

IN SIGHT

IN THIS ISSUE:

Why Firms are Rethinking their Risk Technology

Quantifi Accelerates Global Growth

Ellington Management Group

Quantifi Commended by Celent for PMS

WHAT ARE THE LATEST TECHNOLOGY TRENDS IN FINANCIAL MARKETS?





Message from the CEO

Are we nearing a tipping point for FinTech? Looking at some of Quantifi's recent publications, I am reminded how many radical, new technologies are reaching prime time in the financial markets. Some, like Machine Learning, Cloud, Big Data and CryptoCurrencies, will be familiar. Others, like Microservices, Lambda Architectures, In-memory computing and changes to CPU architectures, may not be. All have the potential for a huge impact on our industry.

These transformative technologies are coming at a junction where global financial firms are facing new challenges and opportunities - fuelled by changing investor demands, a low rate environment and new sources of competition and regulation. This issue's cover story provides insight into the disruptive technologies transforming the future of business. We also include findings from a survey that we conducted on what is driving firms to re-evaluate their risk technology. The survey was part of our recent webinar, featuring Celent - a leading research and advisory firm, on 'The Trends Shaping Portfolio and Investment Management Risk'.

In the Autumn issue of InSight, I commented on how 2018 was shaping up to be a record year for Quantifi. It turned out to be our strongest year to date, with over 60% growth in new business. We also saw a 96% client retention rate, which is a testament to our commitment to work closely with our clients. On the back of the success of 2018, we have had a great start to 2019. We are seeing an increasing number of firms replace their legacy systems with new solutions from Quantifi that leverage transformative technologies to provide integrated, flexible and tailored solutions adapted to their needs.

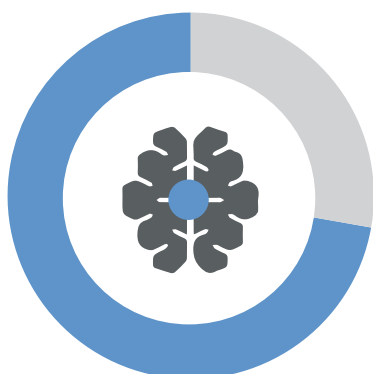
Over the last 12 months, we have broadened our client base globally with notable client wins and have a very strong pipeline. To support this growth and better serve our clients, we are undertaking new initiatives across the company to improve our client engagement model. We have also continued to re-invest in our solutions with several existing longer term projects that will keep Quantifi on the forefront of FinTech. In a recent report, Celent commended Quantifi for demonstrating a systematic and pragmatic approach in pursuing ongoing performance enhancements and evaluating new techniques to boost throughput across multiple fronts.

At Quantifi, open innovation plays a key role in developing technology that satisfies our clients' demands for ultra-fast, flexible technology that can harmonise operations and drive efficiencies. Our 2019 strategy and priorities position us well to continue collaborating with clients and apply our expertise to develop our solutions.

A handwritten signature in black ink, appearing to read 'Rohan Douglas'.

Rohan Douglas, CEO, Quantifi

CONTENTS



04

Why Firms are Rethinking their Risk Technology

New and emerging technologies are introducing innovative risk management techniques.



07

Quantifi Accelerates Global Growth

Growth in 2018 was driven by major client acquisitions and increase in recurring revenue.



10

Quantifi Commended by Celent for PMS

Recent Celent report evaluates front office portfolio and risk management solutions.

08

Ellington Management Group

"We believe that Quantifi will allow us to continue rapidly developing our credit business."

12

What are the Latest Technology Trends?

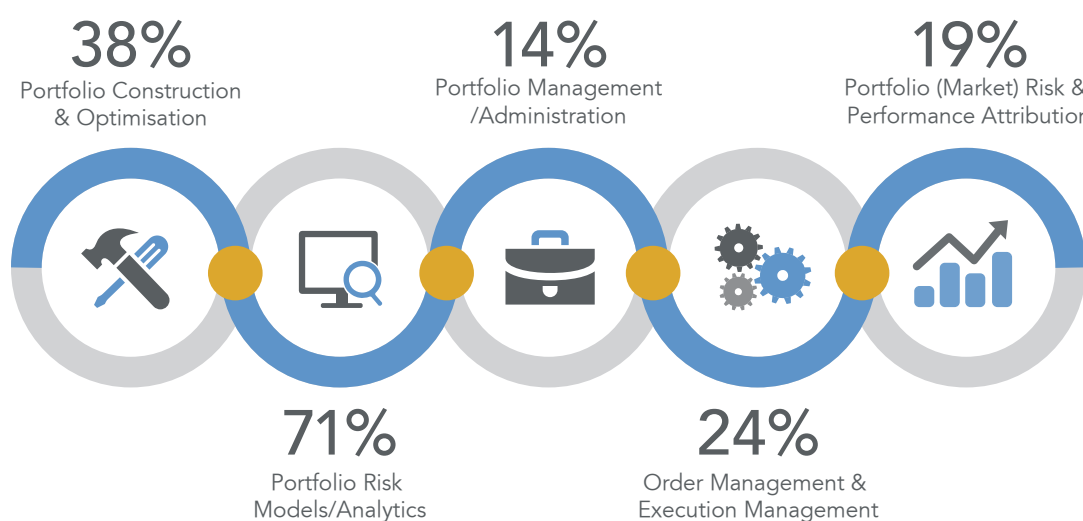
New technology brings significant benefits in usability, flexibility, scalability and performance.



