Delivering quality for financial infrastructure firms

Demonstrating value to drive engagement
QA Vector® Insights from this Study

More than 50% of quality and technology leads struggle to engage business leaders in quality planning

Lack of business engagement inhibits funding and execution:
• DevOps is underway but very incomplete
• Poor test data management is the source of many problems

Addressing skills gaps is the primary reason to outsource for 73% of financial firms

While outsourcing entails increased due diligence and a learning curve for the vendor, it accelerates time-to-market and reduces project risk

More than 80% of firms give the same test priority to all applications, failing to differentiate between levels of risk of failures

Identifying QA priorities is critical. Instead of prioritising what could bring down the business, firms often give the same test priority to all applications.

Nearly 70% of respondents claim to be prioritising use of AI but there are limited operational applications

Firms state that they prioritise use of AI but their application is focused on so-called foundational automation, perhaps more RPA than AI.

Some 10% of firms are exploring blockchain projects, generally by investing in others or simple proofs of concept

Blockchain initiatives are generally proofs of concept and not directly core to software development; for now, being DLT-ready is enough.

Around 40% engage with FinTechs, initially as a defensive ploy but some to fast-track their own development

FinTechs are providing new challenges, opportunities: traditional firms often choose to partner with them as fast-tracks to solutions.
Covering skills gaps is the principal reason that 73% of firms engage with external vendors.

Quality leaders face increasing complexity, regulatory pressure and business demand; inhibited by skills gaps, legacy exigencies and lack of funding.

Strategic funding, quality process evolution and test data management concerns set the framework against which quality leaders are developing their tactical priorities for the coming 12 to 18 months.

Financial firms are increasingly seeking external engagements to:

- enable mission-critical assurance
- embed foundational automation and
- explore AI-enabled risk management

This QA Vector® Insight paper, sponsored by Exactpro Systems, looks at the market challenges for quality at financial infrastructure firms, the struggle to demonstrate value and lessons learned along the road and improve overall software performance.
Quality leaders’ strategic concerns

Demonstrate value to drive engagement

Effective engagement with the business is required to evolve the quality dimension

Quality leaders struggle to achieve effective engagement and sponsorship from business leaders in their corporate structure.

More than 50% of quality leaders at financial firms struggle with this issue, resulting in funding and execution issues. This lack of business engagement with QA increases operational and regulatory risks.

Typical roadblocks to demonstrating the value of QA to the wider enterprise – inhibiting a corporate view of QA – include those depicted in figure 1.

Quality leaders need to demonstrate a clear path from investment to margin retention (i.e. by avoiding a regulatory breach) for business leaders to allocate effort and resources to QA.

One pathway is to estimate and articulate the potential regulatory cost of a quality failure and the benefits of investment in the quality dimension.

By investing a small portion of any potential fine into improved QA, margin is preserved and enabling processes, systems and data management evolution. Ultimately, this investment delivers real benefit to overall QA benchmarks and software performance.

To build momentum and gain support, quality leaders should deliver tactical, low-impact solutions, such as automating part of the risk reporting process.

Failing to improve business engagement and secure funding ultimately leads to greater risk of regulatory breach, due to increasing:

- legacy maintenance effort
- process complexity
- interoperability issues

Addressing business engagement will create renewed focus for quality process evolution and better test data management.

“Generate traction with tangible concepts – avoid discrepancies and regulatory penalties using automation.”

– Chief Data Officer, Custodial Bank

Figure 1 – obstacles inhibiting priority for QA at an enterprise level stem from inconsistent benchmarking of the value of QA, antiquated processes and poor data management.
Quality leaders’ strategic concerns

The DevOps journey is under way

Quality process evolution depends on effective culture, toolchain and process change

Efforts to embed DevOps practices firm-wide are in progress, but the journey is very incomplete.

For almost 60% of firms, DevOps is a direction of travel, rather than a specific near-term endpoint. More than half indicate three or more years remain on the journey, though in around 30% of cases, the initiative is evolving into a firm-wide program.

