CSG SINGLEVIEW

UNIFIED CHARGING, BILLING, REVENUE AND CUSTOMER MANAGEMENT

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The industry is changing fast and next generation fixed and mobile networks already suggest limitless product and service possibilities.

The flexible, modular capability of CSG Singleview—the world's most advanced real-time, charging, billing, customer and revenue management system—helps operators respond quickly and seize the fast lane in the competitive race of today's telecom market.

Developed to address the needs of communication companies worldwide, CSG Singleview is helping many of the world's best known operators, including AT&T, Deutsche Telekom, Tele2, Virgin Mobile, Orange and '3', to build efficient, profitable operations with a strong focus on world-class customer care.

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CSPS ARE ON THE RIDE OF THEIR LIVES

CHANGE ISN'T COMING—IT'S ALREADY HERE

Communications advancements of the past decade fundamentally changed society, evolving at a breakneck pace how we communicate, work, and play. We work from our smartphones and educate across distances with online video. We monitor livestock's eating habits with connected devices and play games with friends on other continents. The decade yet to come will bring about even more challenges for CSPs who, having come this far, must remain competitive with both traditional and new players, with costly technology advances and crucial service innovation. They must attract and retain an increasingly discerning customer base while simultaneously reducing costs to keep pace with shrinking margins.

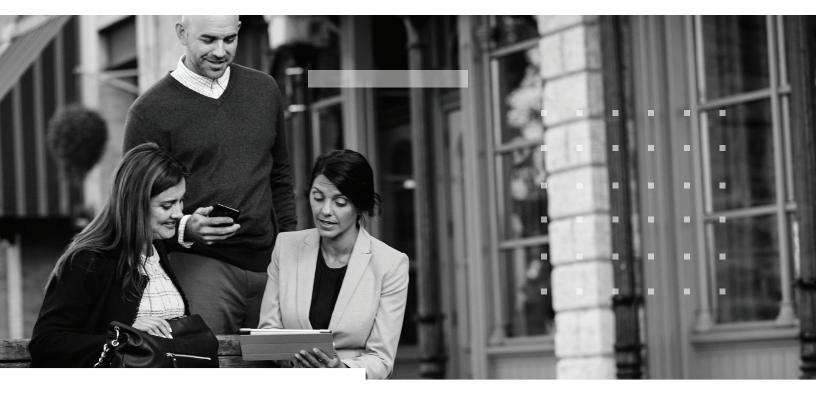## YOUR CUSTOMERS DEMAND THE BEST EXPERIENCE ANYTIME, ANYWHERE

CSPs have both the opportunity and the capacity, with today's technology, to personalize customer relationships, whether matching the seemingly limitless consumer demands for data content and services, or ensuring that complex business and enterprise customer needs are well-served. Each of these opportunities will strain a CSP's customer dealings in different ways—from creating personalized offers in real time to consumer markets of one, to managing enterprise customers with hundreds to thousands of relationships that cascade from B2C, B2B, and B2B2x business models. This will require increasing process agility, go-to-market pricing and bundling flexibility, and precision insights across all operations, from customer care to network management, from charging to revenue management, from content to partner management and beyond.

EVOLUTION COMES AT A PRICE, AND YOU NEED TO FOCUS ON REVENUE GROWTH

With the intensified rollout of fiber and 5G networks for fixed and mobile connections, CSPs can deliver innovative services across devices and across the world.

One of the most oft-cited drivers for IP, 4G/LTE and 5G network upgrades is the reduced cost of network operations per unit of bandwidth enabled. But the days when more network capacity meant more paying customers are long gone. Beyond the network, the CSP must enable increasing automation and agility across its business operations. This demands real-time, highly available solutions, from customer management, service management, policy management and revenue management, delivered on commodity hardware platforms or in the cloud, and extensible to support the traditional services of yesterday as well as the digital revenue-generating models of tomorrow.