Why Firms are Rethinking Their RISK TECHNOLOGY

As active managers search for returns and value-added alpha within a dynamic market besieged by low (but rising) interest rates, buy-side firms also face pressures from increased regulatory compliance and transparency requirements. Structural market changes, the influx of digital technologies, shifts in investor buying behaviour and performance/costs perceptions have also contributed to the radical changes taking place across the buy-side. This survey was conducted during a webinar Quantifi hosted, featuring Celent, on 'Trends Shaping Portfolio and Investment Risk Management'. Over 100 individuals from across the buy-side industry registered for the webinar. The key findings are outlined here:

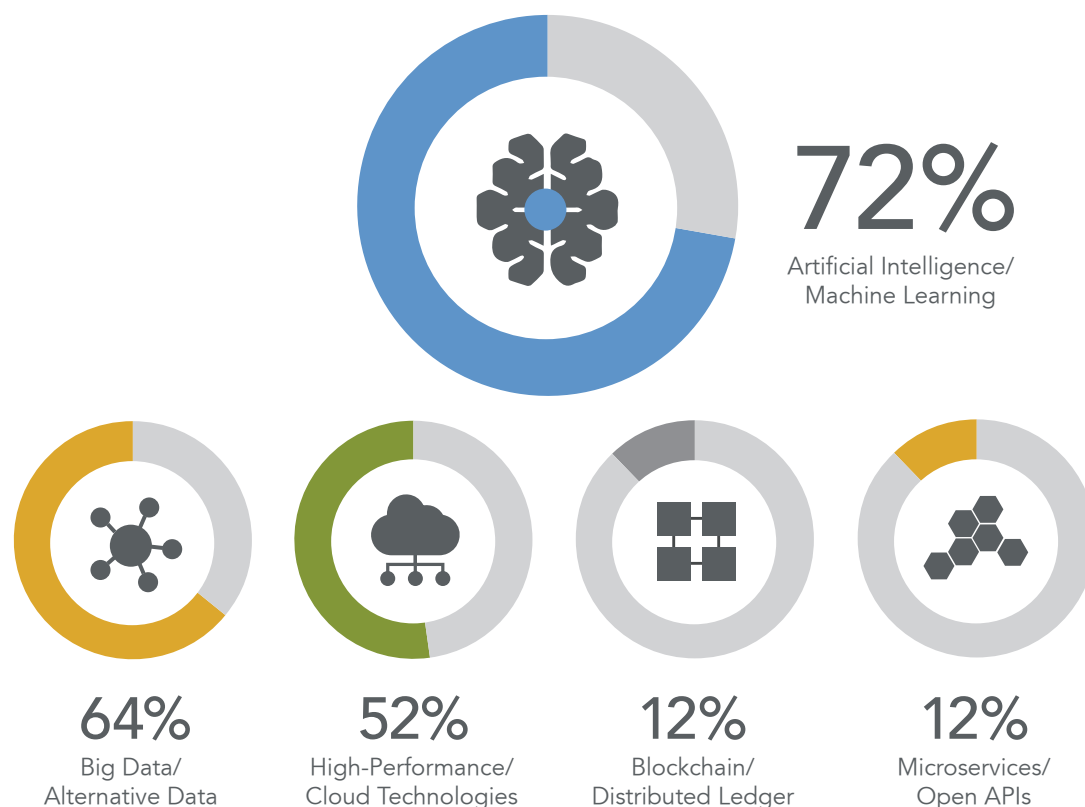
Which parts of the investment technology value chain do you see converging? Select 2.



The investment value chain is changing, triggered by regulation, emerging technologies and the digital revolution. As a result of these changes, there are specific areas within the buy-side ecosystem where convergence is taking place. To drive better investment decisions, firms are looking for technology that provides a consistent framework for multi-asset class analytics across front and middle office. Firms are demanding portfolio risk models/analytics (71%) that are interactive, real-time and consistent enterprise-wide.

