

Company profile

Nokia Siemens Networks NetAct and OSS/BSS multi-vendor capabilities

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1 Executive summary

Nokia Siemens Networks (NSN) was the fourth-largest vendor of network management systems (NMS) in 2009 with estimated NMS revenues of USD606.4 million in a total NMS market of USD4.277 billion.¹ In addition, NSN was the second largest service delivery platform (SDP) vendor in 2009, owing to its strong real-time charging platform, with estimated revenues of USD381 million of the total USD3.38 billion SDP market.² NSN is one of the largest network equipment manufacturers (NEMs), primarily in mobile with an increasing fixed portfolio, building on the combined heritage of its two parent companies – Nokia and Siemens – which merged to form NSN in 2007.

NSN's and, before its establishment, Nokia's and Siemens' NMS and OSS have traditionally been mostly proprietary, domain-specific solutions delivered as part of the vendors' own equipment deployment contracts. However, recent development efforts focused on transforming and extending NSN's NMS and OSS portfolio with more multi-vendor,³ multi-technology and service-centric management capabilities. This overall value proposition is based on aligning operators' network management functions much more closely to a customer-centric business model. More streamlined, automated processes allowing services to be rolled out and optimised more cost-effectively across multi-vendor environments are targeted by NSN's product portfolio to improve customer experience. NSN's leadership in subscriber data management confirms NSN's product portfolio progress to address customer experience management. The multi-vendor approach supports NSN's overall strategic business realignment to increase its professional services revenue, which demands multi-vendor management products and skilled resources.

NSN's telecoms software (OSS, BSS and SDP) product development approach builds on its existing product portfolio and responds to market trends – with NetAct at the core. ASPEN and TNMS are NSN products to be integrated into NetAct, which operationalizes and manages IP and transport equipment from NSN, Juniper, Tellabs and Cisco. NSN further intends to consolidate its DSL and optical network management functions into NetAct. This indicates NSN's strategic direction is to develop a common (multi-domain) NMS, in addition to its multi-vendor agenda, to help communications service providers (CSPs) rationalize their network operations. As a result, NSN's telecoms software portfolio broadly covers critical areas of network management, service assurance, service fulfilment, billing mediation and service delivery platforms (with leadership particularly in real-time charging and subscriber data management) for end-to-end service delivery and management. CSPs, as expected, identify only with the business benefits of operation and deployment cost savings from improved process efficiencies from NSN's products and product strategy.

NSN is a major global enterprise, with over 60 000 staff in more than 150 countries worldwide. The company has traditionally been a relatively minor player in North America. This looks set to change with NSN's July 2010 announced acquisition of substantially all of Motorola's mobile network equipment technology assets, business and customer relationships. This transaction will significantly increase NSN's revenues in North America, as well as create direct sales opportunities for network equipment, NMS and OSS into acquired Motorola CSPs. NSN's NMS and OSS multi-vendor operational and integration

¹ For an overall view of the network management systems market, see Analysys Mason's [NEMs network management systems market share report 2009](#).

² For an overall view of the service delivery platform market, see Analysys Mason's [Service delivery platform market share 2009](#).

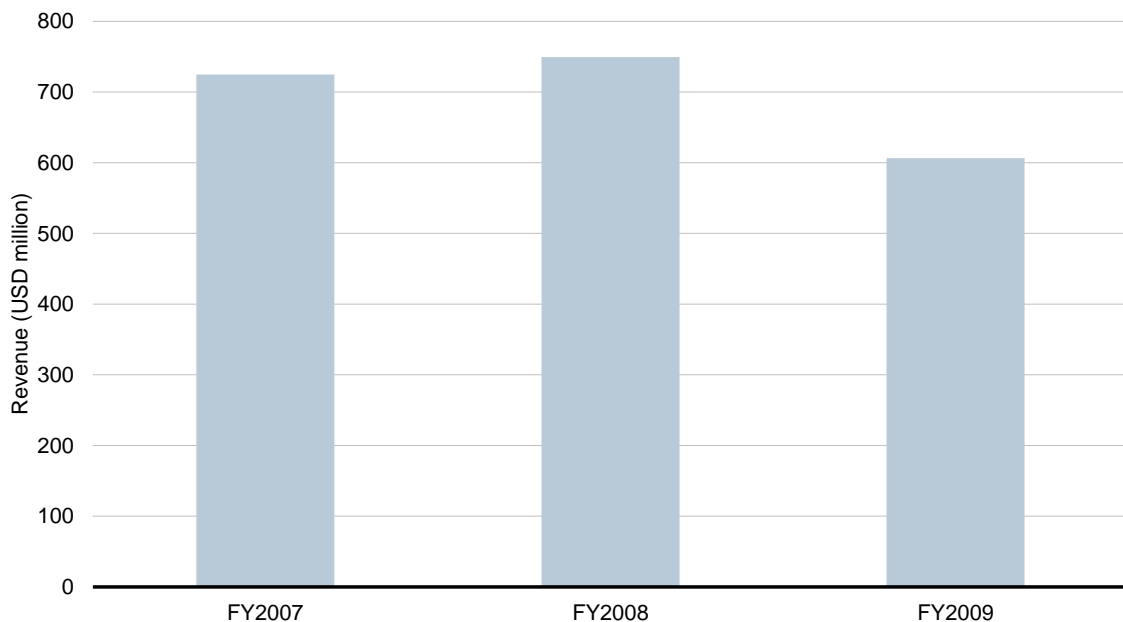
³ Multi-vendor in this report refers to the ability to adapt and integrate with other vendor hardware and software, of which this capability is available off-the-self for all standardised protocols and data format and a subset of major vendor products.

capabilities will be an asset for integrating NSN’s existing and Motorola-acquired products and technology assets.

NSN’s NMS revenue dropped by an estimated 19% in 2009. The decrease was a reflection of the recession, resulting in CSPs delaying planned investments in infrastructure upgrade and transformation projects. Another factor was NSN’s strategic decision to increase its professional services business revenue, which contributed to the lower-value product revenue. NSN’s business is approximately a 55% products-to-45% services revenue model. NSN’s NetAct provides an umbrella network management system to support its services business.

Figure 1.1 shows Analysys Mason’s estimate of NSN’s revenue from its sales of NMS and closely associated services to CSPs.

