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QUANTUM COMPUTING FOR FINANCE

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GENERAL OVERVIEW

In the current unstable geopolitical and social landscape, financial institutions are actively exploring new ways to better address key business challenges. Many major industry players are prioritizing investment in the development of transformative technologies, which could help them withstand turbulence, grow revenue, and ensure future profitability.

Quantum computing could soon become such a game changer for the financial sector, despite previously being held back by hardware limitations. But banks, hedge funds, asset managers, and other institutions can potentially benefit from the ability of quantum computers to solve complex optimization and decision-making problems through greater access to the power of highly parallelized computations.

This paper discusses how your business can leverage this fascinating technology to deliver better services, gain a competitive advantage, and stay at the forefront of innovation.

KEY CHALLENGES

RESILIENCE TO EXTERNAL TURMOIL

Despite the challenges of rising inflation and recession, escalating geopolitical tension, and the lingering effects of the pandemic, financial institutions must still strive for robustness and growth. These uncertainties call for the development of accurate forecasting models and the implementation of more comprehensive decision-making and risk-management strategies. These will ensure smoother and more adaptable operational processes that make an institution less susceptible to external shocks.

SECURITY THREATS RISE

Cyberattacks targeted at financial institutions are skyrocketing. Fraud incidents and data breaches are now responsible for significant financial losses and potential reputational damage across the banking sector. But despite strict compliance with the latest security standards, financial institutions often remain vulnerable to elaborate attacks as malicious strategies evolve to counteract new preventive measures. This is why the demand for new reliable security protocols and tools as well as fraud detection methods continues to rise. To stay ahead of cybercriminals, financial institutions are therefore now looking to invest in technologies capable of identifying and eliminating both current and future threats.

AUTOMATING AND OPTIMIZING OPERATIONAL PROCESSES

As the flow of financial operations increases, due to the enormous amounts of data now being processed, there becomes a clear misalignment between the demand for highly skilled professionals and the available talent. The focus has therefore switched to greater automation and optimizing internal operational processes. This not only eases the workload on employees but also maintains efficient fast-paced workflows that yield more reliable outcomes.

SKILLED WORKFORCE SHORTAGE

One of the toughest challenges the financial sector faces is the depletion of the workforce as businesses strive to improve productivity. But, while many routine tasks in finance are decreasing due to automation and optimization strategies, new roles are emerging directed at research, systems deployment, control, and security. As transformative technologies emerge, the demand for high-impact professionals, who can learn, adapt, and thrive in unstable and stressful environments, will rise. Financial institutions are therefore trying to attract and retain fresh talent, while also reskilling valuable employees to help them reach their full potential in this new environment.

BUSINESS BENEFITS

Deploying quantum computing can:



Raise security standards to new levels.



Forecast stock market behavior with increased accuracy.



Reduce computational resources and speed up operational processes.



Enhance decision-making and risk assessment strategies.



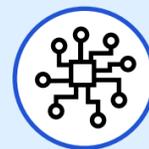
Manage heavy streams of financial data more efficiently in a dynamic mode.



Automate and optimize many internal processes.



Deliver a competitive advantage.



Enable the exploration of classically intractable complex modeling.

USE CASES



PORTFOLIO MANAGEMENT

Balancing risk and return to build an optimal portfolio of assets from a pool of investment options, and effectively modifying it in response to market behavior is the essence of portfolio management. This is arguably the most critical task for investment institutions. Quantum computing has long promised a considerable advantage in improving this activity through the application of Quantum Monte Carlo and hybrid optimization algorithms such as QAOA. Learn how our latest technique that combines factorization machine and quantum annealing can generate near optimal portfolio candidates in optimum timeframes.

ASSET PRICING PREDICTION

Forecasting the behavior of stock markets based on historical data is an extremely challenging task due to the high volatility and susceptibility to external shocks. To accurately predict which future asset prices can yield significant profit and reduce associated risks, financial institutions are striving to develop more reliable forecasting tools. This competitive advantage can be achieved by enhancing your own forecasting capabilities with our QML-based asset price prediction model, which provides better performance compared to classical ML approaches.



FINANCIAL DERIVATIVES PRICING

With quadratic speed-up promises of QAE, derivative pricing has long been considered a prime example of fintech use cases, where quantum computing could soon generate sufficient value. Now that the limitations of NISQ-era hardware have been proven to render this algorithm inapplicable to large-scale problems, new approaches are being investigated to make quantum solutions viable as early as possible. Learn how we join this quest by introducing a QML technique, which exhibits considerable speed-up, yet efficiently cuts down on the required resources.

WHY SOFTSERVE

SoftServe is a premier IT consulting and digital services provider. We expand the horizon of new technologies to solve today's complex business challenges and achieve meaningful outcomes for our clients. Our boundless curiosity drives us to explore and reimagine the art of the possible. Clients confidently rely on SoftServe to architect and execute mature and innovative capabilities, such as digital engineering, data and analytics, cloud, and AI/ML.

Our global reputation is gained from more than 30 years of experience delivering superior digital solutions at exceptional speed by top-tier engineering talent to enterprise industries, including high tech, financial services, healthcare, life sciences, retail, energy, and manufacturing.

We partner with major technology players, such as Google Cloud Platform, Amazon Web Services, Microsoft Azure, Salesforce, and NVIDIA, to give clients a competitive advantage in the market.

LET'S TALK



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