

# The Future of Exchange Trading Technology

By **Ulf Carlsson**, General Manager North Asia & Japan, Market Technology, OMX



**Around the world, financial exchange Chief Technology Officers (CTOs) struggle to create smart IT strategies designed to increase competitiveness and deliver high ROI while, at the same time, ensure readiness for the future. But exactly what does the future hold? How will the exchange industry change in the years to come?**

To predict the future, we first need to look at the past. The development of electronic trading has progressed with the speed of light since the Toronto Stock Exchange (TSX) became the first to introduce electronic trading in 1977. During the 1990's almost all European and Asian exchanges went electronic, and globally exchanges have closed trading floors as electronic trading has become the norm.

Surprisingly, US exchanges were the last to give up their trading floors. Today, however, they are leading the electronic trading push, a development driven by fierce competition, both among market participants and the exchanges themselves.

In this very competitive market, technology has become the weapon of choice in an "arms race" to attract the most liquidity. Today, almost three decades after the birth of electronic trading, 25 percent of the trading volume at

**"... technology has become the weapon of choice in an "arms race" to attract the most liquidity."**

the four largest US exchanges is automatic. Exchanges are making necessary improvements in performance and capacity to meet competitive demands, and these two issues remain major factors affecting exchanges' IT strategies worldwide.

**- Other significant trends include demutualization and globalization.**

While globalization is certainly not a new thought, it has become more significant to the world's financial marketplaces during the last few years. As more trading boundaries are removed, we see more cross-border harmonization of trading rules and regulations. And, increasingly, market participants are becoming truly global and maintaining a worldwide presence.

Even so, demutualization is probably the strongest driver, forcing traditional marketplaces to rethink their roles and putting the burden on CTOs to reexamine their future IT strategies.

OMX pioneered demutualization in 1987 when it became the world's first privately owned exchange and became listed on the Nordic Exchange in Stockholm. Today, more than 20 exchanges have gone public, and many more are in the IPO

**"... more than 20 exchanges have gone public, and many more are in the IPO planning process."**

planning process. While today's public exchanges continue to face traditional demands from regulators, governments, issuers, and market participants, they also face mounting pressure from shareholders who want dividends, cost efficiency and profitable growth. Meeting these new demands often requires a new approach.

Exchanges must spend more time on business development and introducing new products and services. Time-to-market is crucial to competitiveness. This is already apparent in the US where marketplaces are constantly increasing capacity, or introducing new functionality at a rapid pace. In Europe competition between marketplaces is growing. But, with a few exceptions, like the German Bund futures contract move from LIFFE to Eurex, competition is still not that fierce. This will change with the introduction of the Markets in Financial Instruments Directive (MiFID) in 2007. MiFID is designed to create a single European market in financial services and is expected to further open Europe's marketplaces for new competition, such as alternative execution venues.

The Asia Pacific region was an early adopter of electronic trading and has also been active in the demutualization of its exchanges. For example Hong Kong Exchanges and

---

***“The Asia Pacific region was an early adopter of electronic trading and has also been active in the demutualization of its exchanges.”***

---

Clearing (HKEx), Singapore Exchange (SGX), Osaka Securities Exchange (OSE), Australian Stock Exchange (ASX) and Sydney Futures Exchange (SFE) are all demutualized today. Several other Asia Pacific exchanges are currently planning IPOs.

Competition among Asia Pacific exchanges is beginning to heat up as well, the most well-known example being OSE and SGX competing over the Nikkei225 contract. There is also growing competition among exchanges worldwide to attract Chinese listings. But still, competition in Asia Pacific has not reached the levels we see in the US and Europe. This is mainly due to regulation constraints and restrictions on foreign participation in many markets. However, it is likely just a matter of time until we see more attempts to “steal” trading volumes and create attractive and competitive financial hubs in Asia Pacific. As an example, the consolidation of ASX and SFE is a clear attempt to create a new financial hub in the region.

An interesting observation is that IT investments may not automatically generate ROI as in the past, i.e. faster technology results in increased trading which leads to higher revenue. As expected, the introduction of low latency, high capacity systems increases order traffic. But recent research sponsored by OMX<sup>(1)</sup>

---

***“... higher order rate, decreased order sizes, and eventually a lower number of trades, i.e. higher order to trade ratio.”***

---

shows some interesting side effects. The use of ATS, Direct Market Access (DMA) and algorithmic trading also increases the order to trade ratio (OTR) significantly. This can result in higher order rate, decreased order sizes, and eventually a lower number of trades, i.e. higher order to trade ratio. IT investment in extra capacity does not guarantee higher trading revenue for an exchange. Research shows large differences in OTR in the global financial markets today. We have studied equity derivative exchanges worldwide and found that, on average, the OTR in the US is 10 times that of Europe, which is 10 times that of Asia. (i.e. 1000 orders per trade

in the US, compared to 10 orders per trade in Asia.) There are many reasons for this, however, the key one is market maturity, i.e. regulations, market openness, competence level, IT infrastructure, etc., and the sophistication of the market participants in using ATS and algorithmic trading.

