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March 2009

IBM SPDE – Enabling Service Providers to Work Smarter

An Executive Brief

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Executive Summary

Those communications providers that don't own their own access networks often understand well how to effectively market to business customers and consumers, and because they are not endowed with "incumbent" status, are the very organizations that are changing the Communications Service Provider (CSP) competitive landscape. Smartphone devices from various manufacturers are presently associated with several network-based operators around the world, which combine 2.5G/3G network connectivity with internet-based content and applications. However, this strategy is likely to change in the near future as consumer electronics and mobile voice technology are rapidly consolidating. Voice communications as an IP service—VoIP via a broadband connection—is just one of many applications enabled from a single device by customers for a variety of business and personal needs.

For CSPs to "stay up with technology" huge demand—at an increasingly faster pace—is now placed on internal IT resources to better enable today's installed Operations Support Systems (OSS) and Business Support Systems (BSS). Along with systems change is a heavy requirement to update and modify the business processes tied to defining new services, providing customers with choice in service options, provisioning each service, billing for service usage and of course assuring each service works every time the customer expects it to work. Tied to these requirements are the increasing levels of network flexibility offered through the latest advances in technology infrastructure, which are driving service availability to any time, anywhere, on any device. In addition, there is a growing awareness of network, service, and customer data to be collected, processed and harvested for better understanding of customer needs and to more effectively match those needs with business capability.

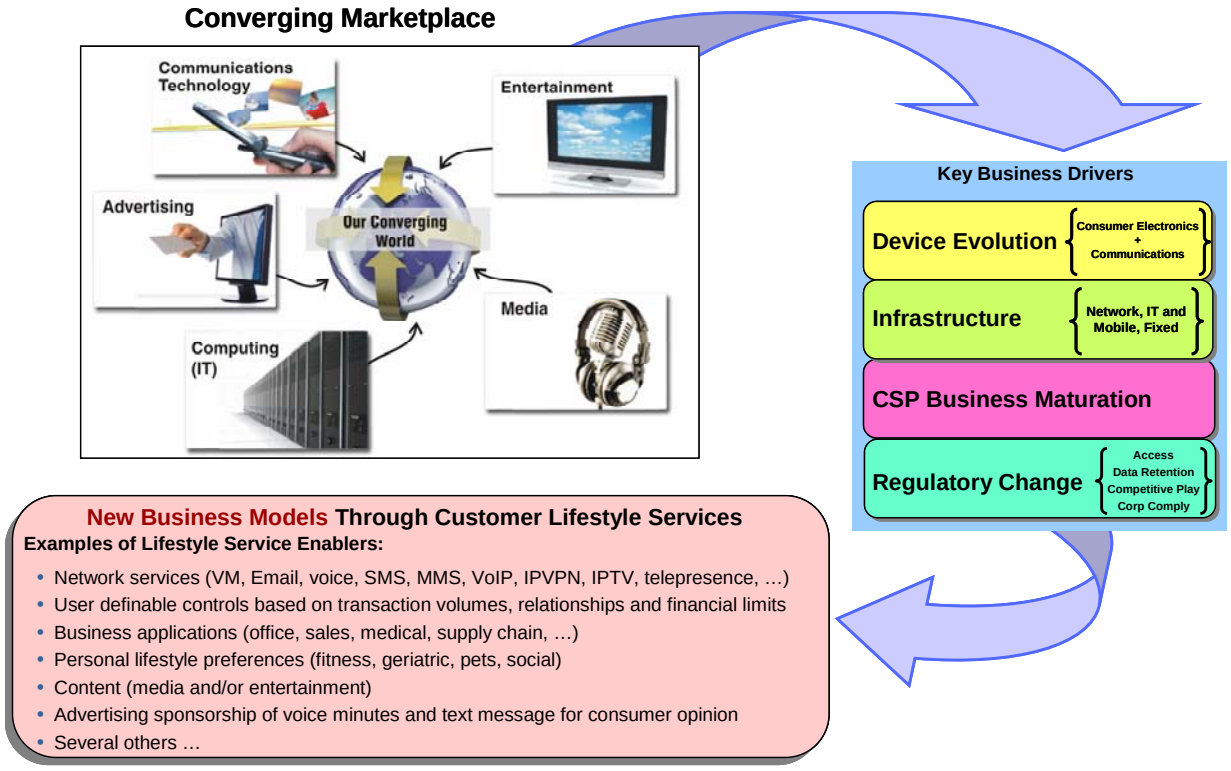
This report discusses the key business drivers moving the communications industry toward "customer lifestyle services." Such services require a variety of capabilities CSPs must address regarding both network connectivity and content interaction. The report points out why today's CSP installed systems and business processes must be transformed to more effectively meet the changing needs of the converging communications industry. It provides a brief history concerning IBM's Service Provider Delivery Environment (SPDE) strategy. The bulk of this report summarizes the latest capabilities IBM's SPDE 3.0 brings to bear and highlights a number of case examples successfully addressing the transformation challenges CSPs must deal with today and in the near-term future.

