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Like many leading brokers, JP Morgan is wrestling with the challenges of adapting to the rapid increase in the use of automated trading tools. These tools give traders the ability to set up programs that will respond automatically to patterns in market activity and automatically submit orders directly to exchanges. In JP Morgan's case, the firm decided to anticipate the continuing evolution of these tools by borrowing advanced "sense and respond" technology from the defense sector and adapting it to the financial markets. In the following article, the firm's global head of electronic trading for futures and options explains why JP Morgan decided to take this approach and how this will change the role of the broker.

Consider the evolution of electronic trading. Banks, brokerage firms and asset managers around the world have used electronic systems for many years to help them execute and manage orders, especially in the equities world. Indeed, the hedge fund and program trading arena depends in a large part on the tools built to automatically analyze trends and implement models to capitalize on market opportunities.

Comparatively, electronic trading in the global futures markets is immature having experienced its greatest growth during the last seven years. Over this period, the futures markets have witnessed a consolidation of exchanges and platforms, as well as a shift of liquidity off the floors and onto screens. The key distinction here is that in the futures world, the defining force behind this movement was the client, not the broker.

The rise of automated trading in futures stemmed from a demand by clients that were not exchange members to "touch the market." They demanded direct access to market prices and the ability to send an order straight to the exchange without intervention by the broker.

Brokers evolved to become technology service providers, competing on execution functionality, technical support, straight-through processing and market reach in addition to core clearing services. Execution was awarded based on the

quality and breadth of a firm's technology offering, and not solely on the basis of a fantastic trade idea, cutting edge research, or sales coverage and flow. This launched the industry into a period of an "identity crisis" as brokers wrestled with questions about their role in a purely electronic world.

The Evolving Role of the Broker

Today, the demand for greater automation in trading is spreading like wildfire throughout the non-member client community. Sophisticated tools and algorithms that previously were available only to a small number of brokers, market makers, program traders and hedge funds are now available to a wider range of traders, changing the nature of the marketplace and the role of the broker once again. In order to compete in this new world, brokers will have to again capitalize on their core services of sales, trading and research to help clients define and build tools that help them trade more intelligently across markets and asset classes.

In a marketplace where programs trade against programs, the "basic" trader will no longer be able to make money without smarter tools and more creative ideas, and the "sophisticated trader" of today will be the "average trader" of tomorrow as each generation of automated trading tools is more broadly distributed and leveraged. The focus therefore will shift from automating a trading strategy to automating the idea behind the trading strategy. Speed and market reach are still core requirements for brokers, but the real differentiator will be building "intelligence" into automated trading systems, delivering it out to a much broader audience than ever before, and making it operate across market, product and asset class. Clients will look to their brokers for the information, technology, market experience and expertise to be able to help them compete.

This acts as a catalyst for the return of a day when brokers will need to marry investments made in technology with the quality of their people, ideas, analytics, research and cross market experience. Success will be defined by the means by which one is able to model and execute on that experience.

The New Generation of Trading Tools

While the last several years have been marked by the growth and impact of the trading software vendor, a new generation of trading tools is arising in this space. Today's platforms effectively define the core components of the "trading dashboard" for clients. Standards have been established to provide prices, order management, audit trails, feeds, and generic trading functions. These form a framework for what is to come, but it is evident that a pure extension of the existing platforms is unlikely to meet the new demands for more sophisticated and flexible automated trading systems. A whole new approach is required.

As traders have grown more familiar and comfortable with basic trading functionality, it has sparked demand for the

development of tools to model those trades that still require broker involvement despite the rise in electronic execution. For example, it is still common practice for brokers to manage VWAP (volume-weighted average pricing), icebergs or other such timed or sliced orders, inter-market spreads, baskets, and the like. As automated trading continues to evolve toward these more complex strategies, the solutions are challenging the boundaries of the role of the vendor, the broker, the client, and the systems.

Take the vendor. Though many of these tools are available in some form today, there has been a growing gap between what one tool can do generically and what a trader truly needs in order to achieve a competitive advantage once the model is automated. Leveraging a vendor system to release these models generically, has, in many instances, immediately negated the value of the tool. Effectively, the same model applied against itself will inevitably take away any competitive advantage gained from automation in the first place.

In an effort to address this conundrum, brokers at first scrambled to release simple Excel or API-driven tools to address each individual client's trading ideas. However, as the brokers began to head down this path, they experienced a further increase in the complexity of the ideas clients were hoping to model. They saw that the need for speed and performance was now exacerbated by the growth in programs trading against programs. They saw that the resources required to build, deploy and maintain these tools would continue to grow due to an increased need for flexibility, resiliency and responsiveness when trading against other programs. And they saw this quickly becoming expensive and unsustainable.

The client role in trading shifted as well. The clients who were most comfortable with automated trading soon realized that the key to their own success would come from the ability to define and develop trade ideas of their own. These clients often are reluctant to share their trade ideas with brokers or vendors for fear that their best ideas might be disseminated to the larger trading community. On the other hand, these clients do still look to the brokers to provide them with cutting edge technologies to layer onto their information, connectivity, and architecture. They also may look to the brokers for advice on trade ideas and concepts, possibly even on the building of automated trading tools, so long as this does not compromise their own intellectual capital.