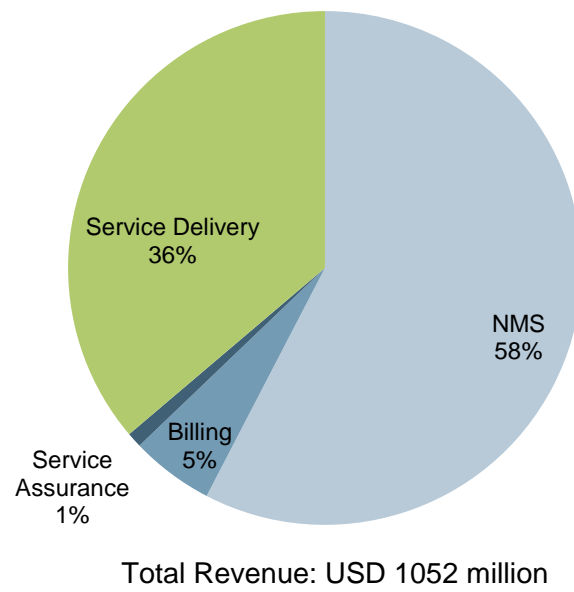
Figure 1.1: Nokia Siemens Networks’ NMS revenue, FY2007–2009 [Source: Analysys Mason, 2011]



In this profile, we focus on NSN’s core NMS product, NetAct, and NSN’s multi-vendor product offerings in other OSS and BSS areas. NSN’s strategy in the NMS and OSS market involves a focus on helping operators to realign network and service management to make them more customer-centric, and to ensure that business processes are more streamlined and automated around customer retention and value growth. This involves a tight integration between network, service and customer management to ensure that OSS and BSS can capture and process detailed customer-specific data on service usage and network performance, and that networks can be modified and optimised to improve customers’ quality of experience and enable the delivery of new revenue-generating services.

Figure 1.2 shows Analysys Mason’s estimated 2009 telecoms software revenue for NSN based on Analysys Mason’s telecoms software market segmentation (detailed in **Figure 2.4**). NMS accounted for the majority (58%) of NSN’s telecoms software revenue in 2009, with service delivery platform making up most of the remainder (36%). This also represents the diversity of NSN’s telecoms software with 5% of the revenue attributed to billing (BSS) from NSN’s charge@once mediate product.

Figure 1.2: Nokia Siemens Networks' telecoms software revenue by segment, 2009 [Source: Analysys Mason, 2011]



2 Financials and basics

Table 2.1: Nokia Siemens Networks' financials and OSS basics [Source: Analysys Mason, 2011]

Year founded	2007
Headquarters	Espoo, Finland
Company URL	http://www.nokiasiemensnetworks.com/
Stock symbol	N/a (consolidated Nokia subsidiary)
CEO	Rajeev Suri
NMS revenue 2009	About USD606.4 million (Analysys Mason estimate)
Employees	Over 60 000 (all operations, not just NMS)
Product segment(s)	Billing, NMS, service assurance, service delivery platforms
Geographic focus	Global
Primary products	NetAct suite, Open EMS Suite (OES), Serve atOnce Suite
Key partners	EMC, HP, IBM, Oracle, RADCOM, Siemens, Subex, Tektronix
Key customers	Over 600 CSPs worldwide, including 75 of the top 100 by revenue (according to NSN)

NSN generated an estimated USD1.052 billion in the telecoms software market as a whole in 2009, of which around USD606.4 million derived from NMS products and services. This made NSN the fourth-largest vendor of NMS, with a global market share of 14%.

Of NSN's total OSS revenue, around USD645.5 million (approximately 61%) was generated by products and the remaining USD407.9 million by associated professional services. NSN's business is approximately a 55% products-to-45% services revenue model. The services business is supported by NetAct as an umbrella network management system. With respect to NSN's business activities as a whole, the increasing emphasis on services is a response to several market dynamics, such as an increase in the number of CSPs seeking to outsource significant parts of their network operations, intensifying competition and pricing pressure on equipment sales, and the need to support both legacy PSTN and NGN technologies to generate new and sustain recurring revenues as phased migrations to all-IP networks are carried out.

The rapid growth and changes in technologies in telecoms have caused CSPs' operations to become complex multi-vendor environments. This has increased the demand for multi-vendor product and service capabilities, and has led to the evolution of NSN's telecoms software portfolio to focus on interoperability with third-party network elements, EMS and OSS. NSN's multi-vendor product and service proposition targets unifying and consolidating CSPs' network and service management systems to help smooth the transition to all-IP networks, enhance the ability to rapidly introduce new services, and align the network and services around a customer-centric model, while reducing opex and capex.

Figure 2.1 illustrates NSN's broad range of telecoms software products addressing network management, service assurance, service fulfilment and service delivery. In addition, NSN offers a wide range of software solutions to address specific operational issues, with a focus on complex multi-vendor, multi-technology networks and systems.

Figure 2.1: NSN's OSS portfolio [Source: Nokia Siemens Network and Analysys Mason, 2011]

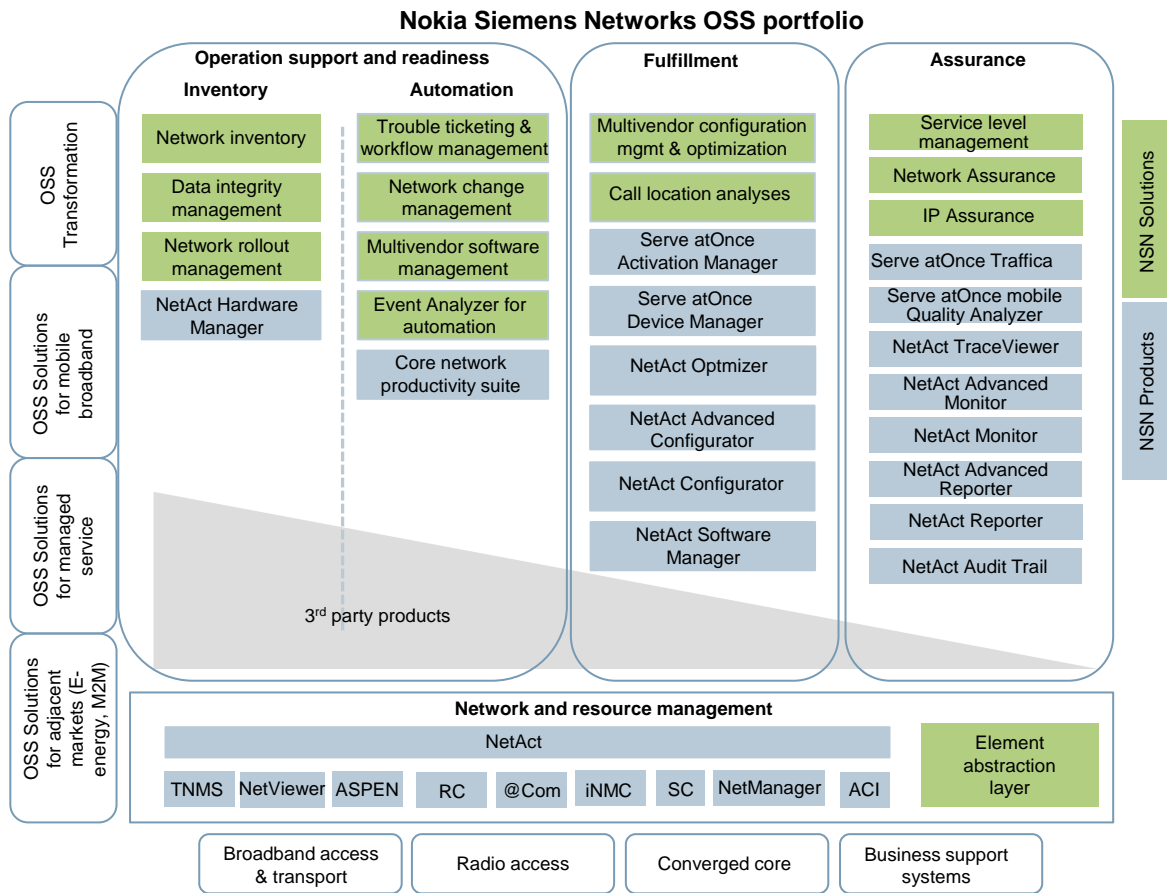


Table 2.2 below describes NSN’s OSS solutions to address CSPs’ operational pain points.