The Converging Communications Marketplace

Industry Convergence

Today's market landscape is much more than simply the convergence of fixed line and mobile technologies. The telecommunications industry is converging with the means of other markets including those from IT (e.g. data storage, security functions, and applications), media (print and broadcast news), entertainment (gaming, video, broadcasting), and advertising. As shown in Figure 1 below, convergence of these multiple industries is defining business drivers that are producing new capabilities for better meeting today's customer "lifestyle" needs. For the CSP community, such change is driving a new level of "real time" Operations Support Systems (OSS) and Business Support Systems (BSS) requirements, which in turn are placing an overwhelming demand on Information Technology (IT) resources to change, enhance and/or replace existing OSS/BSS.

Figure 1 – The Market Drivers of Change



Source: Stratecast

New Generation Service Offerings – Lifestyle Services

Stratecast defines customer lifestyle services as any combination of network capabilities, content, and user device features for addressing a variety of lifestyle preferences defined by business, social or personal interest categories. These complex offerings can involve a number of capabilities alone or together including: multiple network access methods (broadband, mobile, fixed line); network services (email, VM, voice, and IP-X e.g. IP-VPN, IP-PBX, IPTV); IT functions (data storage, business applications, single sign-on security); media and/or interactive content. Examples of such services, which are deployed by some organizations already, include the following:

- **Interactive Multi-flow Messaging** – The best example of multi-flow messaging services comes from the entertainment sector, and in particular, gaming, with its real-time, coordinated multi-flow needs (e.g. game logic flow, video flow, communication flow via voice or IM, and a player presence flow). Other multi-flow services for both business and consumers are also possible including distance learning, social networking, telepresence meetings, high-technology collaborative research, transportation/logistics management, and marketing/sales coordination.
- **Business Application Solutions** – Business solutions can take on many forms involving packaged or individualized groupings of network/content functions such as email, office applications, data storage, security, VoIP, specialized applications particular to an industry vertical, and a variety of push or pull content sources. Some operators even include the necessary user device tools based on Software as a Service (SaaS) models.
- **Telemedicine** – Telemedicine services include several areas as the healthcare industry looks for ways to cut costs including: life function monitoring (pacemaker/defibrillator heart monitoring, high risk fetal/neonatal monitoring, and "at-home" geriatric monitoring) via a wireless or fixed line connection tied to "on-tap" analysis applications or specialized customer care services; clinical records analysis and correlation between healthcare facilities and/or insurance companies via common data storage and secure access; medical imaging data storage and retrieval through remote secure access; and for patients with chronic medical conditions, records coordination between same provider clinics and multiple healthcare facilities via patient-authorized secure assess.
- **Machine-to-Machine Interaction** – Remote monitoring and assembly of raw data to usable "information blocks" that are then passed to other "added value" applications. Examples include remote device dispenser monitoring integrated to a supply chain system or aggregation of remote sensor fluid flows with critical manufacturing environmental definitions for optimizing service delivery performance.
- **Health and Fitness** – Bringing together presence and availability functions to chart jogging progress via a GPS-enabled mobile device. The long-term opportunity may even allow a mobile device to possess health monitoring capabilities (e.g. pulse, blood pressure, oxygen saturation, and respiration rate) based on a user-defined set of conditions combined with individual presence (location, time from start, pace, and time-to-completion).

Processes and systems to support these new services, and in many cases engage as part of the service, are redefining the way OSS/BSS are used globally.