A number of firms use different tools for portfolio construction and optimisation. However, given the change in investment strategies, the technology used for portfolio construction is fast converging (38%). Firms that want to optimise across different assets, are in need of a solution that can converge across various asset classes and handle multiple strategies. New and emerging technologies, such as artificial intelligence (AI) and big data, lend themselves well to this requirement.

Which technologies would have the most significant impact on portfolio & risk functions in the next 5 years?



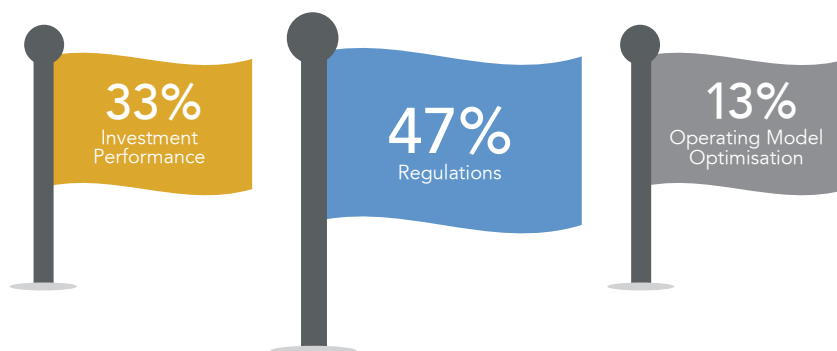
New and emerging technologies are introducing innovative risk-management techniques that help firms make better investment decisions faster, more efficiently and at a lower cost. AI/machine learning (72%) and big data (64%) are considered to be the key disruptors for the industry. The implementation of AI is well underway for many firms as they recognise that they need to adapt quickly or lose market share to more flexible and innovative competitors. The interplay between AI and big data is so connected that it can be difficult to separate the two. The effective use of AI largely depends on the scope and quality of data used to train algorithms, whilst without AI, insights locked within large datasets would remain undiscovered.

High performance (52%) is also high on the agenda. Technology advancements are causing firms to evaluate their existing, monolithic-based core architecture and look for alternative approaches

that can provide high-performance for reporting, data processing and analytics. This trend towards optimising solution architecture has encouraged firms to select technology providers that have embraced cloud strategies to address performance, flexibility and agility.

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What do you anticipate the main challenges for investment firms to be in 5 years' time?

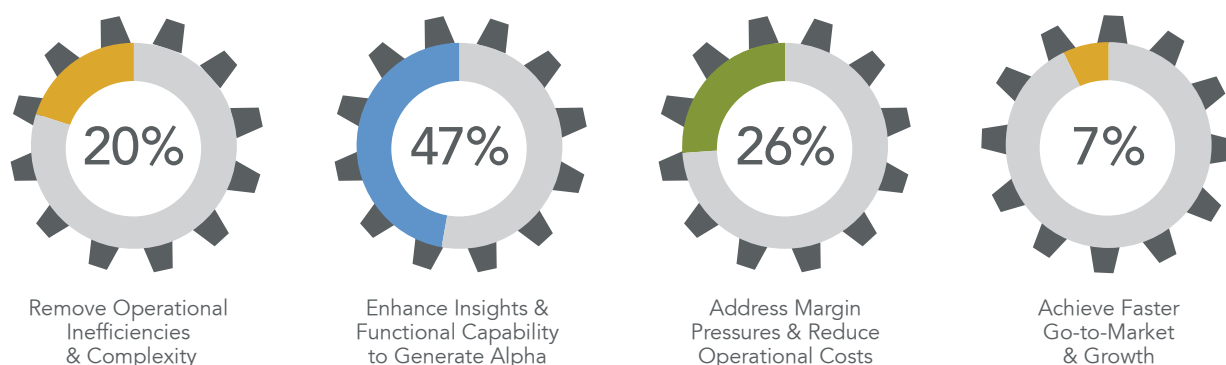


Whilst the global investment management industry has grown in recent years, the sector faces a number of challenges, with regulations (47%) and investment performance (33%) seen as the primary concerns. With MiFID II having come into effect in early 2018, new regulatory requirements are having a huge impact on the industry. In addition, new regulatory rulings will likely further complicate regulatory compliance in 2019.

The ability to generate alpha consistently is a key competitive benefit. In a market where competition is rife and alpha is elusive, it is no surprise that investment performance (33%) is a challenge. Firms are still likely to experience ebbs and flows due to low volatility environments caused by various factors including political risk i.e. the UK's exit from the EU.

Modern technology is key to developing new capabilities to drive better investment decisions as well as regulatory operations.

