It was late 2005—the beginning of the Chilean summer—and the top executives of Santiago Stock Exchange had begun a comprehensive dialog about what the future held for their industry and, more specifically, what they as an organization needed to do to prepare for it. The scenario they presented was of an industry in the midst of rapid—and accelerating—transition, fueled in large part by the steadily growing volume of cross-border trading activity. Just a few years earlier, when it had last conducted such an assessment, Santiago Stock Exchange was a predominantly local operation, with smaller trading volumes and fewer competitors. But now the dynamics of the industry were in flux—and much more change was on the way.

Amid the team’s discussions, there was a palpable sense of opportunity, a collective awareness that the Exchange was on the cusp of a new phase in its growth. The key to growth was, as always, to attract liquidity into the Chilean market by opening the door to new groups of investors from around the world. With a burgeoning number of global investors, including large hedge funds seeking to capitalize on the region’s rapid economic growth, offshore opportunities beckoned. But for all their optimism, the Exchange’s leaders were also realistic about the challenges they faced in rising to meet the opportunity.

Leadership Spotlight

Santiago Stock Exchange wasn’t about to watch the industry evolve around it and simply react to change. It saw an opportunity to attract new liquidity to both Chile and the region as a whole. In the Exchange’s efforts to become a global player, CIO Andrés Araya Falcone wore the hats of visionary, messenger and salesman.

How Santiago Stock Exchange got smarter

To Araya and his colleagues, the rationale for action couldn’t have been clearer. For the Exchange, attracting more liquidity is the key to not only its own revenue growth, but also to Chilean companies looking for resources to expand. To successfully attract liquidity into the Chilean financial market from large investors in places like London and New York, the Santiago Stock Exchange needed to adopt the rigorous transaction processing capabilities needed to handle the growing volume of high-frequency and algorithmic trading activity—and do so from the ground up. So it built a trade processing solution that increased its capacity tenfold, cut latency to microseconds and enabled real-time fraud surveillance. The Exchange’s transaction volume is up 50 percent in the first year.
A new era brings new challenges

As Chief Information Officer of Santiago Stock Exchange—a tenure that extends back to the Exchange’s most formative years—Andrés Araya Falcone was singularly qualified to lay out these challenges, and what it would take to meet them. After rising through the ranks as a programmer, Araya had in fact designed and built the Exchange’s first trade matching engine, the core component that matches bids and offers to complete trades. It had performed admirably in an era when the local market order flow averaged 30 per second and most trades were handled manually.

That was then. Araya was now making a convincing case to prepare for a whole new set of business and processing challenges stemming from the anticipated influx of liquidity into the Chilean market. One basic premise was that large investors from the United States and Europe—accustomed to the high-volume, low-latency processing capabilities needed to process their high frequency and algorithmic trading activities—would demand those same capabilities of Santiago Stock Exchange. That meant a roughly tenfold increase in transaction throughput that would only grow with time.

The benefits of Santiago Stock Exchange’s high-frequency trading solution

- 100 percent increase in real-time securities fraud surveillance
- 9000 percent increase in transaction processing capacity
- Substantial reduction in settlement risk by virtue of near real-time intraday settlement capability
- 49 percent increase in trading volume experienced in first year of deployment
- Reduction in order execution latency, from 200 milliseconds to microseconds
- System reliability less than 99.999 percent

But the future wasn’t only about scale. It was also about fundamental changes in the industry’s structure and practices, exemplified most prominently by the wave of new business relationships with other exchanges across Latin America that were then taking shape. The Santiago Stock Exchange was convinced of the need to establish creative linkages with other important exchanges in the region—a move also designed to attract liquidity—and having an open, flexible platform was just as important as scalability. Most importantly, it had successfully forged a consensus within the team on the need to take action to safeguard emerging growth opportunities.

Leadership is... Building support layer by layer

The diversity of the Exchange’s stakeholder groups—and their respective concerns and issues—made gaining support for the next-generation exchange a gradual, cumulative process.

“We as an organization recognized the need to position the Exchange for the future, but we also knew we needed to have everyone on board to get there. What bound it together was a common vision of how the [Chilean] market was evolving, and of our place in it.”

– Andrés Araya Falcone, CIO, Santiago Stock Exchange
Embarking on change

What Araya had secured from these deliberations was a mandate to look for alternatives. It would be up to him and his inner circle of trusted associates to explore, identify and evaluate their options for building the next-generation exchange. Given the strategic stakes, the timing of the decision cycle was superseded in importance by the need for circumspection and due diligence. In short, “getting it right” meant everything.

One thing Araya and his team recognized from the outset was that in the end, they would need to advocate for either buying an existing high-throughput, low-latency system from another established exchange (the prevalent industry practice) or building their own from the ground up. Over the next two years—amidst a flurry of overseas site tours, pilot tests, demonstrations and industry conferences—the outlines of the team’s options began to gradually take shape, though their minds remained very much open.