When corporate stakeholders across business, DevOps and Agile functions see value and invest in this transformation, quality outcomes benefit.

The key for quality leaders is demonstrating to their corporate stakeholders how pursuing DevOps delivers a clear path to margin retention.

However, if the priorities of any of these functions conflict, the transformation risks grinding to a halt, shown by figure 2.

Aligning to corporate priorities is essential to deliver this quality process transformation - approximately a quarter of firms are embracing a DevSecOps culture to integrate security and compliance priorities.

In these cases, the target benefits include:

• handling increased complexity
• improving regulatory compliance
• better open-source liability management

Environment provisioning remains an unexplored opportunity for roughly two-thirds of financial firms. Foundational automation - described in more detail later - is emerging as a potential solution.

Partnering with the business, compliance and external QA specialists will enable quality leaders to accelerate their DevOps maturity, resolve data governance issues and deliver better quality software, faster.

“Breaking new boundaries with DevOps brings regulatory risk.”
– Head of DevOps, Custodial Bank

Figure 2 - without alignment between stakeholder priorities and Agile/DevOps objectives, these transformations risk grinding to a halt.
Quality leaders’ strategic concerns

Poor data management is the root of many problems

Data ownership, portability and privacy are critical roadblocks to quality process effectiveness

**Innovative systems of engagement are placing increasing strain on legacy systems of record, compounded by the accelerating shift to the cloud.**

Approximately 60% of quality leaders recognise the need to foundationally rationalise their data governance arrangements. Complex data ownership arrangements have resulted data quality issues at production for around 10% of customer records.

Many quality leaders – recognising the reputational and operational impacts of their existing data management techniques – are endeavouring to resolve opaque data lineage and governance issues, as depicted by figure 3.

Approaches observed include:

- modelling complex data flows
- refactoring data platforms onto cloud
- rebuilding effective test rigs

Many firms are leveraging microservices approaches to resolve data portability concerns, through hybrid cloud arrangements to mitigate vendor lock-in.

As data privacy directives take hold in Singapore, California, Indonesia and across the EU, data portability will become business-critical for how financial firms develop their test data management strategies.

In recent times, there have been a few cases of quality leaders directly engaging with regulators to develop data privacy solutions, enabling these global firms to:

- reduce cross-jurisdictional risk
- improve comfort with outsourcing

To keep pace with regulatory directives and maintain competitiveness, quality leaders must rationalise their end-to-end processes and test data management.

We are developing data privacy solutions for pre-trade and post-trade with regulators.

– Head of DevOps, Custodial Bank

Figure 3 – financial firms face tangible operational and reputational risks in the absence of an effective test data management strategy.
Tactical priorities that result for quality leaders

Faced with these three strategic issues, quality leaders must tactically evolve their benchmarking practices and activity prioritization to demonstrate value to corporate stakeholders.

We investigate these two priorities and make recommendations for how quality leaders can embed these initiatives into their organisation.
Tactical priorities that result for quality leaders

Measure the impact of QA on overall software performance

Elevating the value of the quality dimension to the enterprise relies on effective performance-led benchmarks

Firms apply formal benchmarking to the end-to-end QA function in less than one in four cases.

Firms measure the means – not the ends – of the QA, reporting on specific test outcomes but not how well QA as whole is improving overall software resilience, as depicted by figure 4.

The lack of standardised value benchmarks (quality process analytics) increases the risk of:

- inefficient processes
- regulatory impact

Demand for evidence of strategic software quality principles is increasing in context of a range of constantly changing – and often poorly defined or evolving – regulatory pressures, such as, but not limited to, MiFID, FRTB and GDPR.

As a result, more than a third of institutions operating in Asia are pursuing improved regulatory alignment, aspiring to emulate the practices of a Tier 1 exchange.

Informal – or absent – value analytics are symptomatic of limited adoption of mission-critical assurance.

To demonstrate the value of QA to corporate stakeholders, quality leaders must establish formal, comparative benchmarking across the quality dimension for effort, customer impact and return on investment.