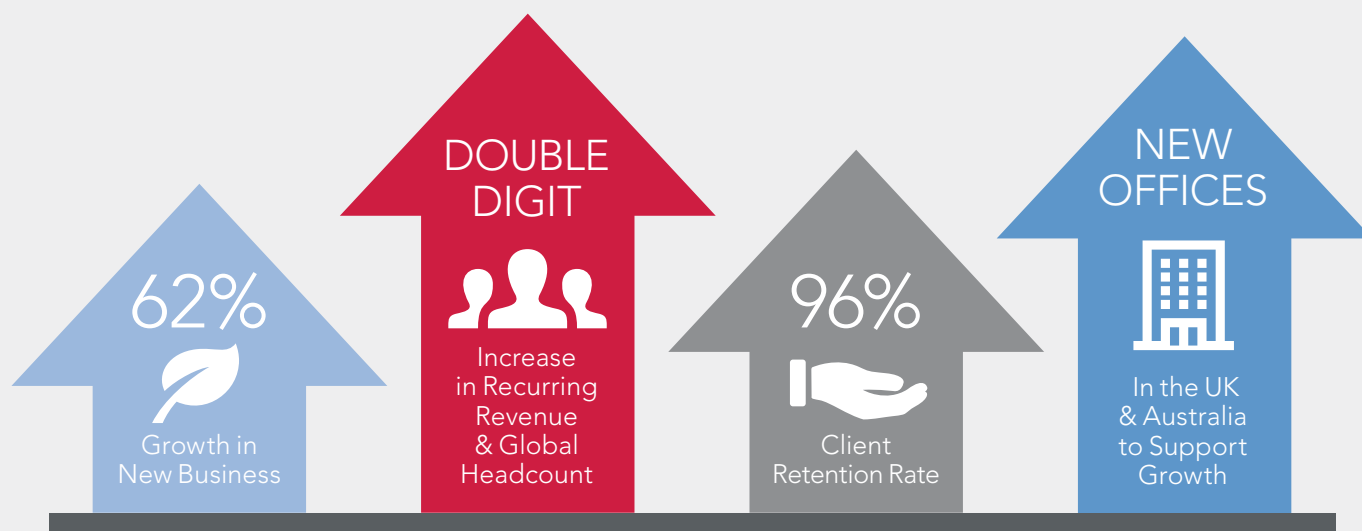
What do you see as the most compelling business case for changing investment and risk management technology/ops?



Investment towards the use of big data, coupled with other emerging technologies is likely to have important implications for the investment management value chain. Technology providers, like Quantifi, continuously look for ways to deliver more sophisticated, accurate insights so that firms can exploit information for strategic advantage and alpha generation.

As the pressure to reduce operational costs persists, firms are looking for technology that offers cost-saving opportunities to mitigate margin pressures (26%). Firms realise that legacy risk management systems demand significant resource and capital to ensure operations run smoothly. As a result, firms have started to rethink their operating costs by leveraging next-generation technology that can add more value at a lower cost.

QUANTIFI ACCELERATES GLOBAL GROWTH IN 2018 WITH NEW CLIENT WINS



In 2018, Quantifi had one of its strongest years to date, with growth of 62% in new business. Growth was further boosted by a significant increase in recurring revenue.

This growth was driven by major client acquisitions, such as a prominent global investment manager, one of the world's leading agribusinesses as well as expanded usage from its existing client base, including leading European banks. Quantifi also received recognition in a number of significant industry awards. In January, Quantifi was named Best Pricing & Analytics Product at the Risk.net Market Technology Awards and, in June, received the prestigious Red Herring Top 100 North America award.

"To maintain future growth, it is important that we continue investing in new technology to help deliver higher performance, reduce the time and cost of deployment and provide clients with a critical competitive advantage."

To support its growth strategy, Quantifi has invested in expanding and strengthening its client service and development teams. In 2018, Quantifi made significant investment in product innovation, releasing a number of new features and enhancements to asset coverage, functionality and usability. Quantifi also maintained its strategic focus on technology investment and is in the process of transforming its technology stack to true cloud, extending the use of open source components, and leveraging Big Data and AI technologies.

"2018 was a landmark year for Quantifi, with strong revenue growth, high retention rate, numerous industry awards, and notable global client wins," comments Rohan Douglas, CEO, Quantifi. "In an increasingly competitive and complex global environment, our clients are looking to become more agile and efficient. To maintain future growth, it is important that we continue investing in new technology to help deliver higher performance, reduce the time and cost of deployment and provide clients with a critical competitive advantage."



ELLINGTON MANAGEMENT GROUP SELECTS QUANTIFI TO HELP GROW THEIR CREDIT BUSINESS

Ellington Management Group, an investment and advisory firm, has selected Quantifi to enhance the risk management and reporting functions for its growing credit business.

