



CSG DIGITAL WHOLESALE

CONNECTING TO THE FUTURE





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Few markets are as competitive or as fast-moving as wholesale telecom. With players and partners constantly in flux, future profits hinge on your ability to adapt to new technology and quickly respond to new business opportunities.

CSG Digital Wholesale is an integrated suite of partner settlement-oriented products designed to

make you a more efficient and profitable enterprise—in control of your wholesale business, and responsive to the change from communications service provision to digital service provision.

CSG Digital Wholesale helps you maximize your ROI not just with neighboring networks, but with the rest of the world.



WHY SHOULD YOU CARE ABOUT WHOLESALE?

1. BECAUSE NO NETWORK IS AN ISLAND.

Your network doesn't stop at your national boundaries. Your responsibilities don't end with your network. Customers see you as the carrier for everything they do on their devices, regardless of source or destination. To provide world-class service, you need to adapt to the market and to changes in the quality of service provided by your partners.

2. BECAUSE YOUR INTER-CARRIER BUSINESS DRIVES REVENUE.

Inter-carrier call traffic is a huge source of operator revenue. Other kinds of partner-dependent services, such as third-party video content, are creating new streams of revenue and opportunities for differentiation. Partner settlement and interconnect—all of the business that you do with other operators and enterprises—continues to be a vital part of the telecom business.

Inaccurate billing, lengthy disputes and fraud can all result in denied or delayed revenue, with a real impact on profit and cash flow. Poor quality of service—

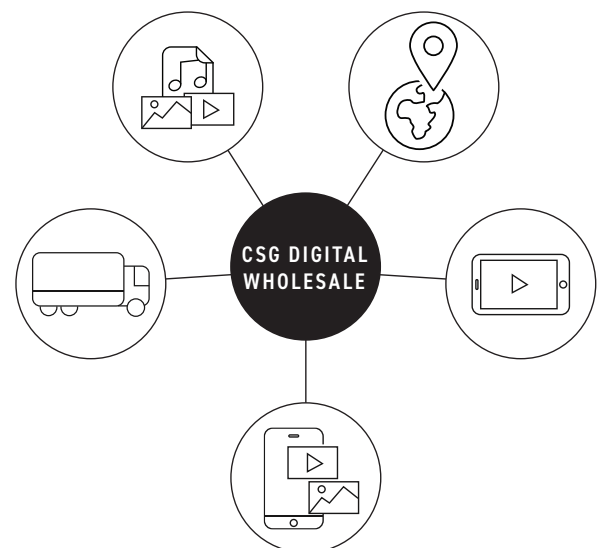
whether on your own or on other networks—can mean unhappy partners and customers, and lost revenue from both.

3. BECAUSE TELECOM ISN'T JUST ABOUT CALLING ANYMORE...

While inter-carrier call traffic is a huge revenue generator, other partner-dependent services like third-party content and downloadable apps help differentiate service providers. New revenue will come from the delivery of third-party content and services, and these will require settlement with new kinds of partner. Other revenue won't come directly from subscribers at all, but from joint ventures that deliver through the cloud, through the Internet of Things (IoT) and other technological innovations. Success in these future markets will directly depend on how efficiently and flexibly you can collaborate with strategic business partners to exchange information.

ANALYSYS MASON

"INTERCONNECT COSTS ARE SIGNIFICANT FOR THE AVERAGE CSP—TYPICALLY GENERATING BETWEEN 25-60% OF SOME CSP'S REVENUES AND ACCOUNTING FOR A SIMILAR PROPORTION OF COSTS FOR OTHER TYPES OF CSP."





