

# Smart or Out-Smarted?

By Michael O’Conor, Jordan & Jordan

The phrase **Smart Order Routing** (SOR) has become standard terminology only in the past few years with dramatic changes in equity trading caused by an influx of new competitive execution venues, regulations designed to protect the investor and, most obviously, enabling technology. In reality, *Smart Order Routing* has been around for a very long time both within and outside the financial community. Thinking of Smart Order Routing in general terms, the concept is quite simplistic. *Smart* refers to how effectively a person uses his or her brain to achieve an optimal result. An *Order* is some type of instruction given with the expectation that action will be taken. *Routing* refers to setting a course aimed at reaching a final destination.

The one variable that is not evident in the phrase Smart Order Routing, but is the real basis of the function particularly in the context of today’s markets, is *time*. Time became the driver of smart order routing when people willingly paid more to get information (or goods, or bodies) from one place to another faster than other available methods. Back in the early days of expansion into the American West, information (mail) moved via stagecoach or steamship. Time wasn’t a consideration because there were no alternatives. With a desire to make money and to reduce the time it took for mail to travel from coast to coast, the Pony Express was started in 1860. The Pony Express was well received despite the cost, as people found its speed preferable to slower methods. Within a short time however, the Pony Express fell victim to another smart idea; one that was faster - the railroad. The pattern continued as smart people came up with increasingly faster and more efficient ways to move information, goods and people from one place to another. The telegraph and then the telephone introduced new and innovative ways to transmit messages, followed by radio and television. The automobile and the airplane spurred national and international commerce and travel. The fax machine moved data and presented the first real threat to the Postal Service. Smart Order Routing was the motivation behind some of the greatest inventions in history.

## The Evolution of Smart Order Routing (SOR) in Equities

From a trading perspective, the early years were fairly simple. There were just a few players and they were all located in the same place - under the Buttonwood Tree. Smart order routing meant knowing who was willing to buy or sell a particular stock on a particular day at an amenable price.

Two hundred years later in the late 1980s, technology became more prevalent in order management. In an attempt to lock in client order flow and free traders up from smaller trades in order to handle the larger trades, many of the larger broker dealers began to offer a new service called *Direct Order Turnaround* or *DOT*. DOT boxes were the first electronic machines to provide the institutional buy side with what we now call “direct sponsored access”, and while not very smart (they could be directed to only one destination, the New York Stock Exchange) they were the forbearers of today’s Smart Order

Routers. As dealers rushed to offer DOT boxes to their trading partners, one can imagine the clutter of machines on institutional clients' desks.

In 1995, the Financial Information Exchange (FIX) protocol was introduced by Fidelity and Solomon Brothers as a way to bring consistency in connectivity to support growth in electronic trading. FIX was a "common" messaging standard that would allow all interested firms to use the same communications protocol when exchanging data electronically. Few knew it at the time, but FIX was the true enabler of the Smart Order Routing phenomenon that was soon to embrace Wall Street.

The late 1990s and early 2000s brought to the financial industry a potent mix of increased regulatory pressure, competitive juices and tremendous strides in technology, which led ultimately to unprecedented growth in off exchange execution venues and huge increases in trade volumes.

### **U.S. Regulators Take the Reins**

As early as 1978, the U.S. Securities and Exchange Commission (SEC, or the Commission) called for development of linkages among exchanges and over-the-counter trading venues, with order routing systems capable of transmitting orders among the various markets. The Intermarket Trading System (ITS) provided the foundation for the U.S. national market system although it was replaced in July 2006 when the Commission adopted Rule 610 (Access Rule). The Rule "requires non-discriminatory direct or indirect access and enables the use of private linkages offered by a variety of connectivity providers."<sup>1</sup> Generally, the FIX protocol facilitates execution centers' (exchanges) as well as brokers' ability to comply with the more recently crafted rules under Regulation NMS (Reg NMS). The Access Rule also enabled the proliferation of alternate trading venues in the U.S. while also supporting the brokers' obligation to achieve what has become known as "best execution."