Table 2.2: Nokia Siemens Networks’ OSS solutions [Source: Analysys Mason, 2011]

Solution	Details
Network Assurance	Multi-vendor and multi-technology network-layer solution, offering a scalable platform that enables centralised fault and performance management tasks for CSPs. This solution can be delivered as a managed service either hosted or as a tailored software solution which including alarm reduction consulting, report & rule development and packages and systems integration.
IP Assurance	Centralized global view on fault and performance data from IP domain, which supports IP service monitoring. Logically part of Network Assurance and often used as building block in larger network assurance cases (such as NOC consolidation). A solution built based on third-party partner products pre-integrated with NetAct , including Advanced management components. A modular solution approach allows easy adaptation to different operation processes from assurance to fulfilment. Support for multiple use case such as mobile backhauling, and core, site and inter-site connectivity.
Service level management	Solution providing service catalog for complete service lifecycle, SLA definition and metrics. The solution includes SLA definition for customers, third parties and internal organizations, and provides SLA monitoring for contractual status and service delivery. Manages and automates contractual obligations (SLA) for all customer segments and along the service delivery chain with internal and external organizations. Helps CSPs with challenges of increasing number of service offerings and in coping with the high grade of manual work needed at present to handle SLA contracts and reporting.

Solution	Details
Multi-vendor Configuration Management. & Optimization	This includes NetAct components such as Optimizer and Advanced Configurator. This addresses the issues of optimizing multi-vendor mobile radio access networks and configuring multi-vendor network environments in complex multi-vendor CSP networks.
Call Location Analyses	A fast and cost efficient way to analyse the network performance in a geographical location. This is based on NetAct TraceViewer, NetAct Optimizer and NWS RNC collector software and related systems integration components .
Trouble ticket and workflow management	Solution for managing processes which delivers efficient and effective resolution of network resource and service problems. The resolution process refines service and resource fault and performance management data, to identify the problem and root cause.
Network Change Management	Network changes (fault corrections, new activations, re-configurations, expansions) are often performed in silos without common co-ordination resulting in un-necessary costs and service interruptions. This solution addresses this issue by tracking and managing network changes.
Multi-vendor Software Management	This solution is used for managing the end-to-end deployment process of software releases and patches, efficiently to large, complex multi-vendor, multi-technology networks. It has a centralized software inventory functionality for providing this management.
Event Analyzer for Automation	Event Analyzer (EvA) for Automation delivers defined and flexible automation analysis of procedures and pre-defined operational functions. It targets optimising automated processes.
Network Inventory	An end-to-end solution providing a central repository to model and record physical and logical networks resources, and the interdependencies between them and the services running over the network. It includes tools to support business process, such as network planning and service fulfilment.
Data Integrity management	Provides tools and repeatable processes to guarantee data accuracy and integrity ensuring operational excellence for telecommunications and network service providers. Data quality and consistency are essential within and between OSS and BSS about the "as is" state of the network and services to guarantee correct service provisioning, design and activation, to support customer care, and to maximise the efficiency in capacity and network planning.
Network Rollout Management	Integrated network planning, rollout management and inventory solution enables CSPs to manage the design, upgrade/rollout of their radio access networks providing ROI and time to live metrics.

Table 2.3 below describes NSN’s principal EMS, NMS and OSS products which are used to deliver the OSS solutions identified in **Table 2.2**.

Table 2.3: Nokia Siemens Networks' NMS and OSS products [Source: Analysys Mason, 2011]