These benchmarks serve also as a framework on which to accelerate software intelligence, increasing operational knowledge about and risk management strategies for code quality exceptions.

"Dynamic quality processes and consistent engagement with regulators are key to remaining compliant."
- Business Transformation Leader, Custodial Bank

"We don’t track our processes."
- Head of IT, Clearing House

"Regulators want evidence of software quality and governance."
- Head of QA, Exchange

Figure 4 – financial firms need to evolve QA measurement practices beyond code coverage to benchmark the overall impact of QA on software performance.
Tactical priorities that result for quality leaders

Identify mission-critical priorities for QA

Avoiding the proverbial ‘airline crash’ requires quality leaders to prioritise critical applications

Over 80% of firms give the same test priority to all applications, resulting in critical risk areas being only superficially investigated and remediated.

Identifying QA priorities is critical; instead of prioritising what could bring down the business, financial firms often give the same test priority to all applications.

Securing improved engagement (and therefore funding) from business stakeholders relies on quality leaders being able to deliver valuable software quality insights. Delivering these insights executes on the path to margin retention.

Quality leaders – presented with a choice between trying to cover everything or focusing effort on mission-critical activities – must decide on the most effective QA strategy.

The difference between mission-critical assurance (avoiding the proverbial “airline crash”) and incremental gains (trying to achieve 100% code coverage and remediation) is depicted by figure 5.

High profile failures of the software quality process – such as the collapse of TSB’s online banking platform – illustrate the mission-critical areas quality leaders need to focus their effort.

Avoiding potential wipe-outs by design – and increasing software intelligence – must become the priority for financial firms.

In place of attempting – and failing – to cover everything, quality leaders should evolve their QA strategy to:

- identify and target mission-critical activities
- investigate and remediate these activities
- apply foundational automation to deliver baseline assurance

Mission-critical assurance shifts the value conversation with the business by increasing overall reliability of critical applications. Together with improved benchmarking, this strategy enables quality leaders to demonstrate a clear path to revenue retention.

“Most activity is not mission-critical, we focus on high-risk applications.”

– Chief Information Officer, Interdealer Broker

“We design our testing strategy around the mission-critical priorities.”

– Head of Production, Exchange

Figure 5 – quality leaders must focus their organisation on the mission-critical applications to avoid high profile software quality failures.
Increasing the value of QA to the business, pursuing quality process transformation and overcoming poor data governance drive quality leaders to evolve workstream prioritisation and benchmarking practices.

We explore three quality process enablement approaches emerging for financial firms and make recommendations about the path forward.
Quality process enablement

AI-enabled QA is a priority for most firms

Quality leaders aspire to deploy advanced learning algorithms to enable improved software performance

Nearly 70% of firms indicate they prioritise use of AI in QA, but there are few practical examples.

The value of QA to the business is benchmarked on the performance of high profile – mission-critical – applications. This, in addition to increasing complexity and process change, leads to quality process enablement challenges.

Though embedding AI-enabled practices in the quality dimension is a stated enablement priority for most firms, few practical examples exist in the SDLC today. Rather, we see RPA often labelled as AI.

Potential benefits to the SDLC of "real AI" may include improved:

• software risk management
• QA process effectiveness
• mission-critical assurance

One of the few cases of true AI we encountered in the software risk management journey involves a pilot program for improving test data quality.

Using AI-enabled data cataloguing, dictionaries and matching, data quality issues are identified and resolved. Across multiple silos and jurisdictions, the program is harmonising data management and delivering improved software intelligence. Previously data lineage and meaning was opaque.

In this case, AI truly shines a light on critical software risks, reducing the risk of regulatory penalty from poor data governance.

Quality leaders aspiring to foundationally reinvent the quality process journey often talk about the operational benefits of these advanced learning algorithms.

Many are seeking to engage with skilled domain experts or full-service consultancies to define and execute on these priorities.

Ultimately, effective application of AI in the software quality journey will enable financial infrastructure firms to pursue mission-critical QA strategies.