The prescriptive, rules based, approach of the SEC in shaping the U.S. equities markets is in sharp contrast to the principles-based approach taken by Committee of European Securities Regulators (CESR) in instituting the Markets in Financial Instruments Directive (MiFID). For example, the detailed requirements of Reg NMS describe the level of automation required for quotes to be protected, define the national best bid and offer (NBBO) and aim to prevent trades from being executed at prices inferior to protected quotations. The rules also require trading centers to assure that their quotations are fully accessible by other trading centers and order routers.<sup>2</sup>

## **Best Execution in the Current Environment**

---

<sup>1</sup> SEC Order Approving NMS Linkage Plan: <http://www.sec.gov/rules/sro/nms/2006/34-54551.pdf>

<sup>2</sup> In the NMS Release, the Commission recognized the practical challenges of implementing intermarket price priority at the level of sub-second time increments. In the national market system, multiple trading centers across the U.S. simultaneously quote and trade in NMS-regulated stocks. Particularly for active stocks, many orders can seek execution against a single displayed quotation, many trades can be executed, and many quotations can be updated, all within a single second.

In deciding how to execute orders, a U.S. broker has a duty to seek the best execution that is reasonably available for its customers' orders. That requires the broker to evaluate the orders received from *all* customers in the aggregate and periodically assess which competing markets (e.g. exchanges, market makers or electronic communications networks (ECNs)) offer the most favorable terms of execution. Some of the factors a broker must consider when executing customer orders include: the opportunity to get a better price than what is currently quoted, the speed of execution, and the likelihood the trade will be executed.

Best execution under MiFID regulations can be defined in any way the broker sees fit, as long as appropriate policies and procedures are developed and applied to achieve best execution. MiFID's focus is not as price-centric as U.S. rules intend best execution to be. Certainly in the current environment, settlement certainty and counterparty risk are perhaps among the most relevant factors in providing best execution.

The intermarket linkages demanded by U.S. rule makers have provided the underlying infrastructure necessary for market participants to be *smart* about routing orders. In the US, there is one government backed regulatory body, one currency, readily available consolidated market data, and one clearing and settlement venue (at least for the moment). Many feel the lack of a cohesive infrastructure in the Euro markets that offer access to a consolidated, reliable source of market information has prevented MiFID from meeting expectations for its success. In Europe, one must also deal with multiple governments and regulatory bodies (although CESR attempts to provide a certain level of consistent securities regulation), as well as multiple currencies and no central clearing agency. Could any router be *smart* enough to deal with all those variables? Clearly, the European markets present a unique challenge for any SOR and a potentially huge cost for those getting into the game.

### **SOR in Europe**

While the creation of new market venues is a positive outcome of MiFID and recent innovation, the technology tools to access those venues smartly and efficiently cannot operate to their fullest potential without access to timely and accurate market data. Commercial products are now competing to fill the gap; however, thus far each has their deficiencies and none are yet viewed as a *de facto* standard. Many complaints about the market data stem from inconsistencies and replication in trade reporting and other issues that MiFID does not explicitly address.

While the need for smart order routing in Europe is merely in its infant stages, market fragmentation is a growing issue as new market centers emerge. Connectivity, data consolidation and smart order routing technology will become more developed as sophisticated traders seek to take advantage of the alternatives in execution venues including global exchanges, multi-lateral trading facilities and dark pools.

### **SOR in Asia**

In Asia, the demand for SOR has yet to materialize in any significant way. Dual listings of securities are only available in two markets: Japan, with dual listings on the Tokyo Stock Exchange (TSE) and the

Osaka Securities Exchange (OSE); and India, with securities listed on both the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE).

Additional challenges to supporting Smart Order Routing for the Asian markets are similar to the challenges one faces in Europe where there are many regulatory bodies, multiple currencies, no consolidated market data and no central clearing agency. Add to these challenges the fact that there are very few alternative trading venues and inconsistent technical capabilities within each country.<sup>3</sup>

Until there are clear business drivers in Asia, there is little reason to expect a sharp uptake in SOR. However, as competition for customer order flow increases, the region should see an increase in broker sponsored and commercially sponsored alternative trading venues. Combined with an increase in broker internalization programs, the day will come for Smart Order Routing in Asia.

### Smart Order Routing is NOT Algorithmic Trading

The phrases Smart Order Routing and Algorithmic Trading are often used interchangeably, when in fact they are quite different, although complementary, functions. Smart Order Routing considers only **Where** the order is being directed and at **What** price. Algorithms may have determined **What**, **How**, and **When** the order will be placed. Algorithmic trading manages the “parent” order while a smart order router directs the “child” orders to the desired destinations.

