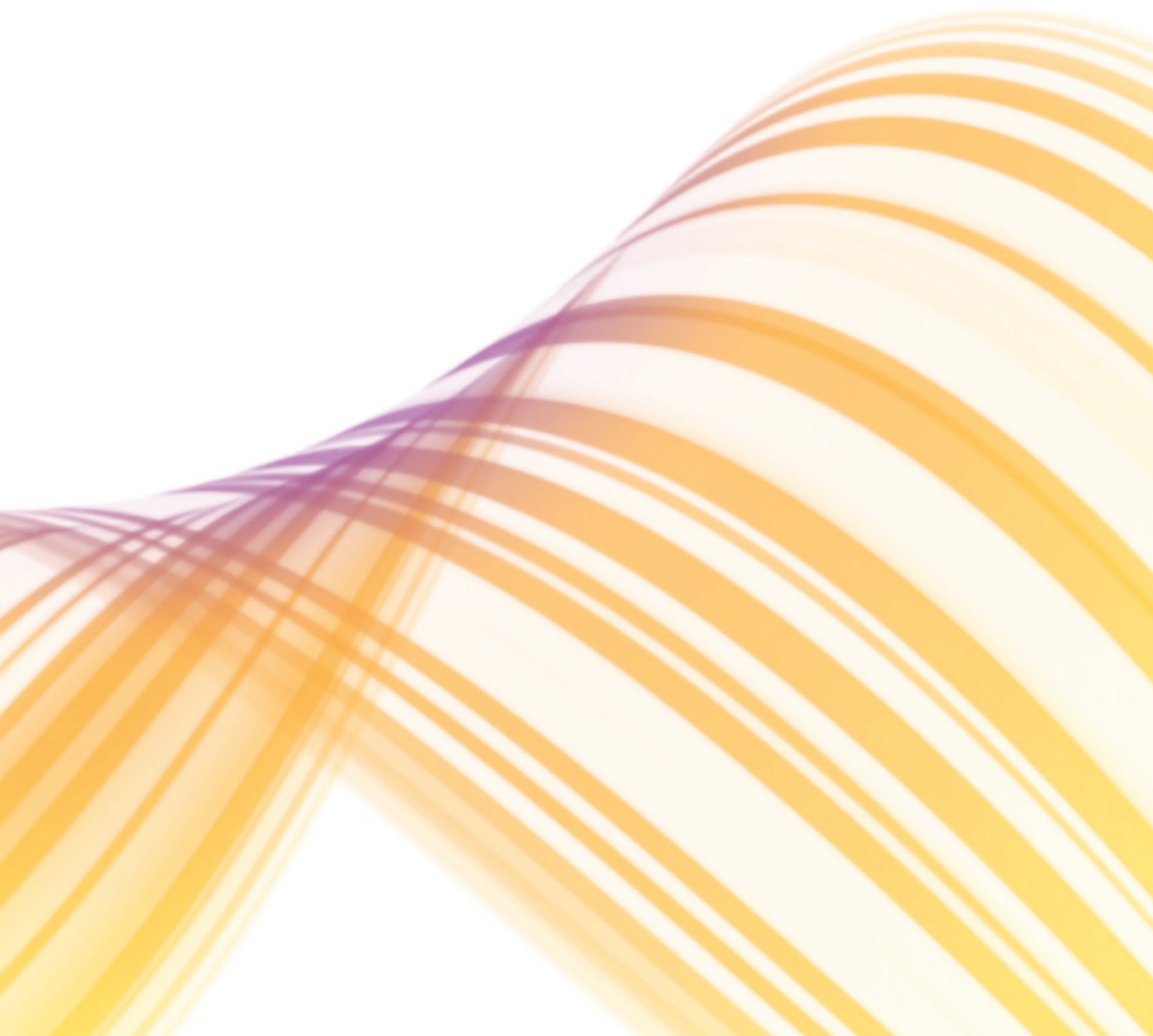


# Nokia Siemens Networks Subscriber Data Management Strategic data consolidation



# Introduction

Out of all the questions that have faced service providers over the last few years, some of the most intense debates have focused on identifying what key assets they possess and how they can best use these to remain competitive in a constantly changing landscape.

