by consolidating:

- The number of management systems supporting each process, and increasing the usage of cross-industry business support systems.

- Current prepaid and postpaid billing solutions into a common charging solution tightly integrated with the customer management domain.

5.2   Ensuring a successful change process

A step-by-step evolution incorporates all aspects of change management and life cycle management, including:

Change management:

- Solutions and technology

- Business processes

- Staff and Human Resource issues

Life cycle management:

- Solution support

- Solution management

- Solution evolution

To ensure a successful change process operators should seek the assistance of an experienced partner throughout the evolution. This is particularly important when an operator is considering making a major change or improvement in their existing telecom management systems and processes.

The ideal evolution partner has experience in end-to-end communication-industry-specific solutions. It should be able to function as a systems integrator and act as a business partner. It should be able to assist operators by managing a multi-vendor and supplier environment, as well as deliver and manage solutions. The goal is to enhance, step-by-step, the operator's existing telecom management systems and processes and ensure its future success.
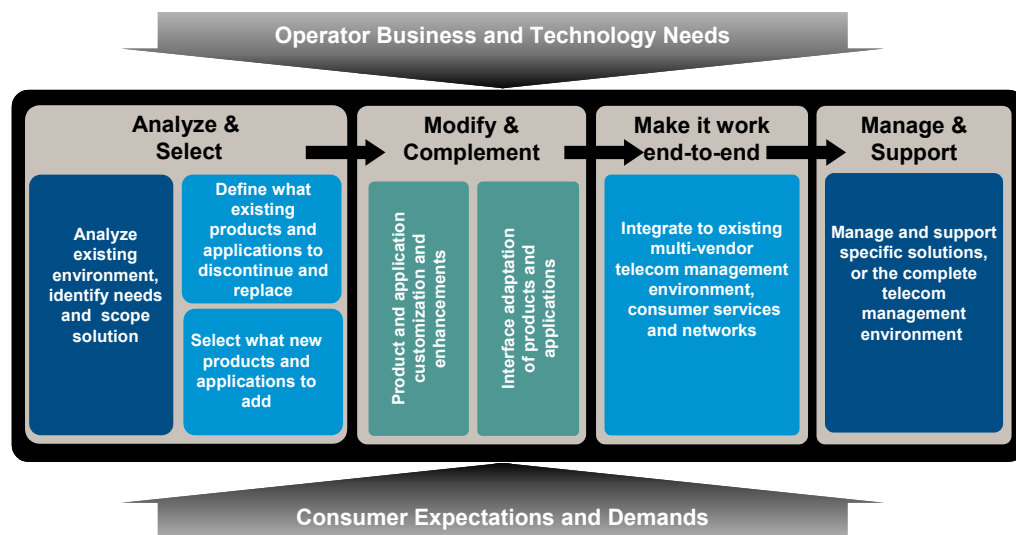

Figure 7. Ericsson's systems integration model for managing and evolving telecom management systems and processes

6 Conclusion

Operators can turn telecom management into an efficient business tool for competitive differentiation and lean operations.

Effective telecom management systems and processes enable operators to attract and retain customers, increase operational readiness for short time-to-market for new services and technologies, as well as reduce operational expenditures by, for example:

- Tracking and tuning the performance of services to ensure customers experience quality and perceive the value of the services offered.

- Automating and simplifying end-to-end processes.

- Simplifying telecom management by incorporating management capabilities within each network domain. Utilizing a network domain manager to make capabilities and features of each network domain available to all other management domains.

- Reducing their dependency on stand-alone vertical systems.

- Moving to cost-efficient, integrated telecom management based on a dual-layered architecture with clear roles, responsibilities and interfaces between management domains that can handle cross-dependencies and minimize redundant data.

Finally, operators should maximize their chance for success by taking a step-by-step approach to evolving their telecom management systems and processes, and working closely with a business partner that has a thorough knowledge of end-to-end communication solutions.