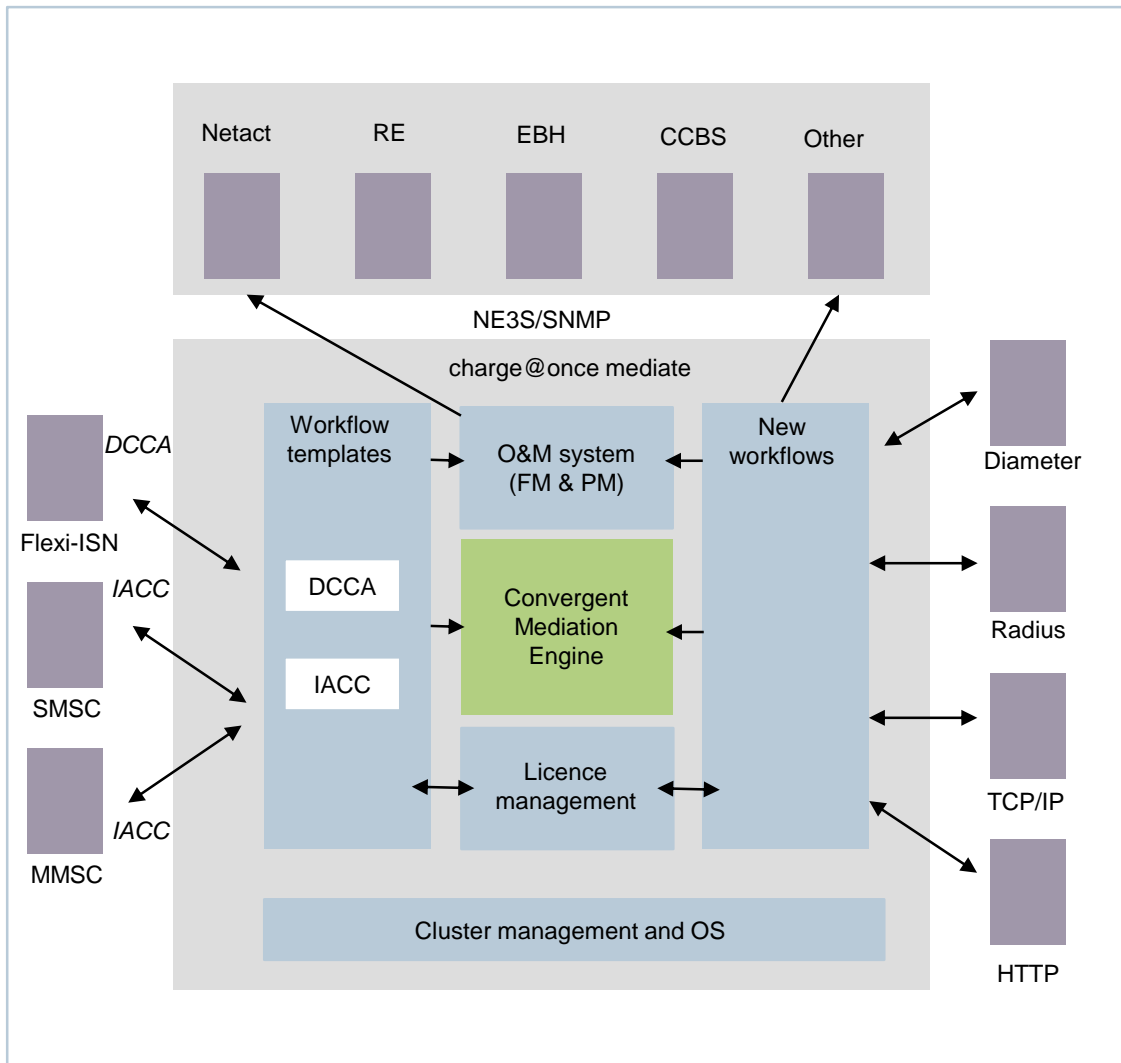
Product	Details
NetAct Network Management System	<p>NetAct is NSN's principal NMS product and the foundation of its OSS portfolio. It comprises a suite of modular software and systems for the management of both NSN and third-party elements and systems. It continues to evolve to be an NMS for monitoring, measuring and configuring the network and services in multi-vendor, multi-technology environments. NetAct software modules include:</p> <ul style="list-style-type: none"> • NetAct Advanced Monitor: a service assurance system that collects and analyses data from fault, performance and traffic monitoring systems and other data sources; correlates it with inventory systems, and provides drill-down capabilities for troubleshooting along with automated fault resolution and alarm management. • NetAct Advanced Reporter: a network management reporting system, containing user-friendly tools for producing, scheduling, customising and viewing reports, and an IBM COGNOS 8.4-based dashboard. • NetAct Configurator: a multi-vendor radio network configuration management software product, including tools for collecting, verifying, correcting, documenting and visualising network configuration data. This has several modules: <i>NetAct Configurator for Radio</i>, <i>NetAct Configurator for Core</i> and <i>NetAct Advanced Configurator</i> (provides multi-vendor configuration capability). NSN intends to extend this product to manage transport network. • NetAct for Core, NetAct for Radio and NetAct for Transport: these NetAct modules are designed to provide end-to-end, multi-vendor, multi-layer element and network management, covering most core, radio and transport network technologies. They are intended to support convergent management of all voice/data and fixed/mobile services, improve process automation, provide more effective provisioning and improve error analysis. These NetAct products are built on the same modular architecture used for the Open EMS Suite (see below), designed to reduce integration costs and share data between different systems. • NetAct Global Reporter: a centralised data warehouse and reporting product designed to collect, store and analyse network and service-related performance, usage and quality data. • NetAct Monitor: a multi-vendor, multi-technology alarm monitoring system containing root-cause analysis capabilities for fault resolution. • NetAct Optimizer: an automated tool for optimising and visualising radio network quality and performance. It provides automated, measurement based optimisation of GSM, WCDMA and LTE networks for mobile vendors. Optimizer already supports the main mobile vendors of Ericsson 2G/3G, Huawei 2G/3G and all NSN. Motorola, Alcatel-Lucent and ZTE networks can be handled on an as needed basis. In multi-vendor network cases Optimizer retrieves the data from other vendor OSS system or the preferred tools used by the CSP. • NetAct Service Quality Manager (SQM): a service-monitoring tool which allows monitoring from the customer's perspective and automates the troubleshooting process. It correlates various data sources to assess the status and quality of defined services. It also evaluates the service impact of network faults and provides root cause information for detected service problems. • NetAct TraceViewer: provides a centralized subscriber and equipment trace for 2G, 3G and PaCo/GPRS technologies for analysing customer complaints and troubleshooting, checking radio coverage, analysing service availability, detecting dropped calls and malfunctioning mobile terminals, and measuring speed of 2G/3G against service level agreement metrics.
AccessIntegrator Ethernet (ACI-E)	<p>ACI-E is an element management system for NSN's wireline access networks. It provides full ITU-T FCAPS (fault, configuration, accounting, performance and security) management functionality for all NSN fixed access network technologies including Carrier Ethernet, DSL (IP DSLAM, MSAN), IP (switches), optical (GPON) and CPEs.</p>
ASPEN	<p>ASPEN (Advanced Service Management Platform for Carrier Ethernet Networks) is designed to manage all A-series and NSN-Juniper Carrier Ethernet Transport network elements to deliver the most reliable, scalable and cost-effective Carrier Ethernet transport. ASPEN manages Juniper MX equipment and will become integrated with the next NetAct, for Transport, NMS version.</p>
NetManager	<p>NetManager provides element and domain management for Nokia Siemens Networks Perfect Voice, VoIP and broadband access products. It provides integrated fault clearance support using an alarm topology map that includes all the network elements from the Perfect Voice and CBVoIP Product range.</p>
NetViewer NME Suite	<p>NetViewer NME Suite is a collection of products for network management including an Element Manager and a number of Local Craft Terminals. It is designed to support Microwave (SDH, PDH and Ethernet) networks as well as WiMAX 802.16d fixed and nomadic products, and NBA nodes.</p>

Product	Details
NMS/10	NMS/10 is a PC-based multi-user network manager for network monitoring, configuration and data collection in small fixed and mobile transmission networks. It is designed to provide full-scale fault management support for the entire transmission network, including alarm forwarding remote operations.
Node Manager Server	Node Manager Server is an OSS enabling remote and centralised configuration changes, troubleshooting and upgrades for node managers.
Open EMS Suite (OES)	OES is an umbrella software platform designed to support network element adaptation and integration for multi-vendor and multi-technology network management systems. It includes a Managed Object Framework (MOF) that provides XML metadata-driven topology and configuration management services to enable adaptation to different types of networks. The product is designed to provide comprehensive out-of-the-box fault and performance management capabilities adaptable to any NMS, and out-of-the-box adaptors to minimise integration between EMS/NMS and OSS.
Serve atOnce Activation Manager	Serve atOnce Activation Manager (SAAM) is a centralized provisioning system for service and subscriber provisioning. It supports multi-technology networks such as 2G, 3G, packet core, broadband, IMS, PoC and VoIP. SAAM is multi-vendor, supporting all NSN products and solutions and some other third-party products and solutions.
Serve atOnce Device Manager	Serve atOnce Device Manager (SADM) is a mobile device management system, reaching and managing user devices remotely. SADM provides automated device detection and configuration, as well as advanced device management such as application management, security functions, backup and restore, and inventory. It provides customer care troubleshooting tools and options for rectifying end users' device specific problems. SADM also provides specific customer device insights to improve business decisions.
Serve atOnce Mobile Quality Analyzer	Serve atOnce Mobile Quality Analyzer (MQA) collects data directly from subscriber's device (with the agreement of the end user) to analyse customer behaviour, service and network quality. It provides a tool for network quality benchmarking, using network specific parameters collected from end users' devices.
Serve atOnce Process Automation Enabling Suite	Serve atOnce Process automation enabling suite is an SOA based framework to integrate northbound OSS like Activation System, Device Management and Inventory Management System. It provides standard northbound interfaces to such service fulfilment OSS.
Serve atOnce Traffica	Serve atOnce Traffica is a service quality management and network performance monitoring system that collects detailed usage data from network elements in real time. This data is available to northbound NSN, third-party or custom OSS and BSS for the purposes of customer, fault, performance and service management.
Telecommunications Network Management System (TNMS)	TNMS is an end-to-end NMS for optical transport networks, supporting DWDM, Ethernet, PDH and SDH services. It carries out all common management functions (FCAPS) in the element, network and service layer via a single user-friendly GUI. It will become integrated into the NetAct Transport next-generation management application.