## Contents

- Introduction
- Bringing together the lessons from the past
- Putting the customer first in a real-time world
- The Nokia Siemens Networks data consolidation approach
- Customer approaches to data consolidation
- Taking data consolidation to its final conclusion

As a result of widespread technological and regulatory change, the ability of an operator's network to efficiently realize new revenue streams is no longer as obvious as it once was. The rapid spread of new media, e-commerce and application-based services is combining with the growing impact of social networking to challenge both the traditional dominance of the network operator and the business models that have served it well in the past.

While operators re-engineer their networks to take advantage of the cost and performance benefits of an all-IP environment, they must also continue the journey to transform their organizations – away from the

old feature and application-centric networks towards today's imperative of deploying competitive subscriber-centric networks. The new world of telecommunications is characterized by openness, agility and an implicit ability to respond rapidly to new opportunities. Much service innovation and brand value will therefore, by necessity, come from harnessing multi-faceted eco-systems beyond traditional boundaries, including 3rd party providers and developers – or indeed even from the end customers themselves.

How an operator responds to these opportunities will decide its eventual fate. However, out of all the assets that a service provider possesses, perhaps the most crucial of these lies in its subscribers and the data that defines their behavior, persona and preferences. This data – largely unexploited and fragmented across networks today – offers a fountain of knowledge and information about customers. By unifying and consolidating this data, operators will begin to address the fundamental barriers to service adoption. Examples here include the ability to dynamically personalize services based on customer and profile-user behavior, the ability to manage customer identity, charging and preference information as they roam across disparate network environments, and also ensuring a consistent presentation of services as customers change devices between home, office and mobile environments.

Many new opportunities are also emerging on Internet time. Operators continue to have considerable

success as a channel to consumers for a growing 3rd party content industry. These new layers of Web 2.0 applications are seen by many as an opportunity to develop a more diverse and rewarding service offering. However, the challenge for service providers is to be more than a bit-pipe, positioning themselves as a value-added channel to market for these services, packaging and enhancing the proposition to improve the customer experience. By acting as the consumer's guardian, operators can securely broker their customers' relationships with 3rd party services, facilitating their journey of new media and content discovery. Of course, this also implies that the operator will play an even more important role in the future in protecting the consumers' privacy. Consumers will only trust those who demonstrate that their data is being appropriately used and not abused. Ideally, data would be provided in exchange for some benefit, convenience or monetary value.

For service providers to access a greater share of the consumer wallet, they will ultimately need to harness the power of their subscriber data to enhance their own propositions and those of third parties. This will entail the consolidation of all essential network, device, service and user data which, for the present, lies largely fragmented. What will then be needed are tools to help the service provider exploit and expose that data in commercially meaningful and profitable ways. Without these tools, the service provider's armoury will remain locked and any meaningful response to competitive threats will effectively stay muzzled.

# Bringing together the lessons from the past

The journey to focus on customer data has been a long and slow one. In the late 1990's, as choice and competition became realities in deregulating markets around the world, service providers began to concentrate on trying to improve their understanding of their own routes to market – the underlying access and transport networks. In many cases, information was lost, fragmented or held in incompatible paper and data formats. The result was an increasing emphasis on inventory control and the introduction of new systems and techniques capable of consolidating network resources and applying this information to multiple engineering, CRM, operations and management activities.

Around the same time came a growing realization that traditional approaches to service creation and management would no longer serve an increasingly cost-conscious environment and that reduced time-to-market and service agility would become key differentiators. The old 'silo' mentality of developing entirely new – and largely unconnected –