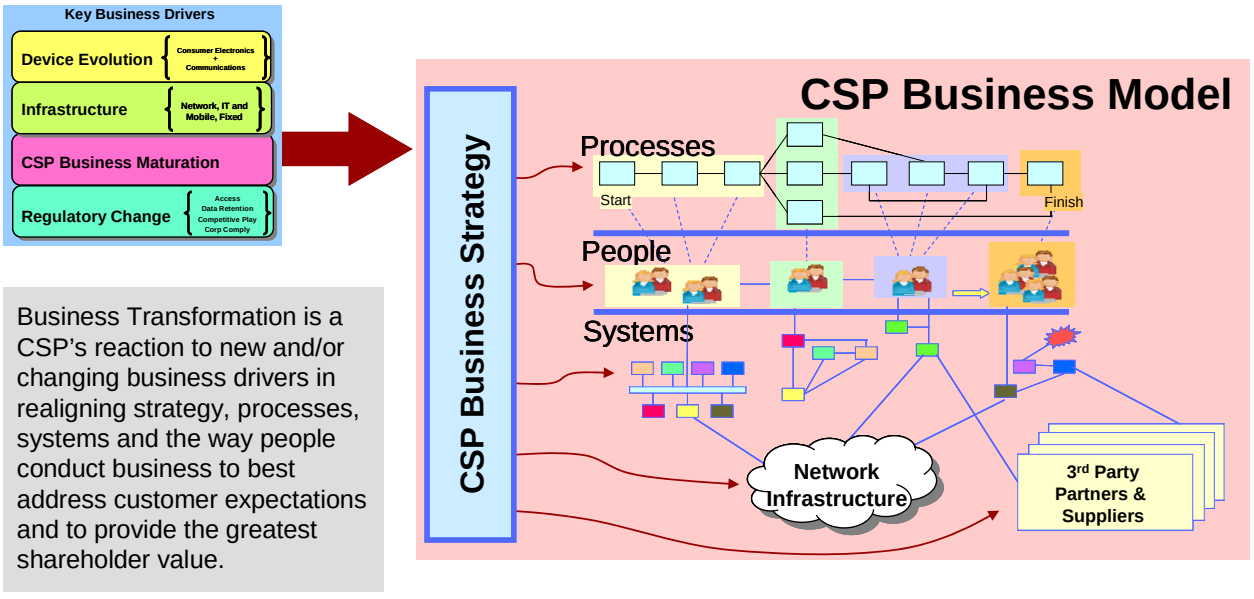
Addressing CSP Business Change

Based on network technology and personal electronics evolution, business customers and consumers now have choice when addressing a growing list of needs—in network access, in service definition and manageability, in interacting with media and entertainment content, and even in how services are subscribed and paid for. Several of these choices now involve some type of real-time manageability features. The thrust of today's needed change in business approach, as shown in Figure 2 below, rests in realignment of processes, systems, and the way business is conducted. This is essential to better address a variety of the multiple issues involving offers of lifestyle services.

Many of the large business solution suppliers have recognized this shift and are now much more focused on end-to-end business improvements, while others are still trying to get it right. For

example, IBM continues working with several different CSPs around the world to redefine the way they do business. This is accomplished by emphasizing new ways to address subscriber growth while at the same time making improvements to processes and systems to reduce operating costs, improve overall end-user satisfaction, deliver more appealing lifestyle services as a point of differentiation and to successfully augment declining revenues from traditional services.

Figure 2 - Business Transformation is More Than a Shift in Business Strategy



Source: Stratecast

For CSPs that have taken the first steps in the transformation journey[1] for their business processes and systems to address the new generation customer lifestyle services, the future looks very promising. For those considering what to do next there is time. However, holding back to wait out the current storm of economic uncertainty is not a safe harbor. As technology evolution continues, CSPs still deciding on a "best strategy" for their business needs should look closely at partnering with a supplier possessing proven transformation credentials. Choosing an unproven path, given today's economic uncertainties, substantially increases the risk of major disappointment and serious business concern in the months to come.

IBM's Strategy for Communications Industry Evolution

IBM's Service Provider Delivery Environment (SPDE)

In early 2001, IBM identified the telecommunications market as one of its strategic focus areas, with specific attention to the top 25 global CSPs. To serve this segment, the company introduced the

[1] Business transformation within the communications industry is a journey and not a destination. Stratecast defines it is as a CSP's reaction to some or all of today's business drivers (technology evolution at both the network and user device level, changing regulation, and a maturing of the CSP marketplace) in realigning strategy, processes, systems and the way people conduct business to best meet the needs of technology evolution, changing customer expectations, and in providing the greatest shareholder value.

Service Provider Delivery Environment (SPDE), which was defined as IBM's current go-to-market strategy for the telecommunications sector. More specifically, a Stratecast report assessing IBM's foray into the telecom sector stated: "**SPDE includes an IBM-supplied reference architecture for application integration and business process management, professional services, demonstrated integration capability through the company's Network Integration Labs (NIL), pre-defined process templates, an extensible data platform, and partner programs**."[2]

IBM officially launched SPDE in February 2002, defining it as a "… comprehensive delivery and management architecture for content and applications through multiple transport environments without significant modification. It is based on open IT and telecom standards and is designed to take advantage of telco industry standards such as Parlay and OMA (Open Mobile Architecture) as they emerge, as well as key emerging Internet standards such as UDDI, WSDL, and SOAP that are key to delivering Web Services."[3]

Shown in Figure 3 below, the 2001 SPDE framework was focused on supporting mobile data services in a way that was standards-based in a soon-to-be-proven cost effective manner. It would also allow CSPs to introduce traditional network services combined with application and content capabilities. From these early beginnings SPDE was clearly designed to be more than a technical architecture, as consideration for the end-to-end business needs tied to addressing the evolving new generation of "network connectivity plus content" services was starting to take shape.

Keeping pace with technology evolution, SPDE 2.0 was launched in early 2006. In addition to what SPDE 2001 offered, the new version included Telecom Operations Content Packs based on industry standards from the TM Forum[4], an advancement of Web Services functions in the form of Service Oriented Architecture (SOA) standards, and "… extensions to accommodate the specific requirements of the 3GPP[5] IMS architecture. The solution comprises two main environments -- Service Execution and Service Creation."[6] Specifics about each of these extensions, with reference to a major implementation project for Swisscom at the time, included the following:

- **Service Creation Environment** – The Service Creation environment was defined as a "… model-driven and integrated set of tools for creating, deploying and reusing services and software components. The environment includes a well-defined and automated process

[2] Stratecast Report *"OSSCS 03-04 An Assessment of IBM's Telecom Strategy: Service Provider Delivery Environment (SPDE),"* August 2002.