A PRACTICAL, PROVEN SOLUTION

CSG Digital Wholesale brings control, power and insight to your connected business. Using CSG Digital Wholesale, you can,

- Monitor traffic and content passing in and out of your network
- Apply accurate and mutually agreed charges, and settle quickly with other businesses
- Understand what your customers are doing on other networks—and what other operators' customers are doing on yours
- Manage the way you route traffic to foreign destinations—checking costs, quality, and other variables that may have a significant impact on margins
- Check that you—and your customers—are getting the quality you pay other carriers for, and that you are not being defrauded of revenue for incoming calls
- Handle very high volumes of data in close-to-real time to support IoT and partner opportunities
- Run your wholesale business efficiently, automating the exchange and upload of data between you and your partners



BRINGING THE WORLD'S LEADING WHOLESALE BUSINESS SOFTWARE TO EVERY CARRIER

CSG Digital Wholesale is the world's most widely-used and widely-proven partner management software. License it directly to manage and run yourself, or let us host and run it for you as a cloud-based application. This gives you immediate, cost-efficient access to a platform of integrated products currently used across 450 networks in 150 countries, processing over 6 billion records daily. Our managed services team can also oversee your day-to-day business processes, ranging from basic systems operations to core business functions.

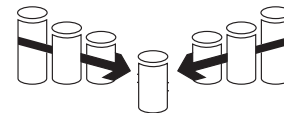


BUSINESS OPERATIONS



CSG CLOUD SERVICES

Special Delivery Network



MEDIATION PLATFORM

| | | LICENSED | CLOUD |
|-------------------|---|----------|----------|
| OPERATIONS | Business operations | Operator | Operator |
| | Platform operations | Operator | CSG |
| PLATFORM | Applications (CSG Digital Wholesale Software) | Operator | CSG |
| | Infrastructure (Hardware + 3PP) | Operator | CSG |



CSG DIGITAL WHOLESALE IN YOUR BUSINESS

CSG Digital Wholesale is a wholesale solutions platform, comprising a set of integrated products and services that can be combined to support strategically vital business functions:

- **CSG Interconnect:** Accurate and flexible solution for partner charging and settlement—the market-leading benchmark solution, against which competitors are measured
- **CSG Route:** Optimized and automated routing of international calls that analyzes cost, quality and many other variables critical to call routing and capacity trading

- **CSG Assure:** Validation of calls to and from your network, addressing fraud and ensuring that you—and your customers and partners—are getting the international call quality you paid for

- **CSG Exchange:** Automated capture, analysis and processing of partner documents, including refile and bilateral agreements, declarations and invoices

| CSG ROUTE | CSG INTERCONNECT | CSG ASSURE | CSG EXCHANGE |
|----------------------------------|---|-----------------------------------|---------------------------------------|
| TRADING AND ROUTING | RATING AND SETTLEMENT | QUALITY AND FRAUD TESTING | DOCUMENT EXCHANGE |
| Inter-operator agreement loading | Rating, adjustments and recurring charges | International carrier QoS Testing | Inbound document reception |
| Routing Optimization | Credit and dispute management | Mobile originated QoS testing | Capture data in different formats |
| Quality of service testing | EDR pre-processing | SMS testing | Data validation and error logging |
| Network provisioning | Partner agreement loading | Simbox detection | Accept/reject notification |
| Cost and pricing | Partner invoice reconciliation | Ensure Quality | Data upload into downstream systems |
| Margin management | Invoicing and financials | | Central & independent data repository |
| Optimize routes | Monetize events | | Increase Efficiency |



COMPREHENSIVE SUPPORT FOR EVERY KIND OF PARTNER

- **CSG Digital Wholesale for Domestic Interconnect:** Manage direct interactions with other national operators, calculating monies owed and owing for calls terminated and sent, and supporting reconciliation, settlement and credit management. CSG Digital Wholesale can also provide assurance that incoming, terminated traffic has not been subject to fraudulent bypass, depriving you of vital revenue
- **CSG Digital Wholesale for International Interconnect:** Rate traffic (following ITU International Settlement principles where appropriate) reconcile and settle with foreign carriers, and manage volume-based, bilateral and other agreements specific to your international business. Manage the routing of your outgoing foreign traffic, taking into account price, quality of service and other criteria to maximize margins on international calls

CSG Digital Wholesale also helps analyze the quality of call delivery to foreign destinations; this intelligence can be used to make more informed routing decisions

ANALYSYS MASON

“CSG DIGITAL WHOLESALE SUPPORTS REVENUE SHARING AND MULTI-PARTY SETTLEMENTS...”