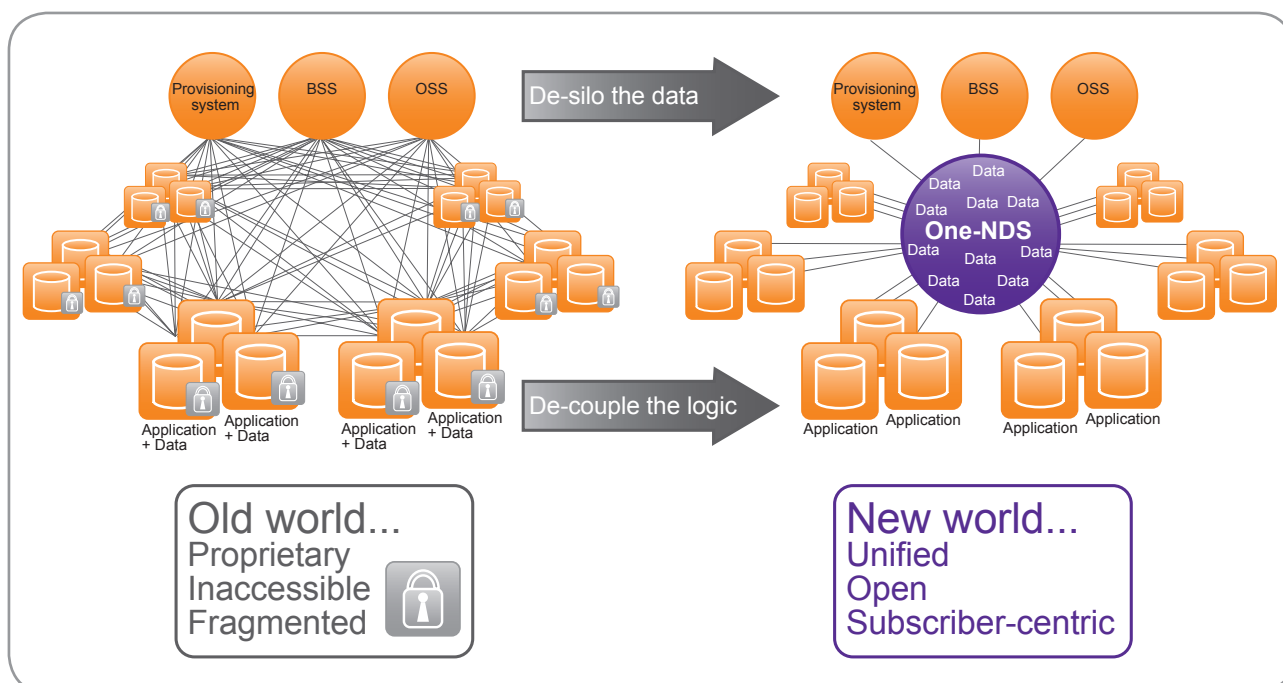
platforms for each new service as it appeared was inevitably untenable, whether this applied to IN-based services or the entire back office.

Here, a number of strategies are already proving successful in resolving these difficulties, ranging from the emergence of Service Delivery Frameworks, the use of new architectures (e.g. IMS and SOA) and protocols (e.g. SIP and Diameter), and the evolution of standardized data modelling frameworks.

Developments such as these, while improving the cost-efficiency and performance of both the network and the back and front office systems supporting it, are also forcing service providers to reassess their impact on the area of customer data. On one hand this is part of the industry-wide shift towards supporting a subscriber-centric, as opposed to network-centric, view of the world. On the other hand, it reflects the application of new technologies – such as the Home Subscriber Server (HSS) in the IMS architecture, a greatly expanded version of the

old GSM Home Location Register (HLR) – and a driving need to start enhancing identity-related functions and features to deal with the new service capabilities such as policy, location, presence and charging.

Subscriber data can – and should – increasingly be used for multiple purposes. For some operators, its prime use will be in optimizing the network to cope with the wider variations in traffic and anomalous behaviors that will necessarily appear as new services are rolled out. For others, it will translate into subscriber intelligence, bringing greater accuracy in designing and targeting new services to customers, as well as providing fast feedback on customer take-up and satisfaction. Finally, given the continuing trend towards truly personalized and ubiquitous communications and concerns about privacy, appropriate content and security, some service providers may choose to focus on identity management and protection services, applying federated identity principles to act as a trusted gateway to the online world.



# Putting the customer first in a real-time world

Service providers have become detached from their real-time subscriber data – which severely limits their capacity to appropriately interact with their customers and their partners. This interaction, however, would be valuable to block out new competitors emerging from the content or retail sectors, and to exploit the new possibilities of aggregate services coming from Web 2.0 communities or the convergence of fixed and mobile services.

At present, for many service providers, customer data is spread across many different systems – often across different departments and in totally incompatible formats – with all the ultimately unnecessary cost, efficiency, error, duplication, synchronization, support and integration overheads that accompany such an approach. Given the history of the telecommunications sector, such an inheritance has been unavoidable. What's important now is to make sure that the inheritance of data fragmentation doesn't continue to cause further complications and headaches in the future.