In addition to its multi-vendor OSS products, NSN also has multi-vendor BSS charge@once products. NSN's billing market share is in the mediation sub-segment from its multi-vendor charge@once mediate product.

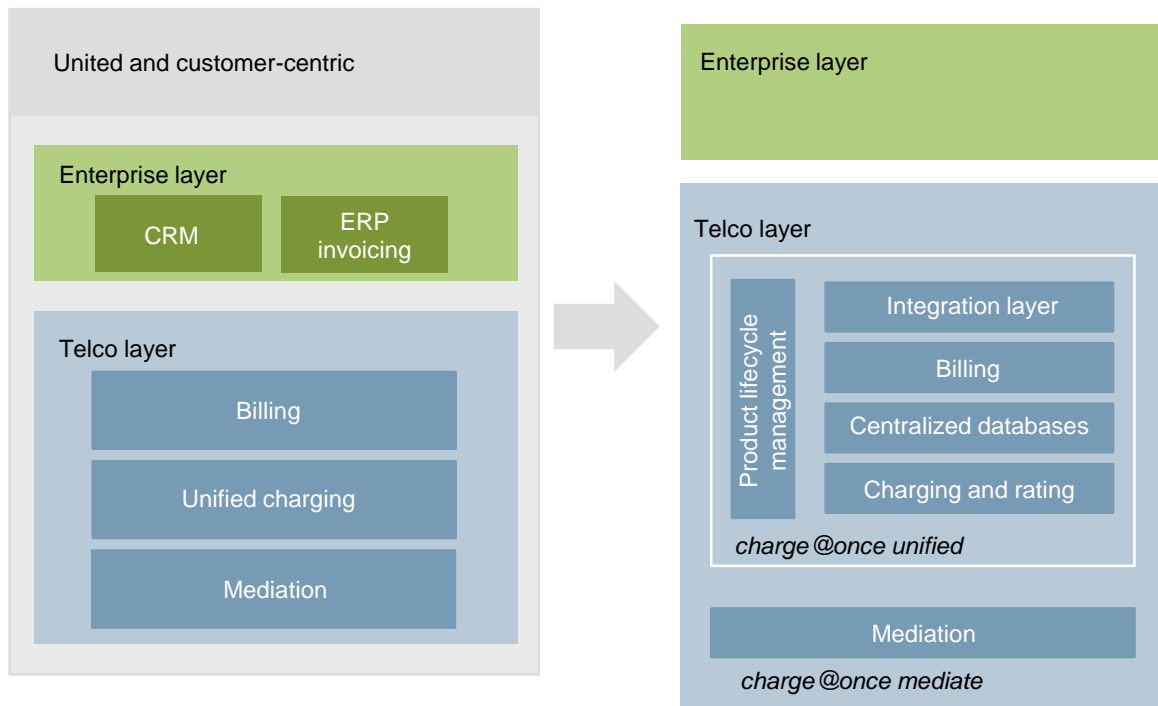
charge@once mediate provides online and offline mediation and can work with charge@once select or a third-party online charging system. Its tools and graphical user interface can be used to implement the processing rules for online and/or offline charging logic. charge@once mediate enables the creation of an adaptation layer between the network element and an online charging system (OCS). It supports all commonly used interfaces for online credit control, such as the 3GPP compliant Diameter Credit Control Application (DCCA) interface, Radius, HTTP, TCP/IP and In-Advance Credit Check (IACC) interface.

Figure 2.2: charge@once mediate example of active mediation [Source: Nokia Siemens Networks and Analysys Mason, 2011]



charge@once unified is the next generation of NSN’s convergent multi-vendor billing and charging solutions. It offers convergent rating and charging of content, events and sessions in circuit- and packet-switched networks, independent of the payment method. charge@once mediate supports charge@once unified integration to other network elements to collect network usage records to be rated. charge@once unified covers the telecommunications layer and provides access functions for integration with enterprise-layer systems such as CRM and ERP, as illustrated in **Figure 2.3** below.

Figure 2.3: charge@once unified functional overview [Source: Nokia Siemens Networks and Analysys Mason, 2011]



NSN’s development efforts in the NMS and OSS areas have focused on four main objectives: multi-vendor / multi-technology capability; process automation; service quality management and standardisation. In the NMS area, the focus is on umbrella network and service management with open-standards, metadata-driven and service-orientated common data models and integration frameworks. This provides a roadmap for consolidated, end-to-end management of multi-vendor, multi-domain network elements, technologies and services. NSN’s key product offerings that illustrate this approach are described in **Table 2.3** above.

The experience and knowledge gained from developing and implementing the OES has led to NSN organically developing an element abstraction layer (EAL) i.e. a flexible, standards-based, middleware layer that can pass NMS/EMS data with business-process logic to northbound OSS. This provides a potential means for less proprietary software in northbound interfaces. The EAL is a fundamental building block towards the realisation of NSN’s ambition to create a more streamlined, standardized and automated OSS architecture where network management is directly and flexibly aligned with business processes and objectives around customer, product development and service management. These developments also underpin NSN’s concept of self-organising networks (SON), which include built-in, multi-vendor intelligence and management capabilities enabling the networks to automatically optimize, configure and ‘heal’ themselves.