The global economy is experiencing one of the longest periods of expansion on record, and credit remains one of the more appealing sources of income in financial markets. With Ellington's focus on credit, the firm was looking for widely recognised risk analysis solutions to use alongside its proprietary models to support its existing portfolio and take advantage of new opportunities. Ellington required a technologically advanced solution with the capacity to handle a broad range of instruments and provide detailed reporting, all while interfacing with Ellington's existing portfolio analytics.

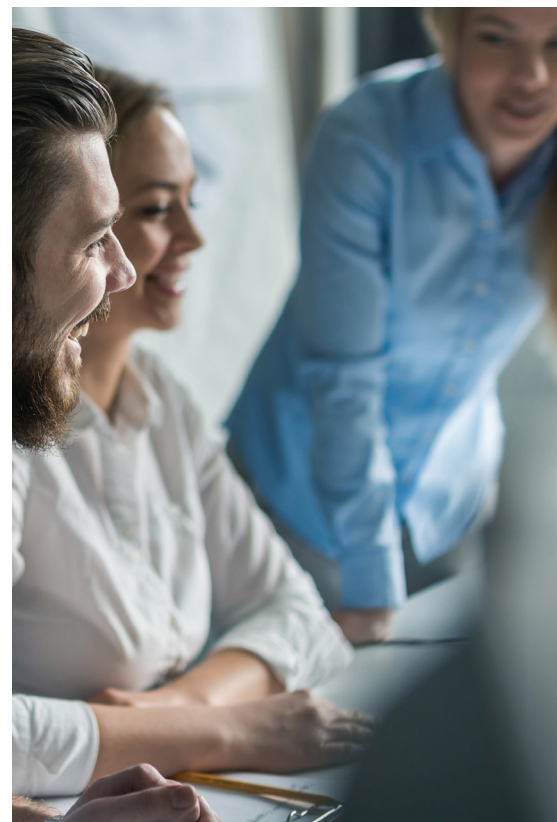
"Since Quantifi is used by such a wide range of market participants, we saw significant value in seeing the same standardised model results as the firms we trade with. On top of that, Quantifi comes with great Excel add-ins and APIs that allow us to quickly prototype new analytics and integrate with our proprietary models. We can also leverage on Quantifi's existing reporting capabilities and user interfaces, which saves us time and money and allows us to focus our software

development efforts on what makes our strategies unique," comments Laurence Penn, Vice Chairman and COO, Ellington Management Group. "We believe that Quantifi will allow us to continue rapidly developing our credit business as we seek new opportunities in this space".

"SINCE QUANTIFI IS USED BY SUCH A WIDE RANGE OF MARKET PARTICIPANTS, WE SAW SIGNIFICANT VALUE IN SEEING THE SAME STANDARDIZED MODEL RESULTS AS THE FIRMS WE TRADE WITH."

For investment managers, Quantifi delivers cross-asset trading, front-to-back operations, position management, market, credit, liquidity risk management and regulatory reporting all on an integrated platform. As well as supporting the key regulatory requirements, Quantifi applies the latest technology innovations to provide new levels of usability, flexibility and ease of integration. This translates into dramatically lower time to market, lower total cost of ownership, and significant improvements in operational efficiency.

"We are pleased to be working with Ellington Management Group to help them address their risk management requirements. With a proven track record of delivering the most sophisticated models with advanced functionality, Ellington Management Group is just one of several new funds using Quantifi," comments Robert Goldstein, Director, Client Services, North America. "With financial markets becoming more complex, investment managers are demanding a more robust and flexible infrastructure for investment operations. Our integrated cross-asset platform helps clients enhance performance, strengthen risk and improve operational control".



ELLINGTON
MANAGEMENT GROUP

QUANTIFI COMMENDED BY CELENT FOR ITS ADVANCED TECHNOLOGY AND PORTFOLIO MANAGEMENT FUNCTIONALITY

In a recent report 'Next Generation Portfolio and Investment Risk Capabilities,' Celent, a leading research, advisory and consulting firm, evaluated front office portfolio and risk management solutions.