As the metabolism of the whole industry gears up several notches at once, network architectures and their underlying IT systems must be able to respond in real-time to increasingly complex interactions as customers move between devices, access technologies, payment methods and even identities. With the future of telecommunications being predicated on an ability to offer speech, content and applications 'anytime, anyplace, anywhere' – to the same rigorous standards of service quality – it's fast becoming clear that this vision will be severely limited by an inability to bring together relevant subscriber data:

- As the customers move from cellular to WiFi networks or home PC's, their device preferences are lost and services become annoyingly inconsistent.
- As domestic broadband customers surf between their IPTV, web, email, RSS feeds and MMS, their service preferences and supporting data fail to transfer.

- As tele-workers move between personal and business time during a normal day, they are faced with having to constantly re-key and re-log network identity information to gain access to the right environment.
- Service providers have limited ability to combine contextual information with interests, communities and content to offer attractive and premium-priced aggregated services.

If a network operator is to make the essential next step towards providing what are truly personalized services, then a consolidated, real-time, de-fragmented picture of the subscriber must be available to act as the catalyst for rapid service creation, deployment and delivery.

## The Nokia Siemens Networks data consolidation approach

In response to these problems, Nokia Siemens Networks has developed the Subscriber Data Management (SDM) solution, an open, standards-based architecture that sits at the heart of the network creating a horizontal and unified subscriber data layer across all applications. By separating application logic from the subscriber data, Subscriber Data Management

liberates and unifies customer data that is currently locked away in silo, closed and often proprietary systems.

Through this unified approach, mobile, fixed and broadband service providers can take control of their subscriber information, unlocking and securely sharing data across an array of applications, networks and

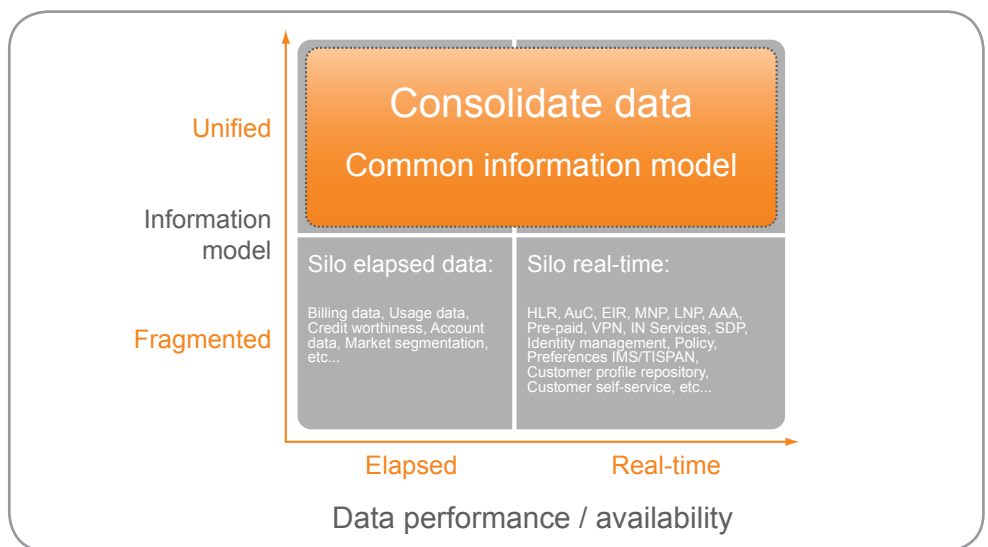
partners. By consolidating this data, applications are able to share one complete, rich and consistent view of the subscriber data instead of limiting its usage.