[3] IBM Press Release *"IBM Offers 'Speedy' Introduction of Next-Generation Wireless and Telecom Services – New Framework Cuts Development Time from Months to Weeks,"* February 19, 2002.

[4] IBM's Telecom Operations Content Packs incorporate standards definitions based on the TM Forum's Next Generation OSS (NGOSS) enhanced Telecom Operations Map (eTOM), NGOSS Telecom Applications Map (TAM), NGOSS Shared Information Data (SID) model, NGOSS OSS through Java (OSS/J) interface definitions, and the NGOSS Multi-Technology Operations Systems Interface (MTOSI) for messaging schemas.

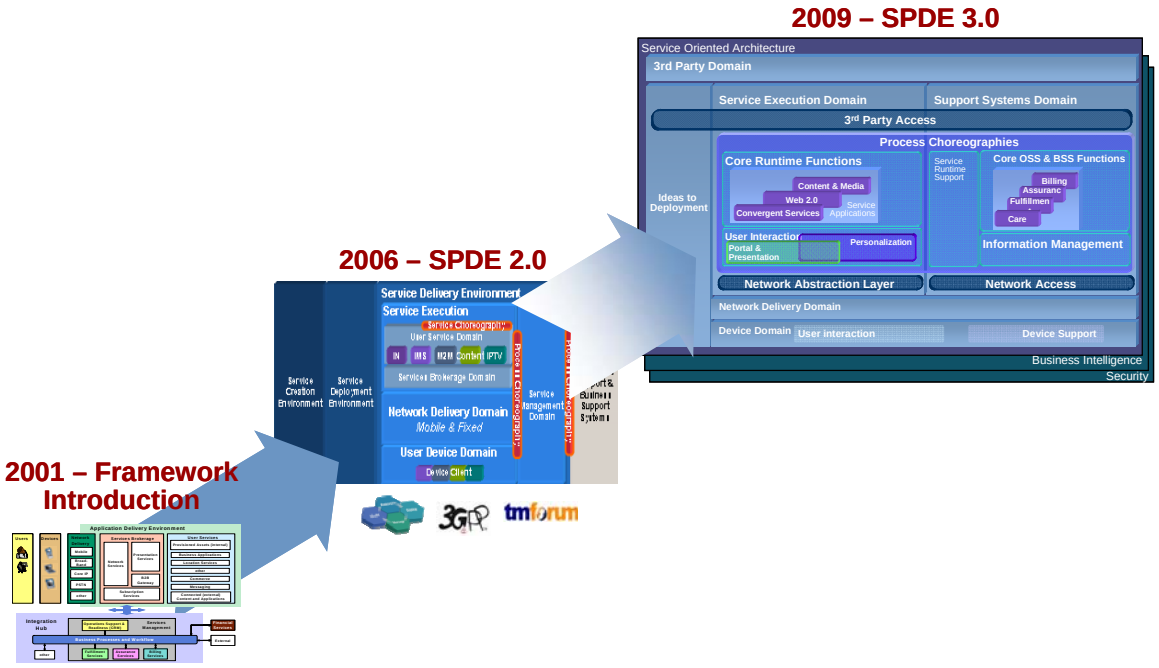
[5] The 3rd Generation Partnership Project (3GPP) is a collaboration effort between groups of telecommunications associations, to make a globally applicable third generation (3G) mobile phone system specification.

[6] IBM Press Release *"Telecommunications Operators Can Reduce Time-to-Market With New Platform – Swisscom Mobile and IBM Have Demonstrated the Capability to More Efficiently and Rapidly Create Telecom Services and Incorporate Third-Party Applications,"* February 13, 2006.

offering guidance across the service creation lifecycle. The domain is realized using an integrated set of technology including IBM's WebSphere and Rational software …."[7]

- **Service Execution Environment** – In an early deployment at Swisscom, the Service Execution environment utilized "… Nortel's IMS control plane located at IBM's Montpellier facility and which is connected to Swisscom Mobile's network via IP VPN circuits."[8]

Figure 3 - IBM SPDE Framework Evolution (2001 to Today)