***- So what does this mean to exchange CTOs around the world?***

In the US, it means that IT investments are not guaranteed to help generate more revenue. However, investments are crucial to remain competitive. In Europe, the CTO might still be able to stall investments and use traffic restrictions and penalty fees to bring down OTR. However, with MiFID, competition will force exchanges in Europe to compete with other high-performance and low cost trading venues. Setting restrictions on order flow will be like closing a shop the week before Christmas. Buyers will just shop elsewhere.

In Asia Pacific, the importance of new and speedier technology as a competitive factor will differ depending on location and market maturity. There are a few countries where

---

***“ Given the study results, the exchange estimated peak performance value could perhaps soon increase 100-1000 times ! ”***

---

development may move faster based on competition and regulatory advances. Japan, for example, is currently experiencing growing volumes and new trading patterns in its stock market. The large difference in OTR between geographical markets, as shown in the OMX sponsored study, is an important finding and suggests that Japanese exchange CTOs reevaluate their peak capacity figures. Given the study results, the exchange estimated peak performance value could perhaps soon increase 100-1000 times !

***- But who will be the winners? Which IT strategy will prove to be the best way to grow market share, in a stable and controlled way?***

The first generation of exchange technology focused on building a reliable system to trade one product, primarily stocks, for a domestic market. These systems were often built in-house or by local consultancies, since local knowledge was important and there were not many global suppliers of exchange trading systems. Further, control of the system solution was seen as a crucial strategic asset, both by regulators and the exchanges as a way to ensure a high quality reliable market and to protect uniqueness. Commoditization started with second generation trading systems as more exchanges realized it didn't make sense to constantly reinvent the wheel. Today, there are several

examples of independent vendors supplying high performance, multi-asset trading systems to exchanges around the world. This is made possible by the increasing harmonization and standardization that has followed the exchange industry's globalization.

Going forward, continued commoditization is likely. There are two key contributing factors to this. First, the exchange industry will continue to play a vital role in a country and region's capital market to create growth and prosperity, which also means that the exchange industry will continue to be tightly controlled and regulated. Supervision and control will be ever more important to guarantee fairness and create a level playing field, and there will be increased

---

***“ The exchange industry will continue to play a vital role in a country and region's capital market ...”***

---

pressure to offer standardized solutions with high interoperability to a low cost of trading. Second, the high development costs and risks involved in running and launching large IT projects requires highly specialized expertise not easily available to all. The competence to develop robust high speed trading systems will cluster in a few highly sophisticated pockets.

IT will continue to be a key competitive factor for exchanges. However, shareholders demanding cost efficiency combined with the specialized competence necessary to develop and support 3rd generation trading systems, means that new types of IT solutions will evolve. The next generation trading systems will be a whole new breed with magnitude increases in performance and further standardized methods for trading and connectivity. The systems must run on industry standard hardware and software platforms while providing the flexibility to create unique features to improve competitiveness and attract order flow.

In the future, building an exchange trading system in-house will become as rare as building your own e-mail or operating system is today. The winners will be the exchanges that can combine the best technology with the most cost efficient operations, while offering the shortest time-to-market for

new products and services. Further outsourcing and use of standardized software is likely in order to free up resources and enable exchanges to focus on business development.

The bottom line is that the essential parts of trading system - hardware, connectivity and basic trading functionality - will converge into mainstream technology. Standardization and harmonization will lead to the electronic trading of common financial instruments in a similar way globally. At the same time, new demands on performance and capacity, coupled with the requirement for round the clock 24x7 trading and the need for niche functionality to attract liquidity, will require significant investment in the next generation trading technology.

I believe the exchange industry will follow a similar pattern to the airline industry, where only a few premium suppliers actually build the airplanes used by the airlines. In the future, exchange trading systems will be supplied by a few large vendors with the expertise to build reliable high speed trading systems and to fund R&D projects and support a global customer base. As with the airlines, exchanges can choose to serve their home market, or expand globally based on their individual business model.

<sup>1</sup>. Order to trade ratios at Asian derivatives exchanges, Masters thesis in Technology Management, Lund Institute of Technology, Martin Cramer, Magnus K. Olsson, Magnus L. Olsson, 2006. **FIX**

***Any thoughts on this or other articles?***  
*Please send any comments, referring to this article as Vol 1 Issue 12 GL1, direct to Edward at [edward@fixglobal.com](mailto:edward@fixglobal.com)*