Nokia Siemens Networks' data consolidation approach achieves this through several ways:

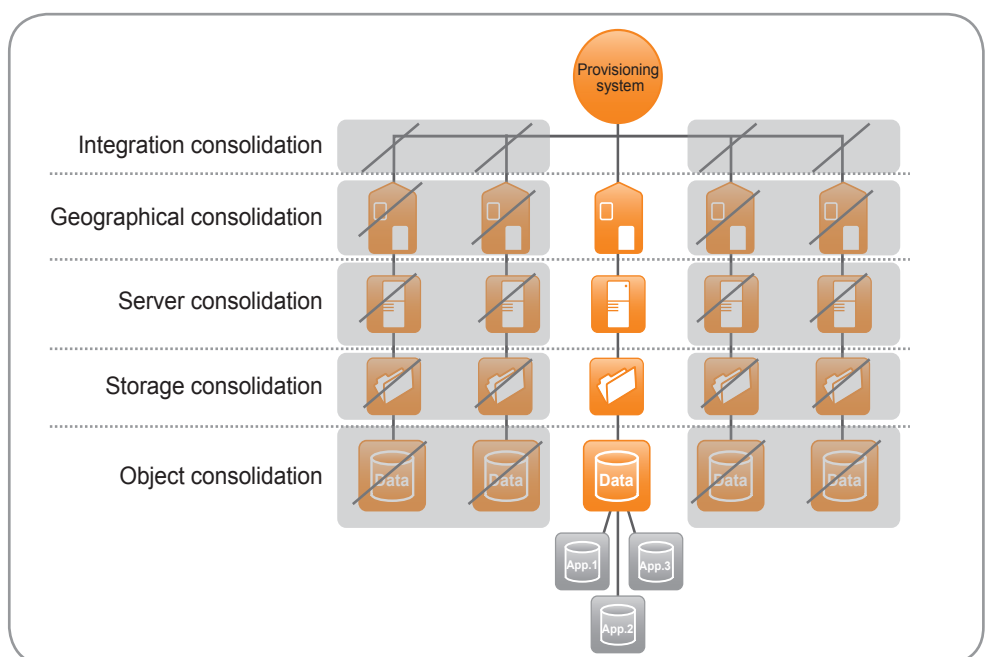
- By creating one operator Common Information Model (CIM), subscriber data can be harmonized across the network into one logical data layer, removing data inconsistencies and duplications. This ensures your distributed data architecture can be centrally managed throughout its life cycle, essential to the evolution and integrity of the data model.
- Where data cannot be consolidated, it is federated from silo data sources to bring it into one complete view. All data appears to form one common information model, but may indeed be stored in a third-party SQL RDBMS database.
- By having one database, only one point of integration is exposed for all applications. This simplifies subscriber and service provisioning, eliminates application integration complexity – and means that only one database ever needs to be updated.
- Wasted network capacity is eliminated by simplifying network architecture, reducing server and storage requirements, and sub-optimal usage of database software licenses.
- System resilience and scalability can be more optimally managed through Data Consolidation, delivering carrier-scale availability through the Nokia Siemens Networks highly distributed real-time architecture.

It's also important to remember that this is a far more powerful concept than the simplistic approach of 'putting everything into the same box' that some vendors may promote. While alone it delivers demonstrable savings, it's from the flexibility in how subscriber data is structured, distributed, exposed and managed that the real tactical

and strategic benefits accrue – and that's where Nokia Siemens Networks data consolidation approach demonstrates its benefits: through the creation of a Common Information Model tailored to the operator's unique data requirements.



Nokia Siemens Networks' strategic data consolidation – creating a common information model



Benefits of Nokia Siemens Networks all-encompassing data consolidation strategy

# Customer approaches to data consolidation

Data consolidation is being addressed by operators in different ways. Some have started to consolidate core network applications, others have consolidated services such as messaging, portal and content, while others have begun their journey consolidating subscriber profile data to become a new generation smart ISP.

## **Case 1: Converged core infrastructure consolidation**

Due to rapid network expansion since its launch, one of North America's leading tier-one mobile operators had developed a complex core network environment. The hardware-based architecture had grown unwieldy overtime, limiting the operator's ability to scale its network architecture, locking subscriber data into vendor silos and also putting a tremendous strain on OPEX budgets. Not only were operations and maintenance costs becoming disproportionate, but the architecture also meant that every new application that required access to the network elements' data had to interface across several disparate systems, each potentially with its own proprietary interface. This architecture was both limiting the operator's ability to introduce attractive new services and to migrate towards a new generation network in the near future.