Data quality issues arise from legacy systems and ineffective processes.
– Chief Data Officer, Custodial Bank

All of our QA processes use AI to identify patterns.
– Executive Director (Technology Risk), Custodial Bank
Firms are still grappling with foundational automation

Quality leaders are struggling to increase effective automation rates in light of forthcoming regulatory pressure

Nearly 50% of quality leaders at financial firms prioritise embedding foundational automation into the QA process.

For most, embedding foundational automation into the quality process journey delivers enhanced agility (depicted by figure 6); enabling quality leaders to deal with increased:

- regulatory pressure
- software assurance complexity

Full-stack automation – applying these techniques across the end-to-end quality process – is a work in progress.

Foundational automation is yet to:

- address environment provisioning
- significantly improve software intelligence

But for more than 40% of firms, forthcoming regulatory directives cause unease.

Ultimately, these firms aim to evolve towards predictive software risk management, seeking outcome-based engagements to accelerate effective automation rates and remain compliant, based on:

- three to six month engagements
- four to six week handover periods
- targets for residual skills uplift

Increasing effective automation rates in tandem with residual skills uplift will enable quality leaders to pursue mission-critical QA strategies and deliver value to the business.

We are waiting to see what directives the Fed gives banks for automated processes.  
– Business Transformation Leader, Custodial Bank

There needs to be an effective outsourcing plan – automating 700,000 test scripts delivers no real value.  
– Head of QA, Exchange
Quality process enablement

DLT is not directly core to the SDLC

Few practical applications exist for DLT in the SDLC today, with complex challenges to overcome

Around 10% of firms are exploring blockchain-led initiatives, driven from outside of the quality dimension.

Blockchain initiatives are generally proofs of concept and not directly core to software development.

Primary inhibitors to greater adoption of DLT in the quality dimension are issues with:

• external interconnectivity
• process integration
• poor data governance

DLT-enabled QA techniques have prospective long-term potential.

A blockchain-led quality process transformation could lead to firms enabling QA outcomes via a distributed testing model. Decentralised testing may enable firms to increase testing velocity, coverage and ultimately, improved mission-critical assurance.

The Hong Kong Monetary Authority’s trade finance application illustrates the potential for this approach.

However, achieving this transformation relies on resolving complex interconnectivity and integration issues, along with a requirement for a data management revolution to occur.

For now, foundational automation and AI-enabled software risk management have greater near-term potential for quality process enablement. Being DLT-ready is enough.

"Blockchain is an artificial market being created by hype on the internet."
- Global DevOps Lead, Custodial Bank

"We have an incubator looking at the regulatory possibilities for DLT."
- Director of Quality Engineering, Exchange
Strategic outsourcing engagements

Enabling quality process outcomes relies on financial firms having the right mix of skills, domain expertise and evaluate available cost, quality and return profiles.

We investigate traditional and emerging engagement models and provide best practices.
Strategic outsourcing engagements

Outsourced quality process enablement

Many financial firms seek skilled domain experts to deliver effective quality outcomes

Addressing skills gaps is the primary reason to outsource for 73% of financial firms.

For some firms, contracting external domain experts is critical to accelerate process and people change, deliver QA transformation and improve the value of QA to the business.

Concerns expressed about offshoring cluster around:

- data management and sovereignty
- effectiveness and communication

Though external providers can accelerate time-to-market, cost-versus-quality is a conundrum for many institutions.
Approximately 50% of firms express a need for increased diligence when managing offshore resources.

Quality leaders must set a mix of outcome-based engagements with QA process outsourcers and benchmark the overall impact of external resources on software performance.

By setting these engagements, financial firms will realise improved value from QA and begin to address the cost-versus-quality conundrum.

"Distance makes communications with offshore resources more difficult."
– Head of Testing, Enterprise and Digital, Exchange
FinTech: providing new challenges and opportunities

A round 40% of incumbents seek first to engage with FinTech firms defensively; subsequently to embed innovation and attract talent.

FinTech is providing new challenges, opportunities: traditional firms ultimately choose to partner with them as fast-tracks to solutions.