IT'S TIME TO CREATE NEW OPPORTUNITIES

Third parties, including advertisers, content and value-added service owners are critical components in the bundles and service options that you can deliver. Servicing these partners efficiently and with fine-grained market insights opens up even more revenue streams.

Other industries are increasingly looking to CSPs to provide leadership and technical expertise to deploy connectivity-based solutions, including IoT solutions that will evolve their services. Across industries as diverse as education, health care, transportation, utilities, security and financial services, CSPs are being asked to package technical leadership with underlying connectivity to best serve those who need it.

REVENUE ENGINES	ENTERPRISE	CONSUMER
B2B2x	M2M	Own-Brand OTT
Monetization	Cloud	Alternate Roaming
MVNE	BYOD	Sponsored Data

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BUILT FOR ANY BUSINESS MODEL

Singleview helps CSPs quickly monetize and manage communications services from a single platform, accelerating time to revenue and reducing total cost of ownership. CSPs around the globe rely on Singleview to manage growth in their consumer, business, and enterprise segments, in wireless, wireline, broadband, cable, satellite, IPTV, ISP, and IoT and M2M domains. The world's leading financial and telematics service providers use Singleview to expand their offers to users and partners alike. Managing transactions across this dynamic collection of industries makes Singleview the optimal engine for enabling your evolving business models.

→ **Singleview for consumers:** Communications services spending is on the rise, but it's increasingly with third party providers. Many CSPs are modifying their offers to include content and services from third parties, and letting their customers manage access and service quality on their own terms. Singleview flexibly expands to bundle digital services into your traditional catalog, and delivers the real-time charging and policy required to put the customer in charge.

→ **Singleview for enterprises:** Businesses want to deploy communications services to increase productivity in their organization. Singleview helps you build cloud offers, support machine-to-machine use cases across industries, and manage "Bring Your Own Device" policies, including the ability to separate costs and controls between business and personal use of the same device.

→ **Singleview for digital services:** CSPs want to increase revenue from digital services, but the owners of these services tend to bypass CSPs and go to customers directly. CSPs can succeed if they collaborate with service owners. Singleview calculates charges for multiple parties through its Transaction Engine, making it the ideal solution for digital CSPs and rights owners to partner, rather than compete, to deliver content and value-added services.

→ **Singleview for IoT:** The growing dominance of IoT requires a focus on efficient, automated management of devices while delivering the quality service to users. While managing the burgeoning volume of traffic records associated with IoT communications, Singleview extracts value for all players in the complex IoT value chain.

→ **Singleview for cloud:** CSPs are a natural fit to offer infrastructure management, development platforms and applications in the cloud, as long-time providers of network connectivity and services. Singleview's flexible transaction engine extends to cloud services that require SLA-based charging and billing calculated on new technical attributes, including infrastructure and other resource utilization.

→ **Singleview for resellers and other third parties:** Third parties such as resellers, MVNOs and VARs present a valuable source of revenue for CSPs. Singleview's multi-tenancy capabilities provide access to the system for non-traditional organizations and partners that need customer management capabilities to operate their business. Offering "BSS in the cloud" provides these third parties with sophisticated functionality they could not normally afford or manage.

TAILORED TO YOUR BUSINESS

CSG Singleview provides comprehensive customer, convergent charging, billing and revenue management from a single policy, rating, charging and billing engine. The solution's unified architecture means Singleview can handle any type of pricing or business model, increasing efficiency and lowering TCO. High throughput, low-latency solutions help your business scale horizontally and vertically as you support new business offerings and services.