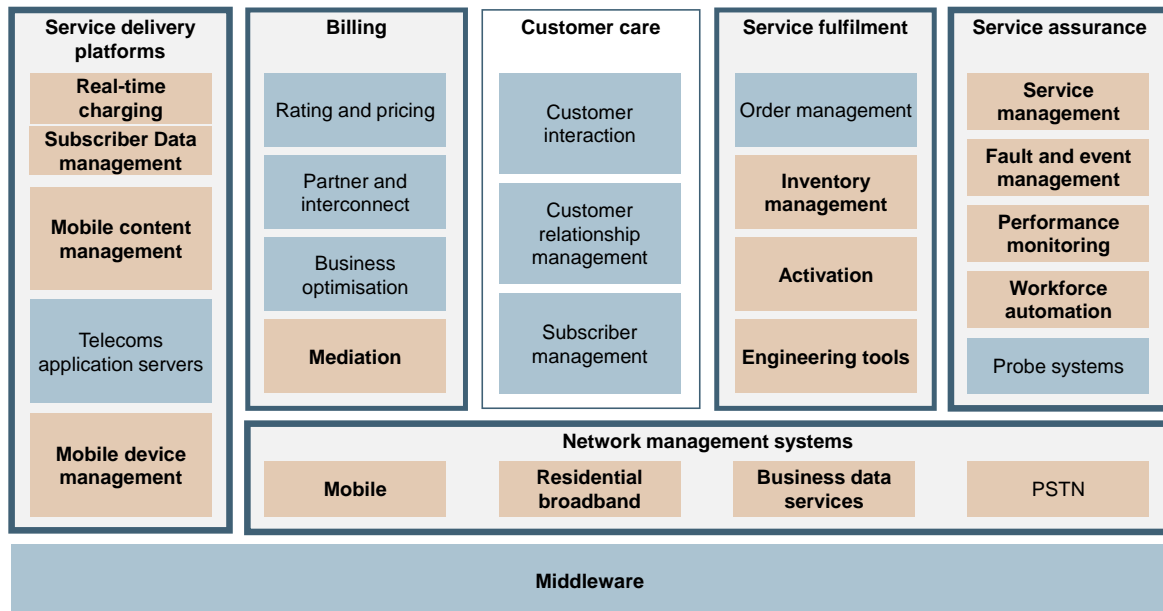
In keeping with this strategy, NSN advocates broader industry adoption of the TeleManagement Forum’s Information Framework (SID) – a common information reference model to enable data sharing across multi-vendor environments. In May 2010, NSN reported that some of its key OSS and BSS had been awarded SID certification, including ‘NetAct 6.0’ (latest version), charge@once products, and the Serve AtOnce suite.

Other recent innovations illustrating NSN’s focus on consolidated network and operations management include ‘NetAct for Transport’. This extends NetAct to end-to-end management of IP-based transport,

including IP/MPLS, carrier Ethernet, microwave, optical and access networks. This was announced at the Broadband World Forum held in Paris (October 2010) to support NSN’s various transport managed services offerings (Transport as a service (TaaS)). Previously in September 2009, NSN introduced the ‘Advanced Performance Check’ solution – a systematic, proactive, automated solution for multi-domain performance management.

Analysys Mason identifies functional categories of telecoms software investment in the telecoms market. **Figure 2.4** below illustrates the full set of these categories and the way they are grouped into segments. Analysys Mason yearly publishes the market share and five-year forecast for each of the segments (as well as consolidated market share information). NSN’s OSS and BSS portfolio reported here are highlighted on **Figure 2.4** below. In this illustration, ‘Rating and pricing’ relates to postpaid services, whilst NSN’s strength is in the prepaid segment, which is covered by the ‘Real-time charging’ segment.

Figure 2.4: Nokia Siemens Networks’ telecoms software products portfolio positioning in Analysys Mason’s telecoms software market segmentation [Source: Analysys Mason, 2011]



3 Customers and markets

NSN has over 600 CSP customers worldwide, including – according to the vendor – 75 out of the world’s 100 largest CSPs. With such a diverse customer base, including all sizes and types of networks, it would be invidious to single out just a handful of key customers. **Table 3.1** presents a few salient instances of where NSN has carried out projects involving a significant NMS or OSS component. Section 3.1 provides additional relevant customer case studies.

Table 3.1: Significant Nokia Siemens Networks NMS/OSS customers [Source: Analysys Mason, 2011]

Customer	Product type
Elisa	NetAct network management system configured, optimized and monitored Elisa’s deployment extending 3G into rural Finland and upgrading its mobile broadband to HSPA+, as well as continues to perform network management to help Elisa deliver high-quality services over its multi-vendor, multi-technology mobile networks.
Hutchison Telecom Indonesia	Multi-vendor Service Delivery Framework (SDF), helped enable new mobile network roll-out and launch in nine months in 2006/7.
KPN	Use of Event Analyzer for Automation (EvA) to reduce network alarms, automate routine maintenance tasks, shorten fault resolution times and cut costs.
Smart Communications (Philippines)	Use of NetAct Optimizer to automatically tune GSM network frequencies in major cities to improve performance.
Orange (Slovensko)	Use of Serve atOnce Traffica to improve customer experience through proactive maintenance, right level of service quality for understanding customer behaviour for a relevant service portfolio.
Telenor	NetAct Global Reporter provides flexible reporting to improve quality of service on its multi-vendor, cross-border (regional) network.
Telenor Pakistan	Use of NetAct and Serve atOnce Traffica solutions to improve quality of customer experience and shorten fault resolution times.
T-Mobile USA	This is the largest and only version (heavily customised) of NetAct Global Reporter worldwide, which provides T-Mobile USA with a national level view of its multi-vendor, multi-technology network comprising over 50 vendors’ equipment. This implementation of NetAct Global Reporter provides highly scalable, real-time and flexible performance management and reporting capabilities for T-Mobile USA.
VimpelCom	Use of Serve atOnce Traffica to improve quality-of-service monitoring and reduce opex.
Vodafone D2	Use of NetAct 6.0 Monitor multi-vendor and multi-technology capabilities to manage complexity in the networks, which simplifies network alarm handling to increase network operational efficiencies and consequently meet Vodafone D2’s objective to be more competitive.
Zain Kuwait	Use of charge@once prepaid charging solution to cut times to launch new services and targeted promotions.

As stated previously, NSN has adopted an overall strategy of generating around 55% of its revenue from products (both hardware and software) and 45% from services. NSN’s OSS delivery has typically arisen as part of a packaged deal comprising both products and services, in three main variations:

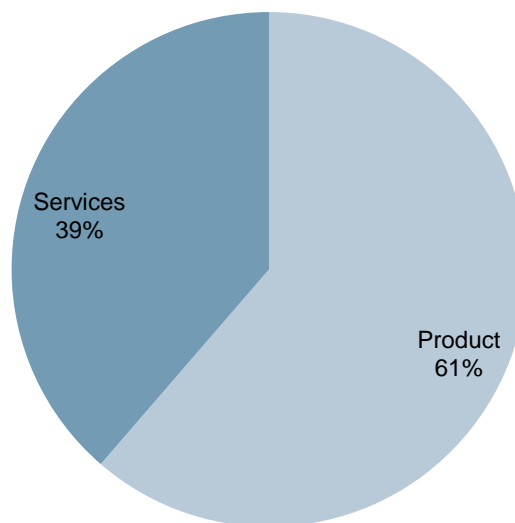
- NMS and OSS are delivered as part of projects to deploy new NSN network equipment and infrastructure, which are integral to the overall solution: for instance the NetAct NMS and performance management modules have frequently been provided as part of 2G and 3G mobile network roll-outs.

