ARQA TECHNOLOGIES

HFT as Formula 1 of trading

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High-frequency traders and race cars. Aren't they similar? The "piranhas" of trading venues and racing machines of F1 are the fastest creatures in their respective worlds. Both challenge technology providers and stimulate progress. They shape technology standards of respective industries.

What teams compete in HFT? Can only large and rich companies afford to participate? Winning demands large upfront investments into technologies and people. Cars and pilots are only the tip of the iceberg. There are a lot of support personnel. Race cars do not look like normal cars. They are very specialized and expensive. They also require special driving skills.

The observations are generally true for HFT. But Russia seems an exception at least for now. There are local participants of Russian exchanges who take part in the races with their garage-developed cars. One individual investor managed to soup up a mass-produced car. Using a QUIK system he normally makes 12 million transactions a day or 300 transactions per second on average.

Technological approaches and know-how are intellectual property and they are carefully guarded. It is believed that they are the keys to success. Makers of winning cars are as a rule successful in mass production. Racing serves to promote brand names and test technologies soon to become widely adopted.

Cars have safety systems like ABS, VSA, ESP, etc. They serve to prevent crashes but slow down speed. Super-cars do not use such safety systems as they rely on the skill of an outstanding pilot.

We see the same in trading. For a retail client of a broker a strict system of restrictions is in place. For HFT it is yet to be fully applied. But at ever higher speeds safety requirements are becoming more critical.

In the world of racing safety is ensured by other means. Races are held outside of public roads (should HFT run separately?). There is no specific speed limit but speed is restricted through technical constraints. E.g. Drag Reduction System can only be used in certain zones and specified situations.

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ARQA Technologies welcomed the challenge of complexity and speed of pre-trade. It had been developing a versatile system of risk checks as a universal application for all types of trading within its front-office platform QUIK. Risk management was in high demand and had been successfully applied by Russian broker-dealers for years. Pre-trade risk checks for margin trading rely on models with dynamic evaluation of collateral parameters. A modified SPAN-approach for dynamic mark-to-market portfolio evaluation and other serious risk evaluation approaches are widely used.

So the challenge was to adapt developed risk control potential to HFT in terms of speed requirements. In order to achieve low latency we employ a separate module that makes a fairly straightforward order check. The decision to let through or block an order is taken on the basis of previously processed data automatically fed to the module by the QUIK server. The module thus makes sure that the account has enough resources before any order is validated. This is done instantly because by this moment all necessary parameters of the client's position (including pending orders) have already been computed by the separate server. All previously executed trades have been accounted and relevant market parameters have been adjusted by QUIK. This approach suits low-latency requirements of HFT clients. It may also be used to manage risks in external systems where direct integration with a principal risk server is not possible.

HFT challenges led us to come up with a fast pre-trade idea and then we applied it to the slow OMS field. And now our clients who use other front-office platforms are also able to apply risk control functions developed in QUIK to all of their order flow. We optimized data-centre infrastructure to suit HFT and this paved the way for higher throughput and overall improvement of the system's efficiency for the benefit of all clients.

In the same way in the world of cars we see mutual penetration of technologies. As a rule mass-produced cars acquire technologies from racing cars but with safety restrictions it is the opposite. Pre-trade risk checks become obligatory for HFT after they were initially developed for the safety of regular traders.

HFT machines compete with each other for profit and win consistently at the expense of lower frequency participants. But the landscape is changing. Liquidity is escaping to dark pools where HFT is restricted. The global trading infrastructure has been evolving towards lower latency and accommodation of high frequency trading there are now more safety mechanisms at broker level and at the level of trading venues. Regulators are also keen to ensure more safety in the system even at the expense of making some of HFT business redundant. Overall, the long-term future of HFT is far from certain. Those who can should enjoy it before they find themselves in a separate track like in the world of motorsport.