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Cloud-Based High Frequency Trading

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ABSTRACT

The technology that service providers and market participants have embraced over the past 20 years has greatly influenced the structure and trading practices of capital markets. High-frequency trading systems require speed and processing power since they are designed to analyse trends in tick-by-tick financial data and inform buying and selling choices. They also need back-end systems to be highly available and scalable, which comes with a hefty price tag. This paper explores the question of whether cloud computing can give trading companies the flexibility they need to thrive in the long run.

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Introduction

The nature of trading in financial markets has altered because of technological advancements and improvements in computers [1,2]. These advancements have shortened the holding times needed for investments and made order transmission and execution speedier than before. High-frequency trading emerged as a new investment discipline as a result [2]. High-frequency trading, to put it broadly, is the process of examining trends in tick-by-tick data and using that information to inform buying and selling decisions. The rise of high-frequency trading in the markets has been assisted by exchanges that offer high-speed, low-latency information flow [2].

Since high frequency trades are completed in milliseconds, high frequency trading systems necessitate speed as well as high availability and readiness to trade at any moment. Robust hardware safeguards the speed of execution, and systems are collocated with electronic execution platforms to reduce network latency. Increasing system capacity and grouping datacentres together will result in high availability. These all require expensive investments [2].

Using cloud computing architecture, the financial business cloud model for high-frequency trading builds an effective trading platform and IT infrastructure for financial organisations. This model deploys runtime risk management, analytics, trading, and data collecting modules to the cloud. These modules are integrated by an Enterprise Service Bus, a standard-based integration platform that manages messages, routing, data transformations, and mediations amongst them. Essential activities such authorization and access, security, application management, policy management, account management, scheduling, routing, monitoring, auditing, invoicing, and metering are under the purview of Cloud Manager [2].

Financial organisations may now focus on business rather than IT by outsourcing their IT operations and infrastructure thanks to cloud computing.

Due to cloud providers' Service Level Agreements that guarantee availability and service delivery, it also helps to lower their operational risk and risk management expenses [1].

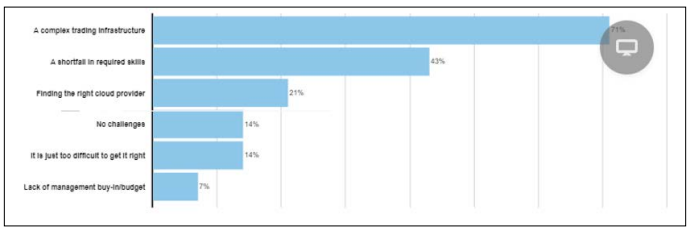
Benefits

- **Content Sharing and Collaboration:** When using a trading system housed in the cloud, users can collaborate virtually on the same document and transfer files with ease. Users who are geographically separated can convene digitally and in real time. This facilitates quick trading and idea exchange amongst traders. In this sense, customer service and product enhancement are replaced by travel time [3].
- **Industry Customization:** It is relatively easy to customise and adapt a cloud-based trading system to meet the unique needs of a firm. It can be set up to capture an organization's policies, roles, and business strategy. In turn, this makes it easier and possible in the event of a company merger [3].
- **Business Intelligence Advantage:** Compared to on-premises trading systems, cloud-hosted trading solutions offer numerous intelligence advantages. Large data sets may be stored in greater capacity because to the cloud's scalability, which also improves the trading system's connection with IoT data collection devices [3].
- **Data Security:** Cloud storage, on the other hand, safeguards data against such accidents with the highest security measures, guaranteeing an uninterrupted flow of commerce. For backed-up data, a guaranteed speedy data restoration method is also included [3].

Challenges

- **Regulatory Compliance:** HFT systems must abide by a few legal criteria, such as those pertaining to cybersecurity, data privacy, and market manipulation. For the system to continue to comply with all applicable requirements, close attention to detail and continuous compliance monitoring are necessary [4].
- **Managing Risks:** HFT systems can result in significant losses quickly, and they operate in a high-risk environment. To lower the risk of financial losses and minimise the impact of unforeseen market events, developers must plan and execute risk management measures [4].
- **High Costs and Resource Requirements**: High-performance computing infrastructure, sophisticated software development tools, and access to real-time market data feeds are just a few of the many resources needed for HFT software development. Smaller businesses may find it challenging to compete in the market with bigger, more established organisations as a result [4].
- **Competition and Market Volatility**: HFT systems compete fiercely amongst multiple organisations for the same trading opportunities in a highly competitive environment. Furthermore, because of the potential for significant losses from abrupt market swings, HFT systems may find it challenging to function well in volatile markets [4].

The following audience poll's participants also mentioned difficulties they had integrating cloud computing into their companies' high-performance trading infrastructure. One of these was that adding cloud would be difficult due to the intricacy of their trading infrastructure, and another was that they had trouble finding the necessary personnel [5].



Solutions

Businesses can use hybrid cloud solutions, which combine on-premises and cloud infrastructure to balance performance and cost, to overcome the difficulties in integrating cloud computing into high-frequency trading (HFT) systems. Risk management and regulatory compliance can be made easier by using managed services. To combat complexity and manpower shortages, engage in staff training and form partnerships with specialised cloud providers. This will ensure a seamless transition and optimised trading operations.

Conclusion

High-frequency trading (HFT) systems can benefit greatly from cloud computing's scalability, cooperation, and improved business intelligence. Leveraging managed services and hybrid cloud solutions can help with problems like integration complexity, risk management, and regulatory compliance. Financial organisations may ensure long-term flexibility and competitiveness in the fast-paced trading environment by optimising their trading infrastructure, reducing operating expenses, and investing in staff training and working with specialised cloud providers.

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