In this new world of automated trading, brokers therefore need a technology solution flexible enough to suit both the clients who want to build their own trading tools and the clients with more generic needs. At the same time this solution needs to include a channel for distributing research to both groups of customers, with the functionality to execute those research ideas built into the automated trading system.

All of these developments highlighted weaknesses in the available automated trading technologies. First, the tools available in core vendor buy/sell technologies and the existing

technologies suited to the program trading community had become too generic and inflexible to provide any competitive advantage. Second, these tools were targeted to an audience that was often too narrowly defined, making them insufficient for the varied needs and profiles of the client community as a whole. Third, they required a high degree of programming knowledge, and therefore required significant amounts of consultation for basic traders. And finally, they were generally built on older technologies in a manner that was too inflexible to meet the nature and composition of the trading activity that clients intended to do in the future.

So Where Does JP Morgan Go from Here?

At JP Morgan, we decided that for all of the reasons described above, the evolution of automated trading had reached a crossroads. Based on our experience of delivering client-facing electronic trading in the futures world, we decided to make a strategic investment to architect a framework built to address what we believed to be the future state of e-trading within and across product offerings.

Though we were well aware of the systems already in place in the financial industry that were typically used to define algorithmic trading tools and models, very few could satisfy all of our requirements. The new generation of trading system needed to integrate easily within our client-facing framework, provide the speed and resiliency traditionally required by the hedge fund and program trading community, deliver complete flexibility, scale, and monitoring capabilities, and meet the programming requirements of both the basic and the sophisticated trader.

In setting out on this project, we decided that it had to be built on standardized technology used to service any type of information input or reaction that one could define, as well as outputs that could range from the generation of a trade, another rule, a notice, a control or any response that could be defined. We were looking for a tool that would become the "blank canvas" for the design and automation of any trade idea coming from any audience we service within and across product lines.

Some components were already in place. Our electronic trading platform, MORCOM eXtraTrade, could provide the basic "trader's dashboard" composed of order books, audit trails, tickets, basic trading tools and graphic displays, and our information and technical architectures could deliver the necessary prices, markets, data sources and interfaces. Our focus therefore was solely on the tool and the engine to be used to model trade ideas and deliver performance.

Execution needed to be instantaneous so the solution had to be performance intensive. The engine also needed to be so intelligent that it could sense, respond to, and track real-time changes in information and position. Therefore, the application layer needed to be both simple and flexible. Finally, the cost structure had to make sense so that the solution could be

distributed on a large scale. In other words, we were looking for a means to build, administer and maintain these tools from within a common architecture that could be leveraged in a cost efficient manner.

Having explored the platforms readily available to us, we decided to look beyond the financial industry to other industries with similar needs and problems. We found our best examples in the defense industry. Putting aside the moral debate, we thought, who more than the military would have an urgent need to develop weapons systems with the ability to sense and react to changes in information? Consider the sophisticated missiles developed by the defense industry. Their guidance systems have the ability to instantaneously and continuously sense and react to changes in weather conditions, altitude, position and a range of other variables in order to accurately track a pre-programmed course and hit their targets. We decided that whatever engine was intelligent enough to manage this response might be the right fit for our needs.

During the course of our search, we met with a variety of software houses with experience in providing sense and respond tools to the defense industry, and we chose several to work with as we developed prototypes to have a closer look at how well their systems would apply to our needs. We ultimately selected a U.K. company called Apama to provide the engine for this project, but we continue to watch this space for further advances in sense and respond technologies.

A Greater Role for Intelligence

Imagine what applying this technology does for the futures industry. Initially, the industry may use the tools developed with this technology to collect, analyze, and react to a specific set of conditions. At first, this may simply translate into straight-forward improvements in spread trading, basis trading, VWAP, or other existing models of execution. However, as traders get used to these new tools and the technology behind them, analytical minds will test the boundaries of the technology. They will build more interesting correlations and reactions, more valuable risk and control models, and more powerful and clever trading scenarios.

Smarter trading tools mean that the basic trader is unlikely to survive without being able to have access to equal amounts of automation. The manual order played out against the program places one on unequal footing to the other. This will give rise to more extended use of programs across a broader audience than that initially served by these tools today.

As more and more programs trade against programs, and as criteria such as performance, functionality and market reach normalize, the industry will set a higher and higher premium on originality. The industry will return to an environment where the quality of the minds analyzing the market and translating ideas into a better and more flexible models will play a greater role in the value proposition.

These tools will not begin and end with a trade. They may incorporate the ability to analyze information trends, flow, and positions, and they may be used to help regulators, risk managers or funds to manage exposure, understand trends, or simply hedge exposure.

These tools will also drive brokers to consider how to manage across product boundaries. It means changes in skills for technologists, traders and market analysts—all of whom will need to better understand what the other does.

Over these past several years, brokers have seen the value of market experience and expertise falling second to the ability to deliver a cutting edge technical solution to enable electronic execution. This next evolution will bring a time when the leading brokers will be better able to marry the investments made in execution technology with the value and quality of their research, their market expertise and experience, and their global presence.

Alison Pothier is global head of electronic trading for futures and options at JP Morgan Chase. She is based in London.

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