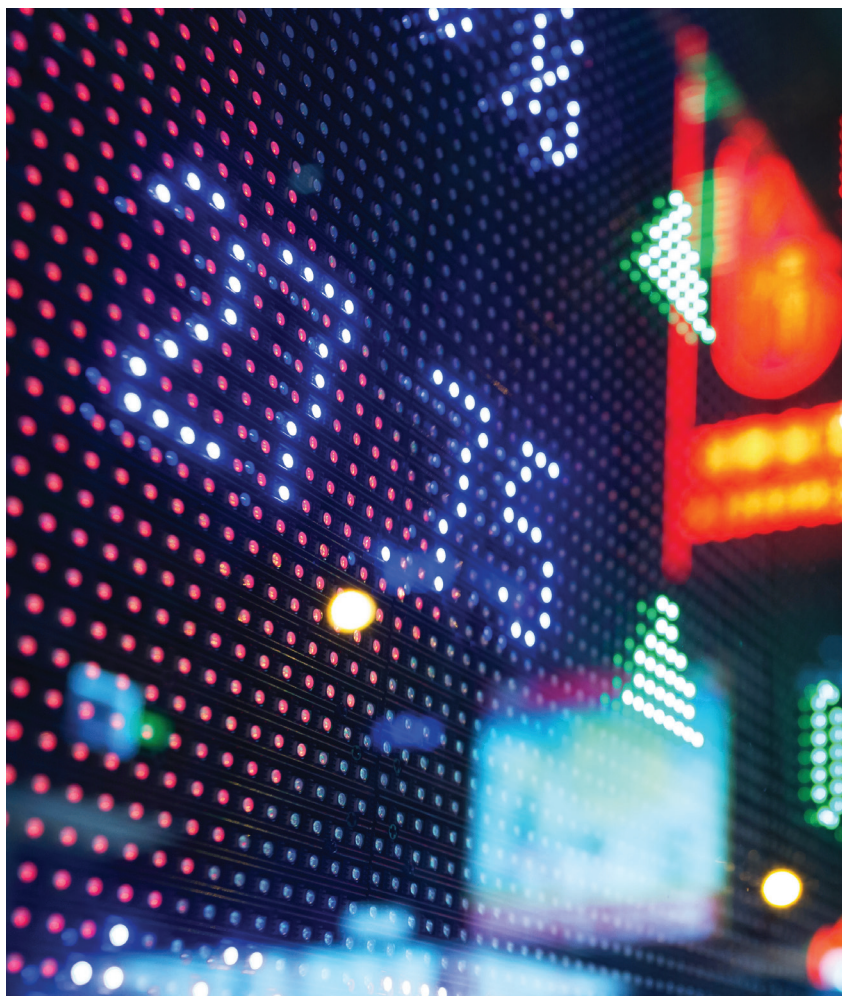
The report examined strengths related to portfolio design, construction and optimisation functions, investment decision support analytics, investment forecasting and simulations and support for risk budgeting activities. It was noted that Quantifi's architecture and functionality are built cohesively "from the ground up" as a front-to-risk-to-back application optimised on open, industry-standard hardware/software stacks and underpinned by its loosely coupled microservices foundations to improve flexibility, increase performance, and lower costs of technology deployments.



"For our notable commendations, we praise Quantifi for its ability to stay ahead of analytical developments and support complex cross-asset portfolios with diverse investment strategies, total and absolute return mandates and structured fixed income investment portfolios including MBS, ABS, loans and hybrids. Quantifi has demonstrated a systematic and pragmatic approach in pursuing ongoing performance enhancements and evaluating new techniques to boost throughput across multiple fronts — algorithms, software, and hardware," comments Cubillas Ding, Research Director, Celent.

Quantifi's front-to-back portfolio management system (PMS) for the buy-side delivers cross-asset trading, front-to-back operations, position management, market, credit and liquidity risk management as well as regulatory reporting. As well as supporting the key regulatory requirements, Quantifi applies the latest technology innovations to provide new levels of usability, flexibility and ease of integration. This translates into dramatically lower time to market, lower total cost of ownership and significant improvements in operational efficiency.

"We are delighted to be recognised by Celent for our advanced technology and analytics," comments Rohan Douglas, CEO, Quantifi. "The buy-side industry is changing on many fronts. Investor behaviour,



"FOR OUR NOTABLE COMMENDATIONS, WE PRAISE QUANTIFI FOR ITS ABILITY TO STAY AHEAD OF ANALYTICAL DEVELOPMENTS AND SUPPORT COMPLEX CROSS-ASSET PORTFOLIOS WITH DIVERSE INVESTMENT STRATEGIES."

new regulation and expanding competition are just a few of the drivers. "We are seeing a growing trend in firms looking for client-centric solutions that can adapt to their particular investment strategies and processes, rather than forcing a one-size fits all approach. Firms that adopt

solutions-centric software, like Quantifi, are able to implement faster, reduce risk, reduce costs and more rapidly take advantage of market opportunities".

CELENT

WHAT ARE THE LATEST TECHNOLOGY TRENDS IN FINANCIAL MARKETS?