- **CSG Digital Wholesale for Content:** Rate, settle and manage partner relationships, whether they're third-party content providers or IoT solution providers. New business innovations require working with new partners of unproven creditworthiness; automated credit and dispute management will be vital to revenue assurance. CSG Digital Wholesale supports revenue sharing and multi-party settlements, providing resilience as you move into new kinds of connections, partnerships and market propositions
- **CSG Digital Wholesale for Roaming:** Take control of strategic roaming functions like inbound and outbound roamer traffic, call rating, charge verification of outbound roamers, and reconciliation and settlement with other operators. Our roaming capabilities give you comprehensive control of high-volume, and often high-value, roaming traffic with your most strategically important roaming partners

CSG DIGITAL WHOLESALE FOR YOUR CONNECTED BUSINESS

CSG Digital Wholesale is an integrated platform of solutions that helps you manage relationships with other carriers, service providers and business partners that drive your business.

With a flexible delivery model adaptable to any size or maturity of service provider, CSG Digital Wholesale helps you profit from the new opportunities and the often very complex partner relationships that the evolving digital economy creates. Comprehensive functionality, flexibility and high performance help you streamline processes, control costs, and increase profits as you extend your service portfolio.



THE CSG DIGITAL WHOLESALE PRODUCT SET

CSG INTERCONNECT

CSG Interconnect is a wholesale billing and settlement product. Bill and settle with external business entities, with other operators, and with an increasingly wide range of other commercial organizations. CSG Interconnect provides complete operational and financial control of your business-to-business interactions with other carriers and content and service partners.

TAILORING THE SOLUTION TO YOU

Interconnect is a modular solution, consisting of a set of pre-integrated components which can be assembled and further tailored to meet your specific requirements. The solution can be delivered as licensed software, or as a managed service.

Interconnect's core functionality, supplied as standard, includes volume-based and enhanced rating features, international (ITU) settlement capability and country-specific reference data loaders. Optional add-on functions include:

- Contract management, including automated rate sheet loading
- Financial management, including management and application of tax structures, flexible invoice generation and ERP interfacing
- Recurring and other non-transactional charging (e.g. transmission links rental)
- Billing and traffic reconciliation, from aggregated to event record level
- Dispute management workflow
- Credit management, including monitoring of pre-pay agreements, credit limits, and disconnections
- Event record pre-processing

CSG INTERCONNECT

FUNCTIONS

Volume-based rating

Enhanced rating and error management

International settlement

Agreement loading

Contract management

Financial management

Adjustment and recurring charges

Automated invoice reconciliation

Credit management

Dispute management

EDR pre-processing



REALIZING A CLEAR ROI IN VENEZUELA

Telefónica Venezuela, under the Movistar brand, provides telecommunications services throughout Venezuela. The company offers fixed-line, mobile, national and long distance, and data transmission services. CSG Interconnect enabled Telefónica Venezuela to correctly settle local transportation, domestic long distance, and other charges their legacy system was unable to model. This vastly improved cost projections and reconciliations with interconnect partners.

BENEFITS REALIZED

- 8 million additional billed minutes' worth over \$850,000
- 119% increase in interconnect agreements identified accounting for \$540,000 additional traffic value
- \$7 million additional recovered revenue derived from gap analysis

TELEFÓNICA VENEZUELA

"WE REALIZED A FOUR-FOLD INCREASE IN CDRS PROCESSED PER DAY, IN A MUCH MORE EFFICIENT MANNER. CSG INTERCONNECT IS A ROBUST TOOL THAT IN TURN ENABLES A MORE POWERFUL LEVEL OF CONTROL."



CSG ROUTE

CSG Route, the most widely deployed routing and trading system in the world, with over 100 implementation projects worldwide, helps you minimize the cost of inter-carrier traffic, and more effectively manage your revenue-critical inter-carrier business.