Source: IBM

SPDE 3.0 – Service Delivery AND Business Process Support

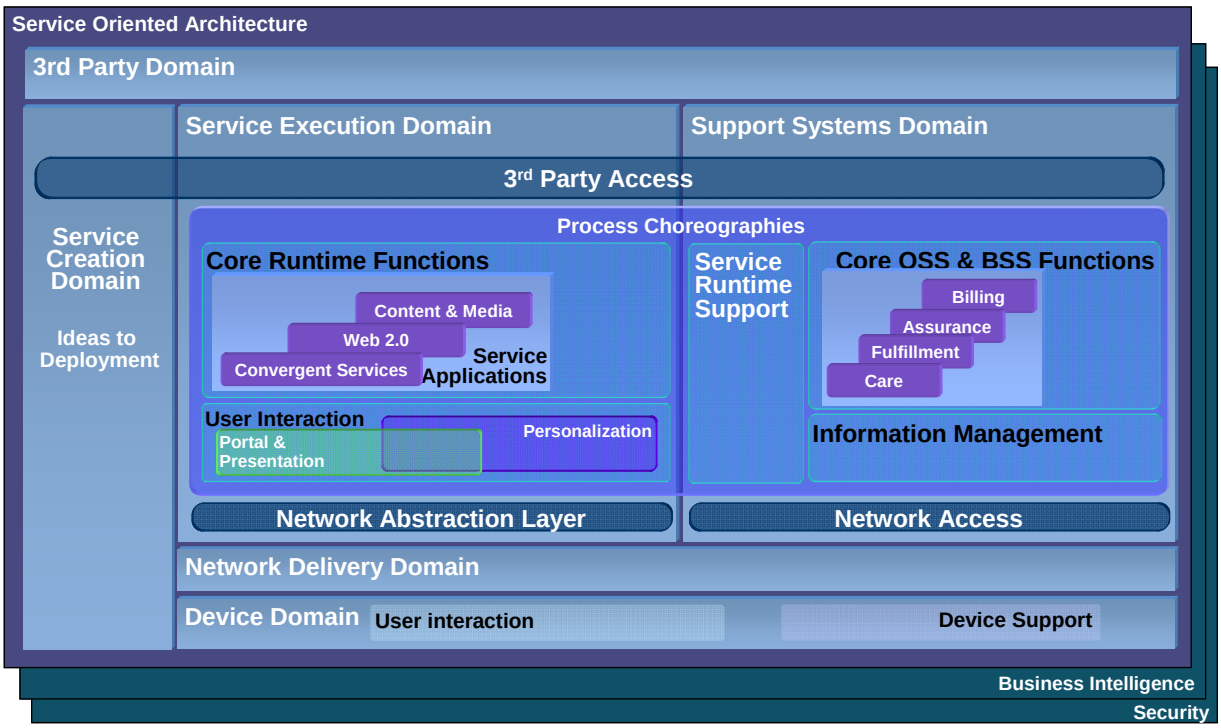
The SPDE 3.0 Framework, shown in Figure 4 below, was announced in February 2009[9]. Beyond what SPDE 2.0 provided, the current version includes capabilities not typically identified with the technology architecture the industry today has come to call a Service Delivery Platform (SDP). While no specific industry standard has been established for an SDP, the basic expectations from any such services framework involves: the ability for a CSP to create new services from various network-based building blocks; implement these services and control their behavior when operationalized within a public or private communications network; and interface through standard protocols with existing network equipment.

[7] Ibid.

[8] Ibid.

[9] IBM Press Release *"IBM Unveils Next Generation Service Delivery Framework to Help Communications Service Providers Thrive in an Interconnected World,"* February 11, 2009.

Figure 4 – IBM Service Provider Delivery Environment 3.0



Source: IBM

What makes SPDE 3.0 more than just a technology architecture is its focus on the end-to-end solution support picture pertaining to the business issues around today's customer-focused complex lifestyle services. Some of these "operational and management functions", beyond the actual service delivery capabilities previously mentioned include:

- An ideation environment that can evolve service concepts to service implementation realities
- Advances in SOA-based business processes critical for immediate support of new service options
- Media integration functions in the form of composite services for enabling CSPs to blend entertainment, advertising and other forms of digital media into complex customer services that can be offered across a variety of networks and devices
- Service runtime support for core OSS/BSS functions including customer care, fulfillment, billing and assurance
- Expansion into the service management domain to help automate and secure a dynamic infrastructure of applications, systems and networks
- Business intelligence capabilities for analyzing consumer usage behaviors and trends as a means for helping CSPs improve the success of their service portfolio, better understand customer preferences, and improve overall network performance
- Advanced security functions.

IBM has approached the business transformation challenge, through SPDE 3.0, with numerous customers emphasizing a variety of focal points. Some of these are approaching transformation from the service innovation and exposure perspective. Others are going about it from an

information management, service assurance and even multi-systems integration point of view. Since no two CSP business strategies are alike, to better explain how SPDE 3.0 addresses a number of needs within the CSP marketplace today, the balance of this report offers several customer case examples tied to the following critical business functions:

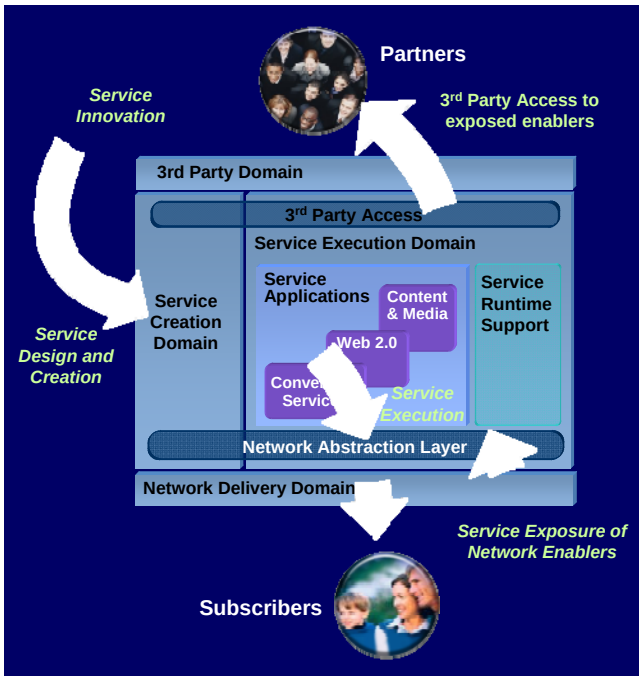
- Accelerating the rapid definition and launch of new services
- Reducing the cost of operations and optimizing understanding of operational information
- Differentiating the end-user customer experience.