#### **What Does *Algorithmic Trading* Mean?**

A trading system that utilizes very advanced mathematical models for making transaction decisions in the financial markets. The strict rules built into the model attempt to determine the optimal time for an order to be placed that will cause the least amount of impact on a stock's price. Large blocks of shares are usually purchased by dividing the large share block into smaller lots and allowing the complex algorithms to decide when the smaller blocks are to be purchased. Algorithmic trading models are most commonly used by large institutional investors due to the large amount of shares they purchase on a daily basis. Complex algorithms allow these investors to obtain the best possible price without significantly affecting the stock's price or increasing purchasing costs.

Source: <http://investopedia.com> Investopedia is a Forbes digital company.

### How Does One Become a *Smart Order Router*?

---

<sup>3</sup> One of the big challenges with Smart Order Routing, whether in Europe or Asia, will be normalizing the basic data from each execution venue (symbology, currencies, tick sizes, order types, etc) in order to make *smart* decisions.

*Smart* starts with a clear investment and execution policy. Consider first what you are you trying to accomplish. What have you promised your clients or investors?

### Learn the ABC's of Order Routing:

**A**ccess to real time market data from each venue or a consolidated stream from a commercial provider.

**B**asic software to identify and direct messages to appropriate destinations.

**C**onnectivity to the selected execution venues. This process can be as simple as linking to one of the many Virtual Private Networks available within the financial services space or as challenging as maintaining dedicated lines to each of the desired venues.

### Raise your Order Routing IQ with:

- ✓ Low latency market data
- ✓ Access to trading venues either through direct membership or sponsored access (Connectivity providers can serve as a sponsoring broker dealer. They can do this as they are non-executing (non-competing) brokers.)
- ✓ Clearing and settlement arrangements with all venues
- ✓ Some form of algorithmic trading capability
- ✓ Access to historical trading details combined with current market data

Once the curriculum for Smart Order Routing is completed, two additional elements are essential to compete at the highest levels.

- ✓ Power
- ✓ Speed

A powerful server network and SOR technology is needed to analyze the huge volumes of historical and current data utilized in making *smart* routing decisions.

With the power in place, speed is achievable in the form of low latency data providers and co-location strategies. The drivers behind low latency and co-location are burgeoning market data and trade message volumes.

Growth in market data traffic and trade volumes in recent years has been staggering. The Financial Information Forum (FIF) provides monthly statistics to its members to assist in capacity

planning.<sup>4</sup> Analysis of market data trends tracked by FIF shows that One Second Peak volume on the Consolidated Quote System<sup>5</sup> (CQS) has grown 918% since 2006, with a Compound Annual Growth Rate (CAGR) of 117%. The Unlisted Trading Privileges (UTP)<sup>6</sup> Quotation Data Feeds (UQDF)<sup>7</sup> claims its Five Second Peak volume has grown 465% since 2005 which represents a 54% CAGR. FIF reports similar trends in trade volumes. The Consolidated Trade System (CTS)<sup>8</sup> One Second Peak volume has grown 572% since 2006, with an 88% CAGR. The UTP Trade Data Feed's (UTDF)<sup>9</sup> Five Second Peak volumes have grown 175% since 2005, representing a 29% CAGR.

To understand co-location one must look no further than to the significant competitive pressures that scream for “faster-therefore-better-execution”. What started out as a desire to be in closer proximity to an execution venue has grown to demand placement of servers within a venue’s existing firewalls. “... the increasing pressure that they (exchanges) face from regulations such as MiFID and Reg NMS in the US, plus a demand from the market for lower transaction fees has forced them to compete on price and product. Many have targeted the low latency market as a possible source of new revenue streams.”<sup>10</sup>

## Power – Speed – Capacity – Location

### What more will the Future require of Smart Order Routers and their users?

---

<sup>4</sup> See [http://www.fif.com/md\\_capacity/](http://www.fif.com/md_capacity/)

<sup>5</sup> **CQS**: “The Consolidated Quote System collects and disseminates, electronically, current bid and asked quotations along with volume, from all and to all market centers trading listed stocks.” Source: [www.nyse.com](http://www.nyse.com)

<sup>6</sup> **UTP**: “An Unlisted Trading Privilege is a right provided by the Securities Exchange Act of 1934 that permits securities traded on any national securities exchange to be traded by other such exchanges.” Source: [www.nyse.com](http://www.nyse.com)

