



SUNGARD VALDI LIQUIDITY SOLUTIONS

The smart route to
fragmented liquidity
in Europe

THE SMART ROUTE TO FRAGMENTED LIQUIDITY

Trading in Europe's fragmented equity markets raises significant challenges. There is increasing pressure from investment institutions for their brokers to deliver true Best Execution in the multi-venue environment: in other words, to access the best prices on their behalf, wherever those prices may be quoted. Large percentages of liquidity in major index constituent stocks have moved away from the primary exchanges. The major pan-European Multilateral Trading Facilities (MTFs) offer highly competitive terms for trading and clearing, and very often the best quoted prices. The need is therefore growing to follow the liquidity to these venues.

So much is clear, but the subsequent decisions are much more difficult. Which trading venues should be prioritized, and how can you retain flexibility to adjust as the market evolves further? Every step involves new membership fees, connectivity costs, risk-management layers, smart routing configuration changes, market data processing costs, compliance (trade audit databases etc.) and the associated manpower. Almost all of these costs are fully recurring, and are largely fixed, regardless of trading volumes. And here we have considered only the front office: there is also the workload and cost involved for the middle and back offices in managing multiple CCPs and settlement agents.

The magnitude of these challenges causes a real dilemma for many firms. While trading on the new venues might be advantageous, or even a competitive necessity, how can you prevent the cumulative costs involved from eroding much or all of your trading profit margin? One solution is to outsource all smart

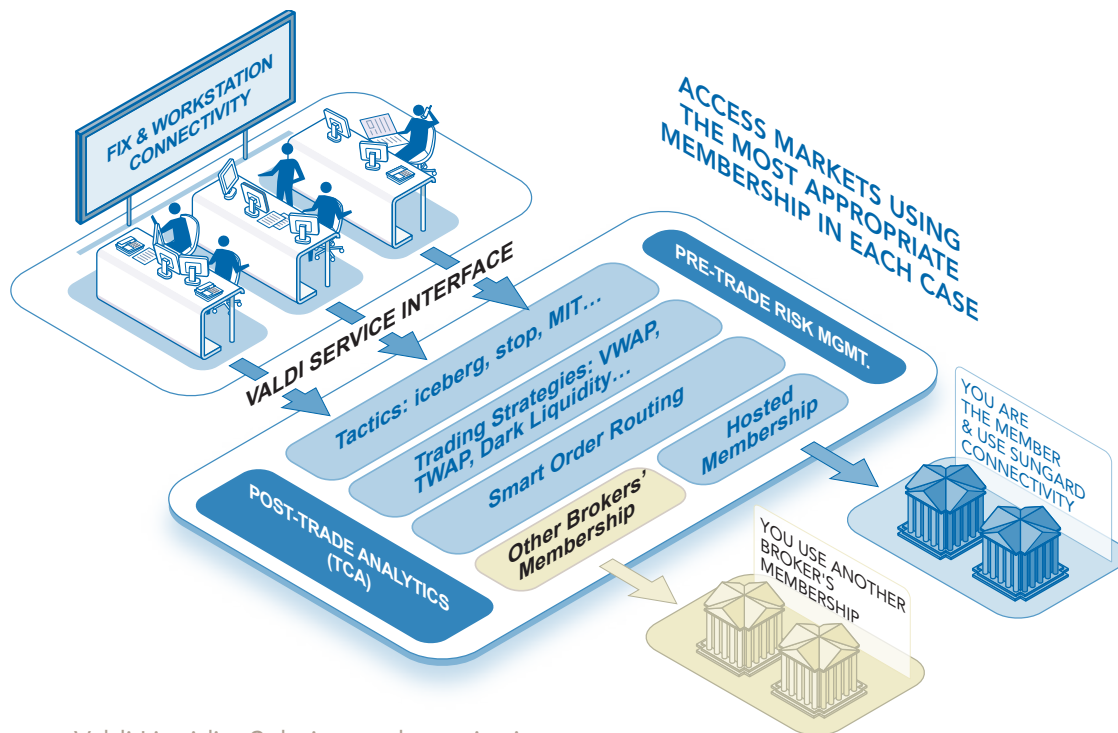
routing, executions and clearing for European markets to another brokerage house. But there are competitive business risks involved in going that route, and investments in current market memberships, connectivity etc. may be partly or wholly wasted as a result.