Addressing Key Industry Imperatives

Accelerate Service Innovation & Delivery

- The SPDE 3.0 service creation and execution domains are a major point of emphasis for CSPs looking to expand their service footprint through offerings with appeal to the customer lifestyle needs previously described. As shown in Figure 5 below, the Service Innovation, Design and Creation process is set up to enhance the "idea-to-implementation" portion of a new service launch.

Figure 5 – Expands Source of Innovation and Shortens Development Cycle



Source: IBM

Components of SPDE 3.0 supporting this need include:

- **Service Innovation** – Uses IBM's array of initiatives with Web 2.0 for a dynamic and connected "ideation" process.

- **Service Design and Creation** – Incorporates IBM's Rational service creation capabilities for building IP-based converged communications applications. This involves a suite of tools tied to service concept & definition, service design, service development, service testing, and service deployment.
- **Service Execution** – IBM's WebSphere execution platform provides a common SOA-based approach for composite service applications, leveraging presence, voice, media and IT enablers.
- **Service Exposure** – Industry-standard Web service exposure of telecom network capabilities and connections into the Web 2.0 world.

Implementation examples include the following:

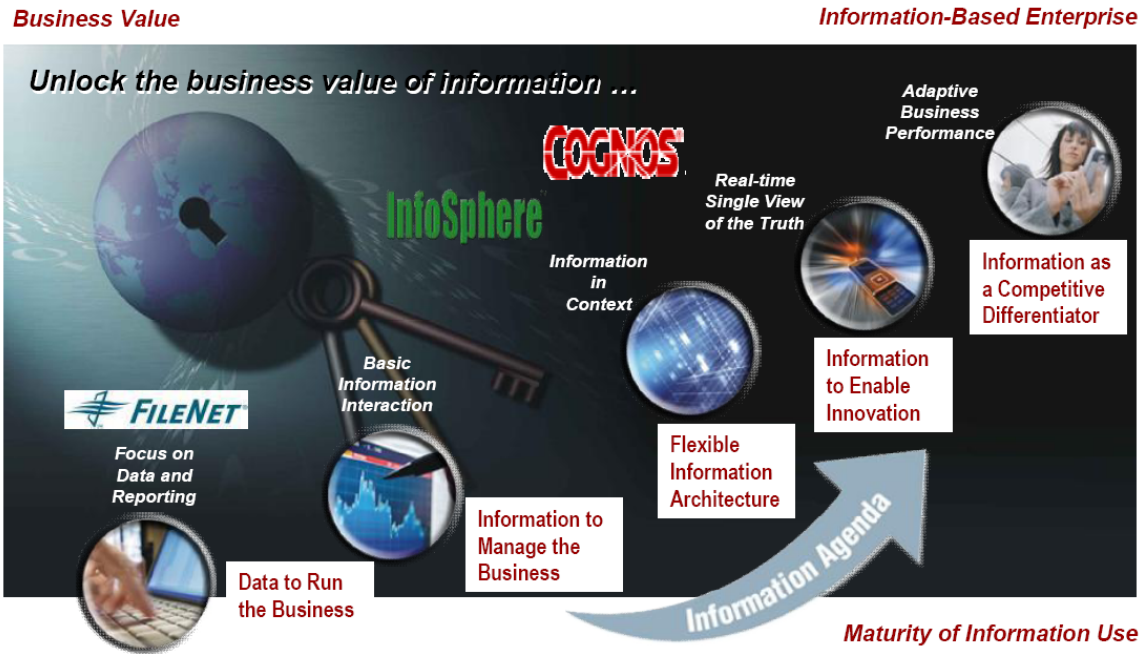
- **Improving Service Innovation and Time-to-Market** – A large Asian CSP implemented IBM's Idea Factory to create a collaboration environment for product managers, partners, and end-users. Idea Factory is part of the IBM Service Innovation, Design and Creation Domain. In this example, a portal allows product managers to set up a trial using templates and tools to on-board users, conduct surveys, prompt for feedback, collect all responses, and analyze results. During a 9-month period, this CSP was able to identify 27 new services based on 576 defined ideas. Without Idea Factory, only 3 new services from 259 ideas were previously established in approximately the same time period. The first suggestion was entered to the system only 10 minutes after initial implementation, which showed the level of interest in this advanced way of bringing a number of thought/action processes together.
- **User Assisted Service Definition –** A large Asian operator sponsored a contest to develop next generation applications. Controlled access to network information from services such as SMS, call control, presence and IMS to internal employees and external users was provided as Web services. By offering a secured environment this operator successfully demonstrated it can tap into the creativity and innovation of third party developers and Web 2.0 clients. Going forward, this CSP views such practices as essential in its quest to rapidly respond to new market opportunities, to explore new potential revenue streams, and to extend its market reach with finer grain targeting of select service offerings.