The product combines optimized routing, dynamically selecting preferred routes based on an array of customer-configurable algorithms; automated provisioning of routing logic against all of the world's leading switch types, and a "routing desk," providing hands-on control, visibility and insight to the inter-carrier side of the business.

Improved Margin Management

The speed and complexity of today's wholesale market demands that operations are streamlined and automated. Disconnected, manual applications are no longer viable when rates and best routes can change hourly. CSG Route provides operational control of traffic trading and routing along with automated network provisioning of commercial routing orders, from a single integrated system.

TELIA COMPANY

"CSG'S TRADING AND ROUTING SOLUTION PROVIDES US WITH AN INTEGRATED TOOL TO ENSURE QUALITY, FLEXIBILITY AND ACCURACY IN MANAGING COMPLEX INTER-CARRIER RELATIONSHIPS."

PROFITABLY COMPETITIVE

The ability to react quickly to an attractive supplier offer is vital. CSG Route automatically processes and validates the price lists, rates, area codes and quality indicators offered by other carriers. It recognizes and stores each supplier's numbering plan and automatically maps the destinations, ranking suppliers and instantly identify break-out opportunities.

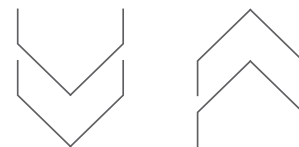
CSG Route's configurable algorithms let you define different routing strategies based on margins, rates, quality, capacity, volume commitments, traffic patterns and agreement fulfillment strategy.

Intelligent Trading

CSG Route renders tariff-setting quick and easy, automatically calculating multiple cost definitions based on actual or future routing structures and pricelists with customer-specific layouts, and supporting on-the-fly rate negotiations.

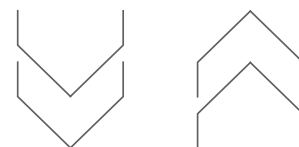
OPTIMIZED ROUTING

Flexibility - customer
Configured algorithms



ACTIVE ROUTING

Control "All-in-one"
routing desk



PROVISIONING

Adaptability. Powerful
multi-switch implementation



CSG ASSURE

CSG Assure is a managed test facility that lets you verify quality and detect fraud in your international voice traffic, improving customer and inter-carrier revenue and payback on your network investment. The solution is provided as a managed service, freeing up expert resource in your organization and providing quick ROI.

CSG Assure supports both “outbound” carrier testing, checking that calls from your network are being delivered to the expected level of quality, and “inbound” call verification using simulated test subscribers located in over 450 mobile networks.

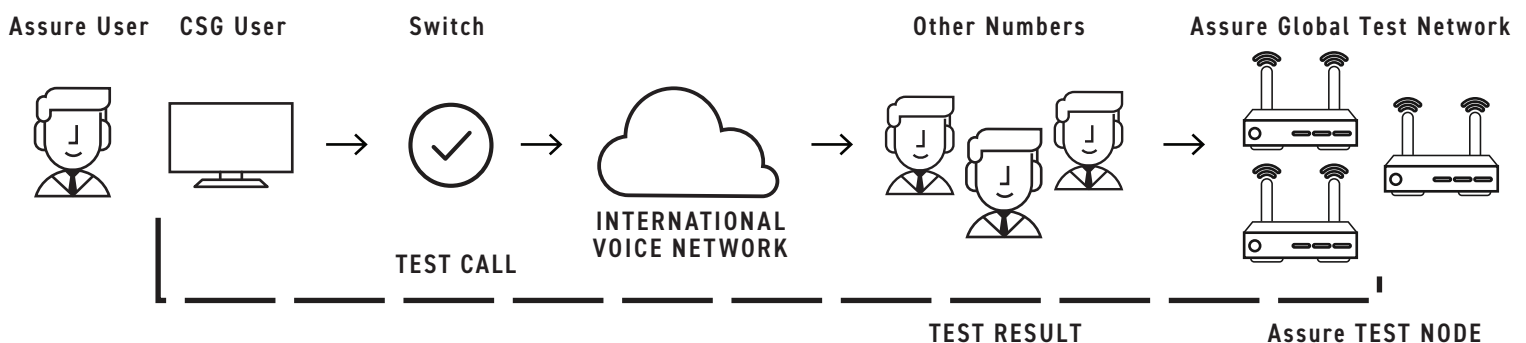
QUALITY AND QUANTITY

CSG Assure makes wholesale and termination traffic a market driven by quality, not just cost. Operators can use demonstrable call quality to attract other carriers to use their networks.