	CONFIGURATION STUDIO	BUSINESS & ADMINISTRATION	POLICY MANAGEMENT
Singleview	Single pane of glass for Singleview configuration	Business user interface	Policy and charging function (PCRF)
	Integrated version control and confirmation management	Create new offers, bundles and pricing	Data service policy management
		Drag and drop	Embedded self-care
		Intuitive wizard-based tool	

	CUSTOMER MANAGEMENT	CONVERGENT RATING & BILLING	COMMERCE ENGINE
Singleview	Campaign	Real-time and batch rating	Real-time authorization
	Prospect management	Cloud and partner subscriptions	Dynamic account selection
	Order entry	Billing and invoicing	Balance and multiple quota management
	Contact management	Accounts receivable	Session and event charging
	Customer care	Treatment	

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SINGLEVIEW CONVERGENT RATING & BILLING

Design, deliver, rate and bill for the products and services that customers want today—and in the future. Built upon a central Transaction Engine, Singleview helps you launch new offers rapidly and charge any transaction, group of transactions, service or bundle, with no constraints on which parameters will determine your charging and billing rules.

Gain a consolidated view of your customers' spending across all service types, and support a wide range of payment and billing options for you and your customers, allowing you to optimize both the customer experience and your revenue streams. Prepaid, postpaid and pay-now accounts— for individual users or across complex business hierarchies—are managed end-to-end from set-up, charging, billing, payment processing, debt collection and revenue recognition. Singleview automates this process, increasing efficiency and ensuring accuracy and auditability across your business.

SINGLEVIEW CUSTOMER MANAGEMENT

Singleview Customer Management is a contact center application delivering a real-time, 360-degree view of customer and service information. Singleview Customer Management supports order-to-cash processes across all customer activity from prospect management and sales support to post-billing support, issue resolution, and treatment and collections management.

Deploy the low-risk CRM solution with Convergent Rating & Billing in a single installation, single database and common operating environment, minimizing the cost and time to deploy. By leveraging a common database across modules, you can minimize operational costs, data synchronization issues and risk, while increasing accuracy and efficiency. Customer Management delivers business processes designed to meet CSP requirements. Singleview Customer Management can cut contact center handling times, increase customer satisfaction, and improve workflow efficiency.

SINGLEVIEW COMMERCE ENGINE

In today's highly competitive market, it is essential for CSPs to eliminate the distinction between prepaid and postpaid and offer the same level of services and real-time credit management regardless of payment method. Offer services though a convergent transaction charging framework for all accounts, regardless of payment method, through a single rating engine and customer care system. Commerce Engine enables real-time, low-latency and high-availability transactions between the billing system and the network. This enables CSPs to lower operational costs by removing the barriers—and billing infrastructure silos—between service types.

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SINGLEVIEW CONFIGURATION STUDIO

Configuration Studio is an Eclipse-based Integrated Development Environment (IDE) used to match Singleview with your business rules and data definitions. Create and maintain specific business rules via an easy-to-use extensible configuration platform. A BPMN editor is also included for workflow definition.

SINGLEVIEW BUSINESS & ADMIN STUDIO

Specially designed for your marketing team, Business & Administration Studio lets your team quickly update pricing and create new bundles in your product catalog. The application guides users through the process of creating new offers and bundles through a drag-and-drop interface.

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CONQUER CONVERGED MARKETS

MULTIPLE MARKETS, ONE SYSTEM

Singleview is designed to support the convergence of all service types, media and subscription models within one solution. Singleview eliminates coding and complexity, letting you focus on the market and new business models like IoT and enterprise. The solution's flexibility means you can provide the content that customers demand in a timeframe that doesn't just follow market pace, but drives it.

Many evolving communications business models are based on new and emerging digital services, as well as non-traditional relationships with third parties. Managing the service, financial and reporting hierarchies within companies, across individuals and partners, and increasingly among "things," Singleview administers both revenue growth across your customer base and efficient revenue sharing across your partners.