VALDI LIQUIDITY SOLUTIONS: THE SMART ALTERNATIVE

Valdi Liquidity Solutions provide a unique approach to managing the move to smart multi-venue execution: these services enable you to leverage fully your current client relationships, market memberships and connectivity, and at the same time take advantage of the full range of new possibilities in the fragmented markets. Just as important in current market circumstances, the way in which the Valdi Liquidity Solutions are delivered enables you to avoid much or all of the fixed cost increment that is normally involved in trading new markets.

In delivering the Valdi suite SunGard works with you, and potentially with other partner brokers, to build a flexible extension to your current business and technology framework: we deliver the necessary software and connectivity via ASP managed services, while other brokers can provide execution, clearing and settlement services for those markets where you require them.

The Valdi suite centres around the provision of Smart Order Routing capability, hosted and managed as a service, with no restriction or price implications on the number of exchanges and/or MTFs you connect to. Market membership in each case can be yours or your partner broker's. You use or add



Valdi Liquidity Solutions: schematic view

your own market memberships wherever this makes business sense for you, and you leverage other firms' memberships where it doesn't.

Algorithmic trading capability is also provided via the ASP service, working closely in conjunction with the Smart Router and triggered by workstation users or via your own in-house trading tools.

HOW IT WORKS

The diagram shows how the Valdi Liquidity Solutions model works in practice.

Orders can arrive from clients, via FIX or SunGard trading workstations, or from in-house order management and trading systems. From this point onward in the order flow, the Valdi managed services

come into play, accessed from your systems and workstations via SunGard's global network.

At Valdi's entry point, trading strategies can be applied using the full range of capabilities of the Valdi Algo Trading and Algo Services trading suites.

All orders can then be sent either direct to markets or to the Valdi Smart Order Router for the decisions on routing of child orders. The SOR algorithms are continually optimized by SunGard's market specialists, and then set for all clients, meaning that full mutualization of infrastructure is possible and cost-effectiveness is maximized. The Smart Order Router and associated Market Data Aggregator (which delivers the consolidated view of market depth to your trading screens and applications) are core service elements.

Orders can then be passed either to SunGard's ASP trading servers for execution under your own name, with pre-trade risk management checks carried out by the high-performance Valdi Selector

module, or - and this is where the Valdi suite's unique flexibility lies - to your partner broker for the markets where you do not hold membership (or where a partner's higher aggregated volumes can achieve better transaction pricing). Order flow is routed to the partner with low latency via SunGard's global network: often linking via the same local Network Hub, of course, in particular to the cluster of exchange and MTF platforms located in London.

Symb	Last	Var	Time	TOY
HILO000387058.EUR	5.740	-0.725	11:52:49	911145
AMSTERDAM	5.740	-0.725	11:52:49	689K3
XETRA	8.000	-0.270	09:45:09	1100
TURQUOISE	5.965		09:41:03	45030
CHIX	5.735	-0.760	10:52:07	166K0

R	bik	vol	bid	ask	vol	bik
1	CHIXXAMS	500	5.740	5.742	970	CHIXXAMS
2	AEX	40	5.740	5.743	1250	CHIXXAMS
3	AEX	5970	5.730	5.745	1400	AEX
4	TURQUOISE	1537	5.725	5.750	6580	AEX
5	AEX	300	5.720	5.750	2749	TURQUOISE
6	TURQUOISE	9624	5.710	5.770	9853	TURQUOISE
7	AEX	525	5.710	5.775	800	CHIXXAMS
8	CHIXXAMS	800	5.701	5.785	1537	TURQUOISE
9	AEX	6500	5.700	5.800	570	AEX
10	TURQUOISE	1817	5.690	5.820	300	AEX
11	AEX	1000	5.690	5.830	1438	AEX
12	AEX	600	5.680	5.830	900	CHIXXAMS
13	CHIXXAMS	2500	5.670	5.840	3920	AEX
14	AEX	3000	5.660	5.845	1000	CHIXXAMS
15	XETRA	1091	5.660	5.855	3913	AEX
16	AEX	5400	5.650	5.860	3563	AEX
17	CHIXXAMS	900	5.650	5.890	1087	XETRA
18	AEX	900	5.640	7.980	270	XETRA
19	CHIXXAMS	1000	5.630	9.300	23	XETRA
20	XETRA	200	4.500	9.800	260	XETRA
21			13.000		350	XETRA

Example of pan-European order book: a consolidated view of market depth

Where you use your own memberships, we offer managed connectivity to all equities exchanges in Western Europe, all the significant pan-European MTFs and also several dark pools. The market gateways in all cases are fully secured, including dual telecommunications paths for the primary exchanges.