CSG Assure automates the proactive monitoring of QoS parameters and traffic scenarios not covered by traditional live traffic analysis. CSG Assure confirms that you—and your customers—are receiving the service you’re paying for.

Proven Results

CSG Assure is the leading solution on the market, currently used by four of the world’s largest carriers and over 70 carriers worldwide. It has become the de facto standard for carriers seeking to increase margin through guaranteed CLI delivery and other key quality features to international destinations.





CSG EXCHANGE

CSG Exchange automates and formalizes the management and processing of updated contractual information that an operator receives from its partners.

Today's Market Demands More Partners

It's well documented that CSPs need to innovate to survive in this rapidly changing world and that to achieve this, they need to connect to more partners offering a diverse range of services. This in turn means they have more agreements to negotiate, more information to exchange, more documents to process, more data elements to approve and inevitably more disputes to handle.

Save Time, Money and Partner Relationships

CSG Exchange simplifies partner agreement management by making it easy to bring on and work with new suppliers. The streamlined process frees valuable resources while providing automated data validations, adherence to established business rules for acceptance and rejection, and oversight and control. Respond to advantageous rates and the improved cashflow and time to revenue due to the reduction in disputes. The time to value is accelerated since the received data is ready-to-use within minutes of receipt and is automatically loaded into the system. The approved documents are maintained in CSG Exchange.

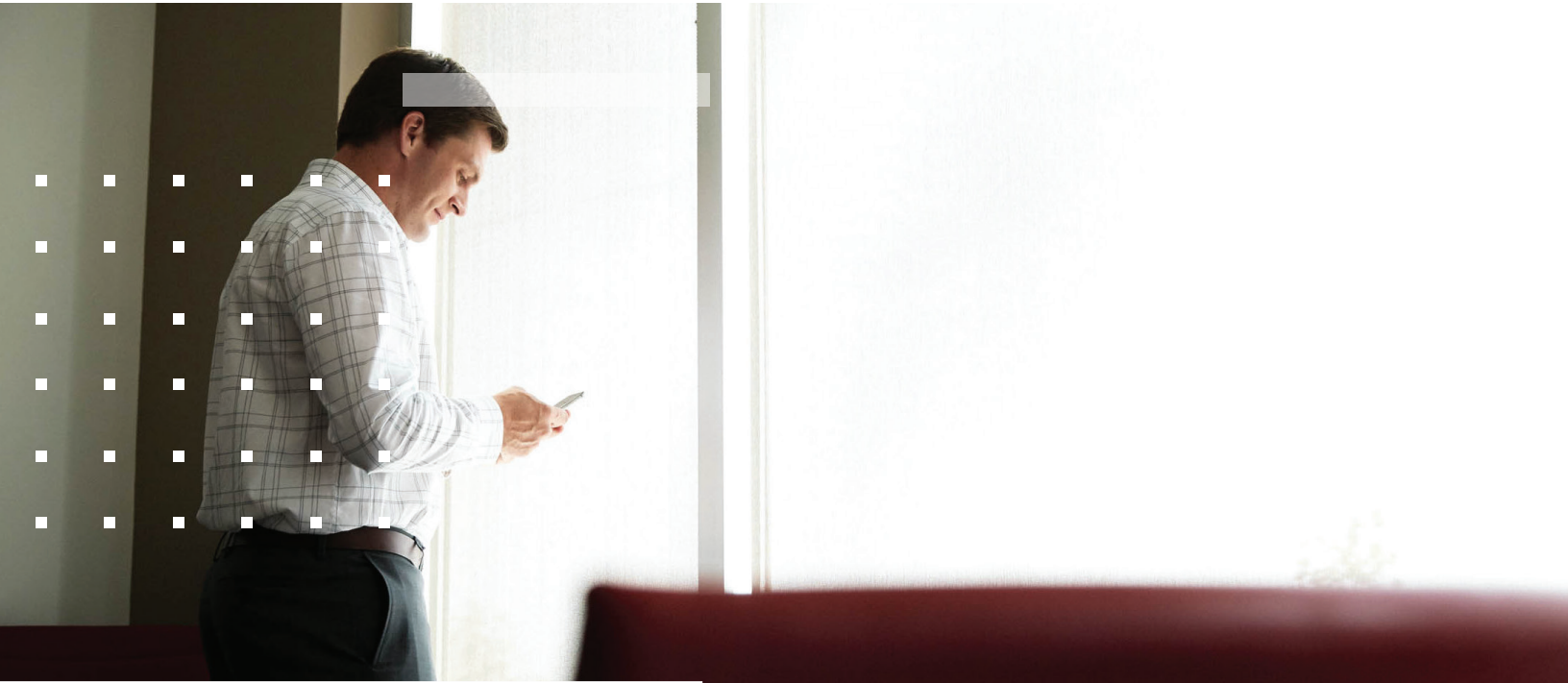
Shortening the Agreement Cycle An operator can have hundreds or even thousands of active agreements in place with their interconnect partners. Each agreement will require rate sheets, statements, invoices, dispute records and other contractual documents to be updated on a regular basis. It is vital that each change to agreed data is formally recorded and accepted to minimize contractual disputes—time-consuming work if conducted manually.