Then in 2008, at an international industry conference, Araya heard IBM present about a new low-latency messaging product that got his attention. Introductions led to a series of discussions and workshops. Most importantly to Araya, IBM worked with his team over a matter of months to develop a tangible proof of concept that bridged an important gap for his team. “Getting a hands-on look at what we could build ourselves was a breakthrough moment,” Araya explains. “It gave us the comfort level we needed to get behind that kind of a solution.” That comfort would prove essential in making the case to the Exchange’s many stakeholders.

Sharing a vision, gaining consensus

Over the course of the evaluation period, Araya and his team had been meeting regularly with the Exchange’s key internal and external constituencies to educate, build support and lay the groundwork for a decision. Internally, Araya had deliberated with fellow members of the Business and Technological Committee, including the Exchange’s CEO José Antonio Martínez Zugarramurdi and Chief Research and Developer Officer Gonzalo Ugarte Encina, to make his case. In the final analysis, however, the future of the next-generation exchange strategy would hinge on Santiago Stock Exchange’s most influential constituency—its broker-dealer customers who would rely on the proposed solution.

Araya was advocating a major change to the Exchange’s customers and he knew that building support would take time. Every two months, the C-Level officers of Chile’s five largest brokerages met with the team at the Exchange’s Santiago headquarters. Though the discussions were dense and the questions many, a climate of trust and good rapport prevailed, due in no small part to the group’s history of close collaboration on strategic technology issues in the past. With customers onboard with the low-latency messaging plan, the decision ultimately came down to the Exchange’s board of directors, and Araya had the numbers to back it up. “Metrics like a tenfold increase in throughput—which laid the groundwork for rapid revenue growth—were a powerful part of the business case,” Araya explains. “But it was the promise of 99.999 percent system reliability that closed the deal.”

Santiago Stock Exchange:
The parameters of a smarter trade processing engine

Instrumented
The solution aggregates different sources of market data into a common format that can be easily consumed by Santiago Stock Exchange investors.

Interconnected
The solution distributes data to both co-located and remote access applications and users.

Intelligent
The solution creates patterns and correlations of events that represent fraud and suspicious events automatically, and “learns” and adapts from experience and new associations to detect new kinds of suspicious or fraudulent activities.
Delivering from the start

By June 2010, with months of rigorous testing behind it, Santiago Stock Exchange's high-frequency trading solution, known as Telepregón HT, went live. And it wasn’t long after that the future the Exchange had planned for – one of rapid growth and innovative alliances – had begun to unfold. With the Exchange now open to the American and European markets, trading volume increased by 49 percent in the first year, while trade messaging latency fell some 250 percent, from 200 milliseconds to microseconds. To high-frequency and algorithmic traders – for whom the expression “time is money” is more than a catchphrase – this faster processing can make the difference between profit and loss.

Araya is also quick to point out that beneath the solution's low latency execution capabilities, the need to optimally manage the trade processing flow is absolute. “With thousands of transactions per second coming in, gateways and matching systems need to be smart enough to pick up in a microsecond whose orders are coming in first, how efficiently they can match it, and then respond back to the clients.” The solution’s intelligence is also evident in its capacity to reduce liquidity risk by dynamically monitoring market liquidity levels and making automatic adjustments to ensure that each party’s margins are covered.

To compete for liquidity on the global financial stage, Santiago Stock Exchange also needed to ensure that its fraud detection capabilities could keep pace with the growing volume and complexity of its trading activities. To that end, Araya’s implementation team used IBM WebSphere® Business Events to create a smart surveillance system that monitors all transactions in real time in order to proactively detect and act on potentially fraudulent activities.
A global player emerges

One development that signaled the emergence of Santiago Stock Exchange as a global player was the successful formation of an integrated cross-border trading alliance with Peru and Colombia known as MILA (Integrated Latin America Market), making it the second largest exchange in South America in market capitalization. With the planned integration of Mexico exchange, MILA’s transaction volume is expected to as much as double by 2012—a growth rate that Araya says wouldn’t have been possible without the low-latency processing solution. “Our investment exemplifies how, in financial services, smart infrastructure is the foundation of transformation, both for our organization and for the region as a whole.”

Though Araya still considers himself a “hands-on IT guy” at heart, his focus had long been shifting toward the business side—even before the project. Since then, the trend has only accelerated, with more and more time spent addressing operational, regulatory and even customer-facing issues. These days, in fact, he spends more time than ever in overseas meetings with current and prospective customers in preparation for new trading relationships. “It’s an indication,” Araya explains, “that the global market is the key to our future growth—and that the future is now.”