SINGLEVIEW SUPPORTS GROWTH

Singleview responds to next-generation business model requirements, letting you:

→ Rate and charge for any type of transaction, in real time or batch

→ Apply sophisticated discounting and bundling offers

→ Manage financial contracts

→ Apply treatment and collections

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→ Use sophisticated modeling, including "one-off" or individual case basis agreements

→ Use flexible settlement and revenue recognition capabilities

→ Charge and settle with all parties as appropriate for the particular business model

→ Apply flexible order entry and workflow capabilities to address any sector

→ Offer 'bill on behalf of'—providing billing as a service

MANAGE CHARGING AND BALANCES IN REAL TIME

Real-time convergent charging is a critical part of today's communications offers and business models. Real-time authorization and accounting of customer activity minimizes revenue leakage, with rated transactions to account balances ensuring balances are always current.

Through Commerce Engine, Singleview enables real-time interactions between the billing system and the network, providing:

→ A convergent transaction charging framework for postpaid, prepaid and hybrid accounts

→ Interactive and real-time service authorization and accounting

→ Concurrent account usage to allow multiple devices and services to draw on the same account

→ Dynamic account selection to allow subscriber control over which account charges are applied to

→ Customer-controlled budgets to allow subscribers to specify service and account-specific spending limits

→ "Advice of charge" to allow a subscriber to determine the cost they will incur for an item of content, prior to initiating a transaction

→ A convergent transaction charging framework for postpaid, prepaid and hybrid accounts

→ Interactive and real-time service authorization and accounting

→ Real-time rating, where an event is rated and the account balance updated with no perceived delay

WITH SINGLEVIEW, ANY CSP CAN GO GLOBAL, WITH BILLING AND REVENUE MANAGEMENT PROCESSES CONSOLIDATED OR SEGREGATED AT ANY LEVEL, IN ANY LOCATION IN A SINGLE ENVIRONMENT.

IMPROVE THE CUSTOMER EXPERIENCE

Handle Customers with Care

Through its integrated Customer Management, CSG Singleview provides a 360-degree view of customer activity and simplifies your customer interface for customer care, service delivery and billing.

→ Efficient order entry, problem handling and defined workflows lower call handling costs and wait times

→ Assured follow-up and quick responses to inquiries help you increase customer satisfaction

→ Real-time up-sell, cross-sell and churn identification ensure proactive revenue optimization

→ Effective campaign management and analysis helps the process of subscriber acquisition and retention

→ Collections capabilities manage the treatment of customers through the process of communicating with delinquent accounts and provide the complete workflow to ensure maximum payment

→ Comprehensive channel and dealer relationships support, including dealer hierarchy and contact management, is coupled with input to external Accounts Payable systems for ease in settlement of commissions

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Maximize Collections, Minimize Risk

Singleview proactively manages tracking and processing of overdue accounts, enabling you to easily identify customers in treatment and manage the associated risk.

Since customer retention is essential, especially for customers without a treatment history, recovery steps can be tailored to minimize customer dissatisfaction. Promise-to-Pay functionality suspends treatment and establishes a payment plan so that the customer can avoid disconnection. And because no customer-centric operation can avoid disputes, an arbitration workflow manages customer-disputed charges, enabling line items to be disputed without penalizing the customer for making valid inquiries.

Efficient Contact Center Operations

Singleview's web-based interface for your contact center agents ensures reduced training times, lower call handling times, efficient users and, ultimately, delighted customers. Singleview Customer Management processes are designed with a "three-click" rule, so your contact center staff are more efficient from the outset. And with the integration of Customer Management and Convergent Billing, detailed account and billing information is instantly available to the CSR, accelerating responses to callers' questions, capturing payments or adjustments and updating all activity on the account record from a single common interface.

Singleview Customer Management's workflow engine delivers high-quality, cost-effective issue resolution by managing follow-up activities. All customer interactions, regardless of their complexity, are tracked and reported. Configurable, automated business procedures, including escalation policy management, ensure that agreements regarding task deadlines are met.

With zero-software desktop installation or upgrades, Singleview delivers reduced rollout, administration, and support costs. Client workstation requirements and hardware requirements are minimized. And the Singleview server runs on commodity hardware and operating software, representing considerable cost savings over standard UNIX servers.