- NMS and OSS are delivered as standalone products or solutions, or as part of a managed OSS service, provided in response to particular operational needs or pressure points from the CSP (usually, but not always, an existing NSN customer), such as the requirement to consolidate network management for multi-vendor mobile networks, or the goal of improving quality of service and reducing opex.
- NMS and OSS are provided as part of managed services contracts in which operators outsource significant parts or all of their network operations to NSN, which typically includes elements of OSS and network transformation responsibilities.

As part of the refocusing of its strategy around services, NSN is placing an increasing emphasis on the latter two delivery modes, which is what leads to such a premium being placed on multi-vendor and service awareness capabilities of its OSS products portfolio and professional services personnel. In addition, the more NSN products are adapted to the multi-vendor, multi-technology environment, the greater the potential opportunities to leverage cross-selling NSN products into services contracts with non-NSN environments.

Figure 3.1 shows the split of product and services revenue across NSN's whole telecoms software portfolio in 2009. At 61% products and 39% services, the ratio is close to the optimum split targeted by NSN.

Figure 3.1: NSN's total telecoms software revenue by product and services, 2009 [Source: Analysys Mason, 2011]



About 78% of NSN's NMS-specific revenue in 2009 is attributed to mobile. This is a reflection of the historical and continuing strength of NSN's in mobile-network infrastructure and supporting software systems. Business services represent a key strategic growth area and are an important factor in NSN's overall emphasis on end-to-end network monitoring and quality-of-service management. **Figure 3.2** and **Figure 3.3** illustrate the similarity of NSN's NMS and OSS revenue split being skewed to their strength in mobile and NetAct's origin – a mobile NMS. This further demonstrates NSN's strategic direction to make NetAct the pillar of its OSS suite.

Figure 3.2: Nokia Siemens Networks' NMS revenue by service segment, 2009 [Source: Analysys Mason, 2011]

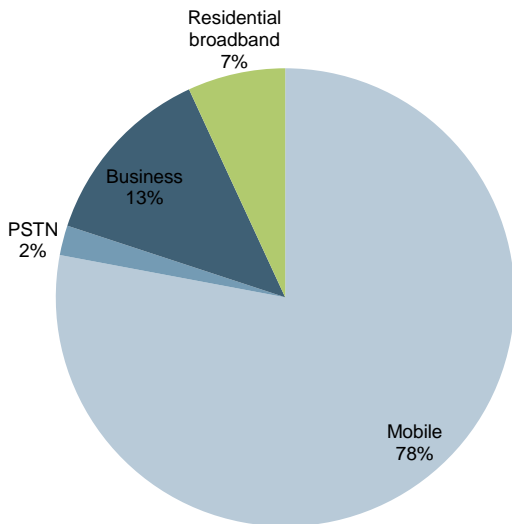
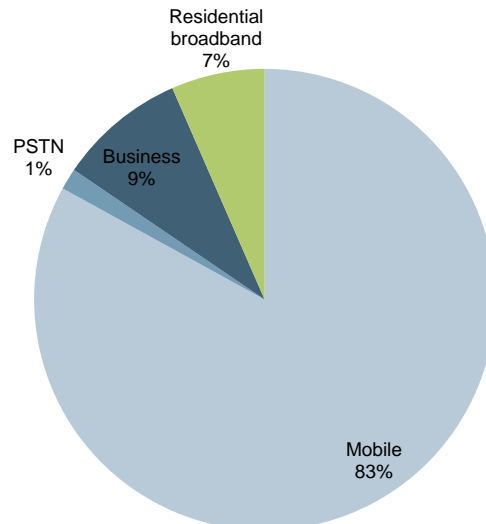


Figure 3.3: Nokia Siemens Networks' OSS revenue by service segment, 2009 [Source: Analysys Mason, 2011]



NSN's revenue was derived almost exclusively from EMEA and APAC in 2009. The vendor has long-established relationships with major CSPs in both regions, where it has been involved in numerous mobile, core and access network equipment deployment projects. By contrast, and for similar historical reasons, NSN has comparatively little business in North America, an issue which NSN's acquisition of Motorola is targeted to address. **Figure 3.4** and **Figure 3.5** illustrate the similarity of NSN's NMS and total OSS regional split which aligns with its managed services to existing customers using NetAct as an umbrella NMS/OSS suite to support operations, unless indicated otherwise by the customer.

Figure 3.4: Nokia Siemens Networks' NMS revenue by region, 2009 [Source: Analysys Mason, 2011]

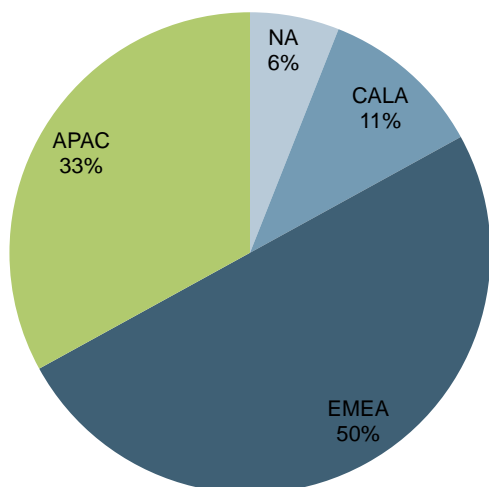
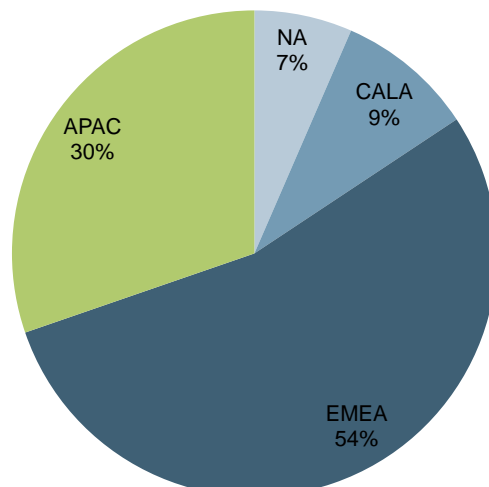


Figure 3.5: Nokia Siemens Networks' OSS revenue by region, 2009 [Source: Analysys Mason, 2011]



NSN has done limited acquisitions specific to NMS. The acquisition of technology assets from third parties appears to be a less important compared with the geographical reach of customers and skilled multi-vendor resources attained from these transactions. This supports NSN's strategy to expand its global professional services business. A summary of NSN's acquisitions/investments is listed in **Table 3.2**.