<sup>7</sup> **UQDF**: “The UQDF provides best bid and offer (BBO) quotes from the UTP participants as well as the consolidated national best bid and offer (NBBO) quotes for securities listed on the NASDAQ Stock Markets.” Source: [www.nasdaqtrader.com](http://www.nasdaqtrader.com)

<sup>8</sup> **CTS**: “The Consolidated Trade System receives and disseminates, electronically, listed stock last-sale prices in all markets in which they trade.” Source: [www.nyse.com](http://www.nyse.com)

<sup>9</sup> **UTDF**: “The UTDF provides trade data from the UTP participants for securities listed on the NASDAQ Stock Markets.” Source: [www.nasdaqtrader.com](http://www.nasdaqtrader.com)

<sup>10</sup> *Automated Trader Magazine*; <http://www.automatedtrader.net/automated-trader-feature-36.xhtml>

Some of the newer approaches have emerged as hybrid solutions that combine an Algorithmic Trading Engine with a Smart Order Router. These flexible and multi-functional tools are now managing real time execution data as well as information derived from pinging dark pools, and utilize streaming market data to re-evaluate existing orders for re-routing and/or re-balancing.

As Smart Order Routing programs continue to expand globally and functionally, significant questions remain as to their effectiveness:

- Does your SOR comply with the regulatory requirements of MiFID and Reg NMS?
- What is your execution success rate with each of the destinations you route to?
- Are you achieving “best execution” at each of the venues you route to?
- How does each of these venues compare to the others?

The answers to these and similar questions can be uncovered with a deep dive analysis of the routing messages and execution reports a broker receives and stores every day. *Smart* providers or users of SOR capabilities are finding ways to leverage the data they have on hand to be proactive in making business decisions, meeting compliance obligations and mitigating risk.<sup>11</sup>

## Smart or Out-Smarted?

The challenge for all participants in this space, not only the brokers but also the investment managers who are dipping in their buy-side toes, is: Is it all worth it?

Consider the impact of SOR and algorithmic trading on the equities market: Dramatic reductions in average trade size, a huge increase in market data volumes, and the corresponding costs to process it. Is it all worth it?

Before answering, it is important to understand what your firm is trying to accomplish from a trading perspective and do you have the economic and human resources to use a variety of methods to achieve your goals?

Will Smart Order Routing be around in five years? Enabled by technology and shaped by regulation, how will the market structure continue to evolve? One may speculate that there will be considerable consolidation over the next few years as only those with sharp and smart technology teams and very deep pockets will be able to keep up with the consistent and sometimes staggering growth in market volumes as well as the cost to support these global and very complex trading environments.

In these hugely competitive financial markets, what will be the next “best thing” that brokers will scramble to spend millions on to convince counterparties to trade with them?

---

<sup>11</sup> Jordan & Jordan’s Enterprise Compliance Solutions (ECS) assist broker dealers in meeting the challenges associated with Reg NMS, Best Execution, regulatory compliance and trade reporting activities.

Could it be... Talking to a trader?

**Jordan & Jordan** is a professional services firm focused specifically on the financial services industry, and the processes and technologies applied to this marketplace. Consultants with practical, hands-on experience assist industry executives in evaluating business alternatives, developing practical strategies, selecting suitable technology solutions, creating action plans and managing project implementation. Jordan & Jordan's familiarity with the securities trading process extends from decision support and order routing to back office processing and compliance reporting, providing a solid foundation for process review and problem identification/resolution.

**Michael O'Connor**, Senior Consultant and Director of Jordan & Jordan's Enterprise Compliance Solutions (ECS), has worked with numerous clients to improve their order management and order routing processes, and increase the cost effectiveness of their equity trading operations. Michael is recognized as an industry leader in promoting electronic trading, buy-to-sell-side connectivity and the use of standardized messaging. Michael's expertise in electronic trading platforms for Cash Trading, Program Trading, IOIs, Allocations, Fixed Income, Financial Futures & Options, Algorithmic Trading and Direct Market Access provides deep insight into trading platforms and market practices for many types of instruments.

Michael was elected to the Board of Directors of the NASDAQ Exchange in 2008. Michael was the Inaugural Chair of the Global Steering Committee of FIX Protocol Ltd. He also served as the Sell-Side chair of the Americas FIX Committee and was the inaugural chair of the FIX for Fixed Income Committee.