Evolve to Optimized Operations

The SPDE 3.0 service runtime support and information management domains allow CSPs to capitalize on dynamic process integration and information management capabilities. It involves SOA-based integration of various business processes using IBM's Telecom Operations Content Pack. This consists of approximately 150 pre-built business processes addressing the assurance, fulfillment and billing functions using the TMF NGOSS definitions including eTOM, TAM, SID, OSS/J and MTOSI. The content pack assets are then pre-certified, tested, and supported on IBM's middleware layer.

Beyond process integration, the SPDE 3.0 approach also paints a course for CSPs to capitalize on customer and product/service information using master data management, information integration, and business intelligence functions to optimize their businesses. This is a journey as shown in Figure 6 below. Creating an "Information Agenda" now is critical for CSPs to leverage their information (customer, product, service, and network) as a strategic asset in establishing and sustaining competitive advantage.

Figure 6 – Focus on Business Optimization is Accelerating



Source: IBM

Business optimization examples include the following:

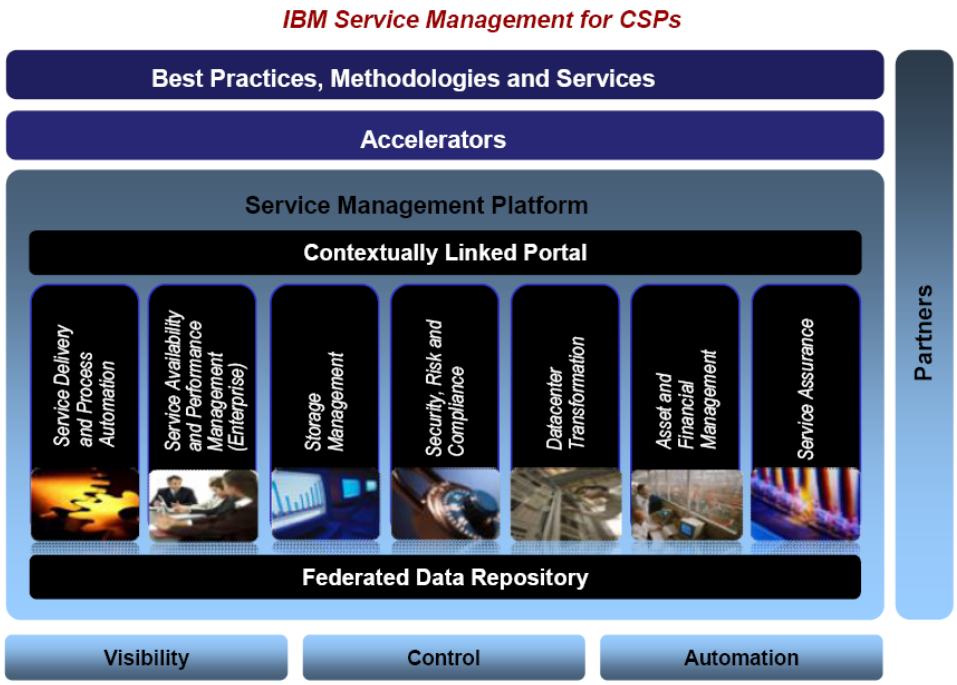
- **Delivering Innovative Services with Greater Speed and Quality** – Since implementing SPDE 3.0 a large European mobile operator has reduced the time required to integrate and deliver new services to its target market by 64%. By using a common platform and service bus, this CSP also expects a 19% reduction in the total cost of ownership over five years. This cost reduction includes several points: software license and maintenance, hardware, new service startup costs, implementation, business model change, and Enterprise Service Bus (ESB) maintenance.
- **Integrating New Services with Existing OSS/BSS** – Reusable integration templates (IBM Telecom Operations Content Pack) applied across services and channels reduces order-to-cash delays, reduces fall out, and improves customer satisfaction. An Asian mobile CSP used a portion of SPDE 3.0 to construct a flexible service-oriented architecture. Using that foundation, this CSP was able to broker approximately 5,000 messages per day between previously siloed OSS/BSS. The solution cut average problem resolution time from two days to less than one hour, helping to boost customer satisfaction levels. An Eastern European CSP also uses a SPDE 3.0 configuration to accelerate provisioning time for new subscriber services from several days to several minutes using existing OSS/BSS.
- **Unlocking the business Value of Information to Create Competitive Advantage** – By creating and maintaining an accurate view of the customer, other business units can utilize the data to determine offers and discounts or insert advertising. Meshing customer, service, and network information enhances the ability to define, deliver, and support new revenue generating services. A South American CSP implemented a data warehouse solution based on IBM DB2 Warehouse. The resultant data warehouse contains more than five years of

information and supports most of the CSP's key business processes, including marketing, financial, commercial and network systems. The system uses advanced data mining techniques to identify the most profitable customers and predict payment delays. Since the data warehouse has been in place, this CSP reports it has avoided revenue losses of approximately $4 million per month.