Table 3.2: Nokia Siemens Networks' M&A in the OSS segment [Source: Analysys Mason, 2011]

Date	Acquisition/investments	Transaction value (USD million)
2010	IRIS Telecom	N/a
2010	OpenCloud (investment)	6
2010	Motorola (Networks Unit)	1200
2008	Apertio	206
2007	Atrica	N/a

N/a: data not available

3.1 Customer cases studies

China Unicom, Shanghai

China Unicom has been publicly listed since 2000 (NASDAQ: CHU) and has merged with former China Netcom (completed 6 January 2009). It has businesses in 31 provinces (autonomous regions and municipalities) across China and many countries and regions around the world. Its business located in Shanghai is known as Shanghai Unicom. It is one of the top-three mobile CSPs in China and has GSM, including 3G, and WCDMA networks that provide a wide range of mobile services to its subscribers. The network comprises NSN and Huawei equipment.

Challenge

Shanghai Unicom needed to improve its mobile customers' experience by ensuring the network propagation is always optimal. The challenge was end-to-end network optimization, having both NSN and Huawei equipment as well as two different radio technologies (GSM and WCDMA).

The NetAct Optimizer solution

'NetAct Optimizer' was selected because of its industry recognition and widespread use for multi-vendor mobile network optimization. Shanghai Unicom already used NetAct for fault management, configuration management, provisioning and reporting, and Serve atOnce Traffica for service quality management and network performance monitoring for the management of the NSN network. NetAct Optimizer would provide an end-to-end optimization solution for the NSN and Huawei network.

Because there was no other optimization tool in the network, the implementation of NetAct Optimizer was straightforward. NetAct Optimizer was integrated into Huawei's M2000 (mobile NMS) to receive input data in order to perform network optimization calculation. This solution allowed network optimization to be automated on the NSN network, but the optimization changes to the Huawei network needed to be configured manually or through Huawei's M2000.

Benefits achieved

NetAct Optimizer gave Shanghai Unicom a single end-to-end tool which removed ‘swivel chair’ operation for network optimization – improving operational efficiency. The ability to carry out end-to-end network optimization for both the NSN and Huawei networks improved the following network KPIs:

- call drop rate decreased by 10%–20%
- busy-hour uplink quality improved from 85.7% to 88.4%
- busy-hour downlink quality improved from 75.5% to 82.2%.

These improved KPIs enhanced the quality of service, which in turn contributed to a better customer experience on Shanghai Unicom’s network.

Shanghai Unicom’s new challenge, for which it will consider NetAct, is multi-vendor configuration management (possibly ‘NetAct Advanced Configurator’) and performance management.

4 Analysis

NSN is one of the few major NEMs that continues to dominate mobile NMS and equipment markets. While other NEMs have concentrated on single-vendor, multi-domain, multi-technology NMS, NSN stands out as the only NEM to aggressively pursue the challenging multi-vendor route for NetAct.

4.1 Strengths

Most CSPs, especially Tier-1 and incumbents, operate multi-vendor networks. The management of these heterogeneous networks leads to operational inefficiencies which reduce the CSPs' margins. NSN targets resolving this multi-vendor challenge with providing CSPs with a NetAct 'suite' that has a multitude of modular multi-vendor management components CSPs can select to meet their tailored requirements. As a result, smaller or greenfield CSPs could implement cost-effective OSS functions from NetAct modules.

NetAct started as a mobile NMS only, and is still very strong in the mobile NMS segment. However now, NetAct also addresses network management in the growing business services and residential broadband NMS segments. NetAct still has legacy network management capability for circuit-switched (PSTN) equipment which is largely in maintenance mode at present. ASPEN and TNMS are expected to become integrated into NetAct, which operationalizes and manages multiple vendors' IP equipment from NSN, Juniper, Tellabs and Cisco. NSN further intends to consolidate its DSL and optical network management functions into NetAct. This indicates NSN's strategic direction is to develop a common (multi-domain) NMS, in addition to its multi-vendor agenda, to help CSPs rationalize its network operations.

NSN NetAct's multi-vendor capabilities also strategically supports NSN's strong professional services by being able to manage multi-vendor CSP networks and operations environment from their global NOCs using NetAct as an umbrella multi-vendor network management solution. Additionally, NetAct as a multi-vendor NMS solution can help CSPs reduce challenges of introducing new supplier equipment into the network. Furthermore, NSN's strong partner programme with all the main OSS and BSS vendors ensures all NSN telecoms software products can be integrated if and when needed, based on CSP requirements.

NSN's telecoms software (OSS, BSS and SDP) product development approach builds on its existing product portfolio and responds to market trends – with NetAct at the core. As a result, NSN telecoms software portfolio broadly covers critical areas of network management, service assurance, service fulfilment, billing mediation and service delivery platforms (with leadership particularly in real-time charging and subscriber data management) for end-to-end service delivery and management.

4.2 Weaknesses

Whilst NetAct's modular structure provides the flexibility to customize a management solution with lesser integration effort, it is difficult to readily identify in which component specific capabilities/functions reside. This is an issue which evolved from NetAct's legacy and organic development, as with most software development. All NetAct software modules are dependent on the base NetAct NMS to work.

NSN NetAct is currently the only NMS that provides multi-vendor capabilities. However high customization is required for some multi-vendor implementation for vendors that are not pre-tested. This customization process can result in cost and time overheads.

4.3 Threats

Alcatel-Lucent 5620 SAM and Huawei's U2000 are moving to a clearer multi-domain NMS which provides NMS feature only and does not include other OSS functions such as service assurance and/or service fulfilment. Also, displacing established multi-vendor independent software vendors (ISVs) such as Amdocs, Oracle, IBM and HP in the service fulfilment and service assurance market will be difficult for NSN.

Management and maintenance of multi-vendor products are very complex because of the high number of customized implementations that need to be individually tracked (versioned). Each customization may not be reusable or incorporated into NSN's mainstream product development, leading to possibly unrecoverable cost (time and resources). Other NEMs have stayed away from multi-vendor NMS because of the cost, complexity and limited market demand.

4.4 Opportunities

The high and growing number of multi-vendor networks does present opportunities for NSN's NetAct. NSN has also been very successful in emerging markets with small and new entrant CSPs providing it with most of the baseline OSS, billing and SDP needed to operate effectively. The multi-vendor NMS proposition is a unique selling proposition in the industry.

NSN's managed services business exposure to multi-vendor environment enhances NSN's systems integration skills of NSN products and third-party products. These multi-vendor skills assist with driving NSN's multi-vendor product roadmap. An example of this is NSN's multi-vendor PCRF solution (PCS-5000) that integrates with third-party products to provide policy management for CSPs and is part of NSN's IMS core offering.

NSN's modular approach of NetAct allows for retention of the value of various software component capabilities. Typically, NEMs bundle many functions into their NMS, which is commonly given away with equipment sales since the NMS is usually needed to effectively operationalize the equipment.

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