POLKOMTEL

"BY CHOOSING CSG SINGLEVIEW, POLKOMTEL IS EMBRACING THE CONVERGENT BUSINESS MODEL THAT WILL ENABLE US TO MAINTAIN A COMPETITIVE EDGE OVER OUR RIVALS AND TO REINFORCE OUR POSITION AS A TRUE TECHNOLOGY LEADER IN POLAND. IT ALSO WILL INTRODUCE OPERATIONAL AND COST EFFICIENCIES."

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EFFICIENCY MEETS OPERATIONS

Speed Up Time to Revenue

Optimize your order-to-cash business processes and financial assurance controls through active monitoring and error event management. Singleview identifies and flags incorrectly rated events within an active billing cycle before finalizing invoices, allowing you to correct or extract error data from the process. You can reprocess error events at the source while enabling the active bill cycle to complete for non-impacted data and customers. In addition, Singleview creates and maintains historical market segmentation, product billing, and customer care information to feed into product lifecycle management processes.

Accelerate Revenue Recognition

Singleview delivers a fully automated and integrated revenue recognition engine to power the timely and accurate reporting of earned and unearned revenue to your financial systems. Configure accounting rules and automate the journalization of every billing-related event through its lifecycle in the correct reporting periods and in the correct proportion. The application of payments, disputes or adjustments is automatically journalized through the same engine, delivering meaningful information about the financial performance of your revenue-generating assets for analytic, financial accounting (GL) and managerial accounting uses.

Internationalization

Growth and expanding business models frequently involve crossing national boundaries. Singleview supports multi-currency and tax requirements, multiple languages, calendars, time zones, and regulatory rules, enabling deployment in multiple countries. With Singleview, any CSP can go global, with billing

and revenue management processes consolidated or segregated at any level, in any location in a single environment—without the operational burden of managing regional software configurations.

Optimize Your Architecture

Singleview's architecture delivers high-throughput, low-latency transaction processing support for the flexible and rapid deployment of new high-volume data services. Support end-to-end customer and revenue management of every service, both traditional and next-generation, in a convergent manner. And because customers expect to interact with their service provider 24/7, all necessary aspects of Singleview are supported in a high availability environment.

Deployed as an integrated, adjunct solution for next-generation network and content services, or as the engine for your transformation, Singleview delivers flexibility to your BSS. And all of Singleview's flexibility is delivered on top of pre-defined information models and business processes that are certified as conformant with TM Forum's Frameworx best practices.

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SINGLEVIEW FUNCTIONS MAPPED TO TM FORUM'S TAM (TELECOM APPLICATION MAP)

CROSS DOMAIN - FALLOUT MANAGEMENT, CATALOG MANAGEMENT

MARKETING/ SALES DOMAIN	PRODUCT MANAGEMENT DOMAIN	CUSTOMER MANAGEMENT DOMAIN	SERVICE MANAGEMENT DOMAIN	RESOURCE MANAGEMENT DOMAIN	SUPPLIER PARTNER DOMAIN
Campaign & funnel management	Product catalog management	Case management	Service order management	Resource inventory management	Partner management
Sales account management		CSR toolbox		Network number inventory management	Wholesale/ interconnect Billing
Channel sales management		Bill format/render		Usage management	
Solution management		Charge calculation and balance management			
		Customer contact management, retention and loyalty			
		Billing inquiry dispute and adjustment management			
		Customer order management			
		Receivable management			
		Billing account management			
		Collection management			
		Billing events management			
		Bill calculation			
		Customer problem management			
		Transactional document production			
		Customer information management			

INTEGRATION INFRASTUCTURE

Lower Operational Costs

CSG Singleview lowers your operational costs by increasing the efficiency of your customer and revenue management processes. Our unified billing and customer care architecture streamlines the management, aggregation and extraction of valuable billing and customer care data for use across your business, reducing costly manual processes that hold back your business. Simplify work flow tasks and avoid errors caused by inadequate processes, freeing up valuable time and resources.