Nokia Siemens Networks' One-AAA solution deployed a consolidated, extensible data layer, replacing an existing home grown AAA implementation with cost-effective, high performance, off-the-shelf IT equipment. The data layer is under-pinned by the Nokia Siemens Networks extensible subscriber data management solution providing one point of integration for all network elements, applications, provisioning and administration systems, while also delivering a seamless migration path towards

new generation architectures. Since deploying One-AAA the operator has continued to consolidate further network applications, including the HLR (Home Location Register), and has, by introducing a pan-network subscriber profile repository, created a powerful shared asset at the heart of the network.

## **Case 2: Service Delivery Framework (SDF) data unification**

A leading Indian service provider needed to react rapidly to changing market conditions by creating a Services Oriented Architecture (SOA) framework to ensure agile service design, delivery and operation. Rolling out vertically integrated applications had proven to provide a fast and economic solution in the short term, but as more applications were added, the operator realized that this architecture was not scalable and was becoming unmanageable.

Nokia Siemens Networks' solution provided a single logical repository as part of an SDF architecture. The common repository became a unified data store shared by all applications and platform common service enablers. Through the Nokia Siemens Networks One-NDS (Network Directory Server) software-based centralized repository, the service provider has a single view of subscriber and service data, available on-demand across an enhanced portfolio of content, applications and services, accessible via SMS, MMS, WAP and broadband. It cuts new service deployment time and provisioning effort as all services share a common directory, resulting in significant reductions in OPEX. Nokia Siemens Networks One-NDS provides a completely unique and efficient way to architect value-added service platforms, ensuring any service data is liberated and free to be shared.

## **Case 3: A network-wide Common User Repository (CUR)**

Competing in an extremely fast moving and dynamic market, a leading tier-one mobile operator in Western Europe needed to find a way to create a better and more consistent experience for its users. In an environment where customers change devices frequently and regularly access a number of services, the operator set a challenge to itself to find easier ways of bundling services by harmonizing subscriber profile data.

Nokia Siemens Networks' solution was to deploy its subscriber data management solution which provides a single extensible common user repository to unify the customer profile data locked away in different supporting applications. Data such as identity, portal, voicemail, service, network and advert preferences were combined. Now, if a user changes his or her handset, there is only one database that needs to be updated, the user only needs to sign-on once to access all services, and preferences are maintained as the user moves between each application, network and device.

# Taking data consolidation to its final conclusion

The telecommunications industry is familiar with the issues associated with a silo information architecture that has grown organically over the years, as well as with their impact on costs and time-to-market. What's been less clear until recently is how these problems could be resolved cost-effectively.

Some vendors have proposed a solely federated approach to data silo issues, but evidence shows that this brings with it problems of scalability, response times, increased vulnerabilities to point failures as well as a highly uncertain return-on-investment in what will be a high profile corporate project. Other vendors are proposing stovepipe software-based solutions based on relational database technology that are not ideally suited to the performance-critical and distributed environments of today's telecommunications networks and services.

By contrast, the Nokia Siemens Networks data consolidation approach is all encompassing, unifying the data model requirements of existing and future applications while accommodating legacy applications that may be federated and migrated to the common database over time. This has been translated into a formal methodology that is then used with clients to develop their own unified data architecture, unifying historically fragmented data schemas and structuring the information for optimal access.

This process is both elegant and powerful. Consolidation can eliminate wasted unused capacity from existing systems by up to 30%, and data model unification can consolidate a further 25% of data storage that is wasted through duplication or inconsistencies. With a return-on-investment that is typically just over one year, the sooner you implement your data consolidation strategy with Nokia Siemens Networks, the faster you will realize the benefits.

Nokia Siemens Networks Corporation  
P.O. Box 1  
FI-02022  
NOKIA SIEMENS NETWORKS  
Finland

**Visiting address:**

Karaportti 3, ESPOO,  
Finland

**Switchboard**

+358 71 400 4000 (Finland)  
+49 89 5159 01 (Germany)

Copyright © 2008 Nokia Siemens Networks.  
All rights reserved

Nokia Siemens Networks and the wave logo  
are registered trademarks of Nokia Siemens  
Networks. Other company and product names  
mentioned herein may be trademarks or trade  
names of their respective owners.

This publication is issued to provide information  
only and is not to form part of any order contract.  
The products and services described herein are  
subject to availability and change without notice.

C401-00236-WP-200806-2-EN  
Nokia Siemens Networks - 06/2008 Contra