Differentiate the Customer Experience

The SPDE 3.0 framework is designed to improve the customer experience by offering multiple capabilities and functions in service management and security. As shown in Figure 7 below, IBM's SPDE 3.0 Service Management offering can address a number of different functions.

Figure 7 - Optimize Service Quality and Focus on Customer Value



Source: IBM

The three aspects of this strategy rest with visibility, control and automation as defined by the following:

- **Visibility for Improving Service Quality and Customer Retention** – SPDE 3.0 service management solution provides: end-to-end visibility of services across multiple network and IT technology domains; delivers a visual link between customers, infrastructure and SLA definitions; provides instantaneous notification of any SLA violations; monitors for service quality through Key Performance Indicators (KPI) and Key Quality Indicators (KQI); and can pinpoint service-affecting events and the impact such events will have on service availability and quality.
- **Control to Maximize Return on Assets and Reduce Risk** – SPDE 3.0 service management solution offers: monitoring of all network/IT assets (IT data center operations, mobile base station utilization and network node capacity) for maximizing usage and

identifying unused capacity; improvements in labor efficiency through combined helpdesk support for network, IT and even customer needs; improved governance and compliance through single sign-on and authorization by network or operations asset type/function; and manage the explosive demand for data storage tied to content-based services.

- **Automate and Streamline Management Processes to Accelerate Growth** – SPDE 3.0 service management solution supports a number of business needs including: a single view of events and management details from both new and existing service assurance tools to reduce complexity and deliver a more effective means for isolating problems; tracks more than 100 million events per day; correlates this data and reports on top-end issues for operator resolution; and monitors end-to-end business processes to identify issues and business challenges.

Industry progress within the service management and security domain, especially with regard to differentiating the customer experience, include the following CSP case examples:

- **Preventing and Responding to Security Threats** – With more services in use by more customers, the risk of compromise is significant. SDPE 3.0 provides the ability to secure applications, services, and service access while managing users and service usage changes. This includes federated identification and secure portal integration. For example, by using the IBM DataPower Appliance as the front end of a Web Services Gateway, a North American operator was able to expose services to subscribers and partners while also ensuring security. The IBM DataPower appliance provides authentication, authorization, and audit functions in addition to content-based routing utilizing digital signatures and encryption features, validation of schemas, and protection against malicious attacks. The deployment is clustered in the CSP's wireless network.
- **Improving Quality of Service and Reduce Customer Churn** – Real-time end-to-end network and services visibility allows CSPs to maximize utilization of existing assets while ensuring security and survivability. As a means for proactively delivering high quality voice and data services, a European mobile CSP presently utilizes IBM Tivoli Netcool to monitor business and consumer services across its mobile infrastructure. The ability to manage its network in real time and anticipate problems is a key differentiator for this operator in reducing the level of customer churn. Automated event correlation and analysis has reduced the number of daily events from 20,000 to 4,000 and subsequently reduced the resources required to manage the network by a significant level. Through this approach the NOC staff gains a better understanding of the impacts of service degradation, resulting in executing trouble resolution processes aimed at addressing critical customer-affecting problems first.

Stratecast
The Last Word

Network technology advances and mobile user device evolution have enabled a new generation of complex customer services making up today's "real time" world. These services compel CSPs to transform many of their business processes to recognize systems functions—within customer care, billing and provisioning especially—as a working part of each service. They are also ushering in a new generation of business models that look to deal with customer lifestyle needs first, then on how these needs impact the content, service, application, and network layers. Most importantly, customer lifestyle services are placing requirements on current business processes and installed systems they were never designed to address, especially regarding capabilities tied to real time verification, validation and notification.

From managing evolving requirements to accelerating and delivering change, a collaborative customer data and product/services lifecycle management platform such as IBM's SPDE, creates consistency and continuity of software processes, data, and delivery. **Stratecast believes business transformation requires not only flexible systems but also an automated means for adjusting business processes and the work tasks that will be completed by human resources. It further requires dedication to better response time from applications, more effective generation and notification of customer usage charges, rapid assimilation of service enablers to meet unique customer needs and near real-time settlement with partners to name just a few. A CSP's OSS/BSS environment can no longer provide passive support; it must be part of the new wave of customer service offerings. Beyond this, harvesting the richness of network, product, service and customer data to optimize business performance can no longer be ignored if competitive positioning and new revenue generation are now major imperatives for long-term success.**

SPDE 3.0 has proven it is possible to transform the way CSPs conduct business to a new tightly integrated approach involving network technology, OSS/BSS, business processes, and customer data working in an "interactive and fully dependent relationship". Such business redirection has yielded several business benefits including reduced cost of operations, improved customer satisfaction, scalability sufficient to meet the demands of rapid subscriber growth, and enablement of new business models in the ever-changing communications marketplace. It follows logically that as the converging communications market continues to advance, so will the capabilities IBM brings to bear through its SPDE-based solution strategy.

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