Valdi Trade Audit software is also hosted as an integral part of the service, providing the base for trade databasing obligations and a range of Transaction Cost Analysis capabilities, supporting demonstration of Best Execution.

Exec Reference	Event Type	Event	Exec Exchange	OrderRef	Rank	RefOrder	RefQty	RefPrice	RefTime	RefStatus	
06/05/2009 11:53:50	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	1	CHIX	113	49.96	49.91	200	Partial
06/05/2009 11:53:59	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	2	Paris	518	49.95	49.92	700	Partial
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	3	CHIX	763	49.95	49.93	1510	Partial
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	4	CHIX	962	49.96	49.93	775	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	5	CHIX	209	49.98	49.98	1524	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	6	CHIX	48	49.99	49.99	1124	Partial
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	7	Paris	1207	49.92	49.94	369	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	8	Paris	1027	49.97	49.96	184	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	9	Paris	745	49.93	49.96	1358	Partial
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	10	Paris	519	49.79	49.95	708	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	11	Bourse NTS	1362	49.92	49.96	1267	Bourse NTS
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	12	Frankfurt	1066	49.98	50.23	1066	Frankfurt
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	13	Bourse NTS	1300	49.92	50.09	1300	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	14	Paris	1300	49.95	50.24	1300	Bourse NTS
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	15	Frankfurt	680	49.72	51.17	680	Frankfurt
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	16	Paris	680	49	50.13	680	Bourse NTS
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	17	Bourse NTS	26	49	50	3000	Order
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	18	Bourse NTS	180	49	50	3000	Frankfurt
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	19		1515		300	Frankfurt	
06/05/2009 11:54:06	AC - Order acknowledgement		Paris	MTF12CHIXXAMS	20		1810		200	Frankfurt	

Benchmark of an order with the best limits available on the markets at the trading time and complete audit trail



The technology elements of the Valdi Liquidity Solutions offer, provided by SunGard Global Trading, are well proven across the financial market community. We benchmark the performance of our products and services regularly against industry standards: our market gateways and pre-trade risk management servers (which form part of the core Valdi offering) can each handle up to 4,000 orders per second with minimal latency. We provide ASP managed access to 100+ markets and our Smart Router, with latency measured in the sub-1 ms range, consistently produces first-class Best Execution results for clients.

CUSTOMIZE THE SERVICE

You can customize the level of the Valdi Liquidity Solutions offer around two core levels:

- Technology outsourcing, where SunGard hosts market gateways and algo/smart routing facilities, helping to contain the cost increments involved in addressing the fragmented liquidity landscape.

- Technology and partial execution outsourcing: in this case a partner firm provides brokerage services for the MTFs and you retain your current market memberships, using our managed connectivity services. This of course further reduces fixed costs.

You can also derive value from combining your use of the Valdi Liquidity Solutions with several directly complementary SunGard products & services:

- The FIX Network Service provides managed FIX connectivity to consolidate all your order flow. If you're outsourcing the technical complexity of market connectivity via managed services, then the FIX Network Service provides essentially the same service for client connectivity, at all-in per-connection prices.
- A full range of professional trading workstations is available to meet the requirements of your traders and also your clients.
- Valdi Algo Trading/Algo Studio/Algo Services provide algo trading capability as a core service element if you wish to design and build your own algos.
- The Valdi Order Management System delivers a modular capability set designed to meet a wide range of business requirements, including IOIs, Trade Adverts and consolidated risk management across core and DMA order flows.

Valdi Liquidity Solutions are designed to make the move to full participation in the fragmented liquidity landscape straightforward and cost-effective. You can improve client satisfaction, gain a new competitive edge and retain full flexibility to cope with further market evolution, while avoiding the large fixed investments that these normally require.

www.sungard.com/valdi

For more information about Valdi Liquidity Solutions or other SunGard services,
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