Technology is transforming the future of business. New, disruptive technologies including AI, Big Data, Cloud, Microservices, Modern CPUs, In-Memory Computing, Lambda Architecture and Blockchain have the potential to radically re-shape how firms operate. Quantifi is on the forefront of these changes and our advanced architecture and significant investment in R&D provides our clients with the latest innovations and a significant competitive advantage.

TECHNOLOGY TRENDS

ARTIFICIAL INTELLIGENCE (AI)

Innovation in AI and Machine Learning has the potential to disrupt financial services. AI is already being applied across a wide range of applications including asset management, insurance and trading.

MODERN CPUs

Modern CPUs are increasing the number of cores and adding support for SIMD. Software needs to be designed from the ground up to support multi-threading and vectorisation to deliver higher performance.

BIG DATA

Big Data is larger, less structured and more complex data that cannot be managed with traditional methods. There is a rapidly evolving landscape of new tools and approaches designed to process and analyse complex data to gain new investment insights and improve efficiencies.

IN-MEMORY COMPUTING

In-Memory Computing enables large sets of data to be analysed thousands of times faster than traditional approaches. Analysis of this complex data at an unparalleled speed allows users to respond to market events with speed and efficiency.

CLOUD COMPUTING

Cloud Computing is the delivery of on-demand computing services over the Internet on a pay-for-use basis. This reduces operating costs, increases efficiency and improves scalability as your business needs change.

LAMBDA ARCHITECTURE

Lambda Architecture is a unified, scalable and fault-tolerant data-processing architecture designed to handle huge quantities of data in an efficient manner by splitting it into both batch and real-time processing.

MICROSERVICES

Microservices are small, API-accessible, single-purpose components that allow functionality to be consumed in ways most applicable to client requirements. Flexibility, reliability and scalability are just some of the benefits associated with microservices.

BLOCKCHAIN

Blockchain or distributed ledger technology will create a more efficient, more transparent and more secure marketplace whilst reducing transaction processing costs and improving operational efficiency.

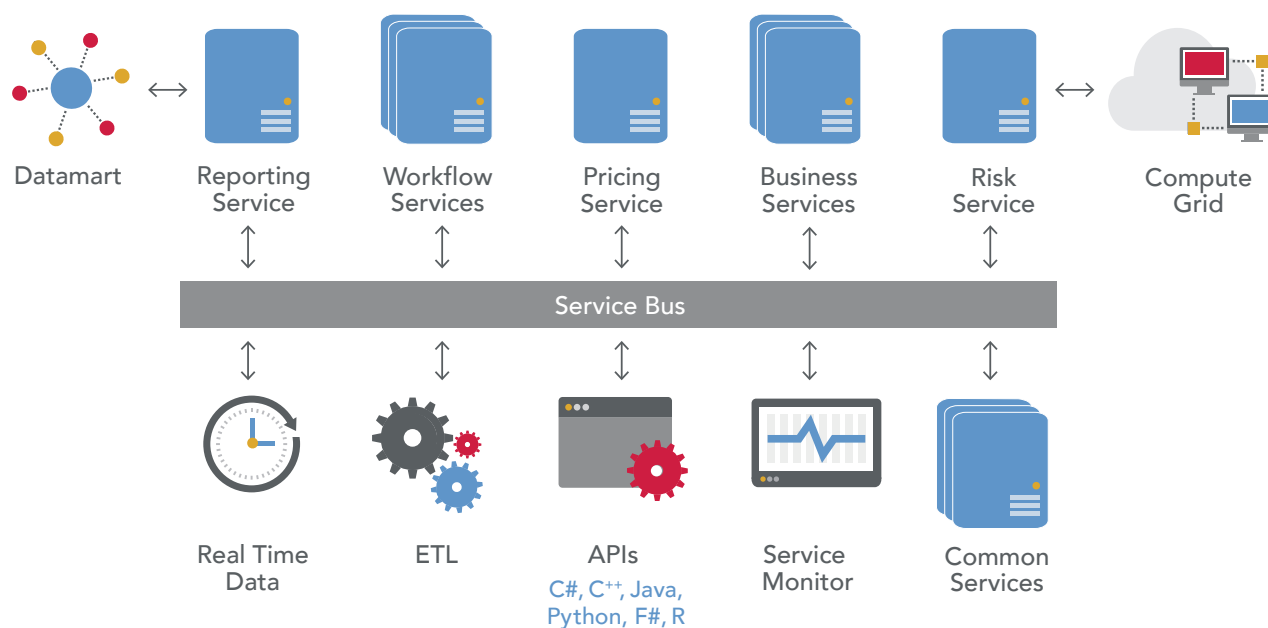
Adapting to Emerging Technologies

Firms can struggle with inflexibility and the high maintenance cost of legacy systems built on technology that is no longer fit for purpose. Quantifi's new technologies bring significant benefits in usability, flexibility, scalability and performance whilst providing the tools needed to support new regulatory and business requirements at a lower cost.