Singleview is designed to grow with your business, at a pace that suits you. Start with a predefined solution compatible with today's operational systems. React quickly as your business requirements evolve. The four-tier application architecture allows the system to adapt to changing business needs, something other software systems can't offer. This same architecture enables scaling to support real-time rating and billing transaction services, reports, and batch interfaces.

High availability is a key requirement for any real-time enterprise for service provision, customer satisfaction and financial management. CSG Singleview's architecture is highly available to support your business 24/7, and allows you to perform upgrades and changes without any loss of function.

Singleview dramatically reduces billing cycle overheads with a comprehensive combination of task automation, quality controls, user alerts and resolution workflows when out-of-boundary conditions are encountered. CSG Singleview's comprehensive, TM Forum (TMF) Frameworx-certified capabilities enable you to achieve dramatic process improvement and efficiency gains through access to key tools and data, making data input more efficient and analysis more relevant.

Work with Other Systems

Singleview is available as a wholly integrated solution or in modules, letting you design a BSS solution that works for your business. Implement the modules you need now, and add the rest later without worrying about integration now. Singleview can be implemented in its entirety, in parts, at the same time, or in stages.

Singleview interoperates with third-party applications throughout your OSS and BSS, eliminating integration risk and cost. For integrated business processes and synchronizing data across other systems, Singleview's Transaction Engine exposes entity level and business level functions through a pre-defined but extensible API library. For inbound or outbound integrated processes, Singleview's API library exposes every process and data element through SOAP and REST web services protocols, supporting individual touchpoints, predefined interfaces or custom-built interfaces for your specific BSS environment.

Singleview processes your current and future transaction volumes through:

→ Effective addition of incremental server hardware beneath a common processing environment and billing database

→ Maintaining performance levels and delivering near-linear scalability as data volumes increase

→ Targeted allocation of CPU power to support specific business rules and processes as needed

Whether through benchmarks conducted at industry labs or at customer installations, Singleview delivers consistent results and clearly demonstrates the capability to process the large data volumes of tomorrow. Singleview's n-tier architecture employs a world-class transaction engine, ensuring a robust, scalable system with high performance. And with deployment options on UNIX platforms as well as commodity software/hardware, Singleview delivers scalability while minimizing your CAPEX investment.

SINGLEVIEW: WHAT'S NEXT FOR YOU

Whether your organization is on the leading wave of new business models, leaping into new network technology with gusto, or just dipping a toe into the pool of new opportunities, CSG Singleview helps you make the most of your investments in networks, in people, in processes and technology. With Singleview, you can lead the monetization of LTE networks, the rollout of premium content to consumers, the establishment of M2M use cases across industries, and the advancement of your enterprise customers with cloud service. You can achieve all of this with Singleview as an enabler for a single next-generation service or as the foundation of your business transformation.

XO COMMUNICATIONS

"CSG SINGLEVIEW ENABLES EASY DEVELOPMENT OF NEW PRODUCT PACKAGES TAILORED TO THE SPECIFIC NEEDS OF OUR CUSTOMERS, SO WE CAN DECREASE OUR TIME TO MARKET AND ACCELERATE THE TIME TO REVENUE."

ABOUT CSG

For more than 35 years, CSG has simplified the complexity of business, delivering innovative customer engagement solutions that help companies acquire, monetize, engage and retain customers. Operating across more than 120 countries worldwide, CSG manages billions of critical customer interactions annually, and its award-winning suite of software and services allow companies across dozens of industries to tackle their biggest business challenges and thrive in an ever-changing marketplace. CSG is the trusted partner for driving digital innovation for hundreds of leading global brands, including AT&T, Charter Communications, Comcast, DISH, Eastlink, Formula One, Maximus, MTN and Telstra.

To learn more, visit our website at csgi.com and connect with us on LinkedIn and Twitter.

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