By automating and formalizing the transfer of contractual information, CSG Exchange provides rigorous control while eliminating manual processes and resource costs. Agreement and rate information is validated upon receipt, with granularity down to the line level, and all relevant parties are notified of the results. The service also provides an independent repository for all agreements which can be used as a formal point of reference during disputes with partners.

The Services of CSG Exchange

CSG currently offers the following three services via CSG Exchange:

- The Refile Agreement service automates the receipt and processing of refile rate sheets with partners. Rate sheets can be received and parsed in multiple formats, including sheets for Refile, Hubbing, Direct In/Out, and Transit In/Out
- The Bilateral Agreement service automates the receipt and processing of bilateral agreement annex sheets with partners. These sheets will be received in specific formats compliant with GBET standards
- The Invoice/Statement exchange service handles the Invoices and Declarations received from suppliers, often in a wide range of formats, including PDF and scanned documents. By automating the data parsing and validation, and then uploading the approved data into CSG Interconnect increases the accuracy of the recorded data to minimize disputes and improve payment timescales



MVNO OPTIMIZES WHOLESALE REVENUE

One of France's largest Mobile Virtual Network Operators (MVNOs) invested in a full MVNO infrastructure to better support its 1.7 million subscribers. The business was able to use networks from Orange and French telecommunications provider, SFR, for its customers. It also had the freedom to form additional domestic and international direct partner agreements including for voice, data and SMS/MMS interconnection.

WHY CSG INTERCONNECT?

The operator wanted to establish an effective partner settlement management process and optimize the wholesale revenue opportunity. CSG brought global experience and a market-leading wholesale business management solution that handles every kind of network traffic for local, regional and worldwide operators in a single, highly integrated platform.

ACCORDING TO THE OPERATOR, THE CSG INTERCONNECT® SOLUTION REALIZED A POSITIVE RETURN ON INVESTMENT WITHIN SEVERAL WEEKS OF IMPLEMENTATION BY AUTOMATICALLY IDENTIFYING AND PROCESSING PARTNER TRAFFIC PASSING THROUGH ITS NETWORK—INCLUDING COMPLEX TRAFFIC NOT PREVIOUSLY SPOTTED—THEN APPLYING AGREED CHARGES.



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 csqi.com and connect with us on [LinkedIn](#) and [Twitter](#).