As a leader in financial technology, our forward-thinking approach and pace of innovation allows us to align our technology strategy with emerging technologies. This approach has a significant impact on our ability to rapidly turn around enhancements and new features. Unlike systems saddled with years of legacy code, our solutions

are designed from the ground up using the latest and most advanced technology and design patterns. This approach has given our clients considerable performance advantages.

New technology, like Quantifi, brings significant benefits in usability, flexibility, scalability and performance whilst providing the tools needed to support new regulatory and business requirements at a lower cost.



A new generation of technology holds the promise of disruptive changes, which will redefine what is possible and deliver significantly better functionality at a much lower cost. Firms who ignore this risk being obsoleted by those who gain a significant competitive advantage from these technologies.

Quantifi understands the challenges our clients face and through a sustained investment in R&D, we are able to adopt new technologies that provide higher performance, more functionality, lower total cost of ownership, lower operational risk and more accurate results. Quantifi continues to make smart investments in new technology that translates into long-term value for our clients.

MICROSERVICES ARCHITECTURE

We allow functionality to be consumed in ways suited to a client's unique requirements. Components within a microservices architecture are loosely coupled, making them more flexible, reliable and responsive to change. A microservices architecture has the ability to scale vertically and horizontally from small, single desktop deployments to fully integrated enterprise deployments.

HIGH PERFORMANCE PRICING AND REAL-TIME RISK

In rapidly changing markets, you need fast, accurate answers to make the right decisions. Quantifi is built using advanced technology and Lambda Architecture design patterns that leverage modern CPUs and Cloud Computing to deliver scalable, ultra-high performance for real-time monitoring of risk.

BUSINESS INTELLIGENCE AND REPORTING

There is high demand for self-serve business intelligence tools that support risk management and data visualisation. Quantifi's real-time dashboard and reporting engine is based on an in-memory datamart which leverages technology from the open-source Big Data community.

RICH APIs

Language agnostic APIs provide an open platform that sets a new standard in extendibility, flexibility and customisation. Clients have access to the tools and APIs used by Quantifi to allow them to customise and extend our solution in ways that are supportable and scalable.

FLEXIBLE ETL

Our next-generation ETL layer provides rapid and robust bi-directional interfacing, with external data sources, using a wide variety of formats. Its flexibility translates into significantly faster and more robust integration.

CROSS-PLATFORM

Support for Microsoft Windows, Linux and MacOS provides greater flexibility and scalability for deployment and is an integral part of our cloud strategy.

WORKFLOW AUTOMATION

Quantifi comes with a powerful framework for implementing durable, customisable workflow services that automate business processes and simplify operations. The workflow engine has an intuitive GUI and provides simple interfacing with external systems along with full control over security and permissions.

Quantifi continues to make smart investments in new technology that translates into long-term value for our clients.

Quantifi Webinar Featuring Celent

New challenges in the financial markets, driven by changes in market structure, regulations and accounting rules, have increased the demand for higher performance risk and analytics. This demand has put a focus on how to get the most out of the latest generation of hardware. This webinar explores the trends and market dynamics impacting front office portfolio & investment risk technologies.

Topics Covered:

- The investment trends driving change in portfolio and investment risk management
- The impact of technology evolution - near term vs long term
- Key considerations when enhancing risk management capabilities
- Important takeaways for investment management firms



www.quantifisolutions.com/trends-shaping-portfolio-and-investment-risk-management-video



Whitepapers

- Understanding the Cryptoasset Market
- Blockchain Technologies in Financial Markets
- FRTB: Moving Towards a Practical Implementation
- Vectorisation: The Rise of Parallelism
- Microservices: The New Building Blocks of Financial Technology
- Identifying Liquidity Risk for Financial Stability
- Cost of Trading and Clearing in the Wake of Margining

www.quantifisolutions.com/whitepapers

About Quantifi

Quantifi is a provider of risk, analytics and trading solutions. Our award-winning suite of integrated pre and post-trade solutions allows market participants to better value, trade and risk manage their exposures and responds more effectively to changing market conditions.

Quantifi is trusted by the world's most sophisticated financial institutions including five of the six largest global banks, two of the three largest asset managers, leading hedge funds, insurance companies, pension funds and other financial institutions across 40 countries.

Renowned for our client focus, depth of experience and commitment to innovation, Quantifi is consistently first-to-market with intuitive, award-winning solutions.

enquire@quantifisolutions.com | www.quantifisolutions.com

EMEA +44 (0) 20 7248 3593 NA +1 (212) 784 6815 APAC +61 (02) 9221 0133

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