Regulatory innovation gives rise to the process dynamism – an ability to change course and quickly embed new ways of working – of FinTech.

These start-ups face comparatively less regulatory pressure (demand for evidence of software risk management) and legacy issues.

FinTech firms are muscling into the financial services landscape by delivering innovative solutions to capture revenue, talent and customers.

In the fight to defend against these start-ups, some institutional quality leaders are pursuing co-creation initiatives with FinTech firms.

Incumbents are securing low-cost competency centres and attracting talent that would otherwise be captured by FinTech.

Figure 7 depicts the range of quality process outsourcing engagements in financial services – and the opportunity for quality leaders at incumbent firms.

“FinTechs have the upper hand; they don’t have the same regulatory pressures.”
– Business Transformation Leader, Custodial Bank

“Regulators are keen to embrace new ways of working.”
– Head of DevOps, Custodial Bank

“Emulating the proposition of full-service consultancies, co-creation with FinTech firms forms another avenue to quality process enablement for institutions. These consultancies are responding by building out their FinTech teams. Quality leaders can take advantage of this paradigm shift to overcome technical debt, embed innovative quality process enablement and deliver increased value to the business.”

Partnering with innovative start-ups is a fast-track to innovative quality process enablement

Figure 7 – typical quality process outsourcing engagements present in the financial services ecosystem today.
Based on our QA Vector® Impact methodology, we present our latest QA Vector® Impact Quadrant.

Contact us for further details or to arrange a specific evaluation for your needs.
Delivering high impact software QA outsourcing

Financial firms seek effective outcome-based engagements with deep domain experts

More than 50% of financial firms see Exactpro Systems as a domain expert; although roughly 30% are concerned with offshoring in general.

Based on our QA Vector® Impact methodology, we have analysed the overall impact of vendors serving financial infrastructure firms.

Quality leaders prefer to engage with a mix of QA specialists and full-service consultancies for their quality process outsourcing needs.

Exactpro Systems (see figure 8) in particular have a highly regarded software quality service targeted at financial institutions.

Clients compare Exactpro favourably against full-service consultants. No-one against whom Exactpro is compared competes with a like-for-like offering, but they do compete for spend and choice of execution process and partner.

Priced competitively against specialist QA providers like Tricentis or Parasoft and pure-play SIs including Infosys and HCL, Exactpro Systems expertly serves the end-to-end software risk management needs of financial firms.

Over half of financial firms feel Exactpro understand the regulatory and business challenges they face. The vendor is known for its ability to enable mission-critical assurance strategies.

Exactpro exhibits leadership for embedding effective AI into the quality process journey.

Beyond their specialist automation, API and AI testing capabilities, the firm enables several systemically important financial institutions to assure complex applications in production-like conditions.

The QA Vector® Impact Quadrant shows vendor:

- Impact scores: based on ability to accelerate the quality process journey
- Satisfaction ratings: based on overall customer experience.

Figure 8 - the QA Vector® Impact Quadrant, illustrates Exactpro Systems’ relative customer satisfaction and ability to impact time-and-quality against the market average.

"Exactpro have real subject matter expertise in an exchange context."
- Head of QA, Exchange

“We use Exactpro for all of our mission critical activities.”
- Chief Information Officer, Interdealer Broker
Information about our research methodology and respondent panel.
Appendix: methodology, QA Media and the project sponsor

Respondent demographics and research methodology

QA Media interviewed 25 economic decision makers globally at financial firms about their strategic approach to QA.

Respondent Institutions
Our respondents were drawn from a diverse set of institution types.

Custodial banks, exchanges and exchange groups, clearing houses and interdealer brokers account for 88% of institutions surveyed. The remainder are drawn from industry bodies and other financial institutions.

Respondent Seniority
Our respondents hold senior responsibility within their functional area, shown in figure 9.

Two-thirds of our respondents are either Global Head or Executive Director. Half of the remainder are C-level executives.

Respondent Geographies
Respondents to our study are based in EMEA, Asia Pacific and the Americas.

Approximately half of respondents are based in EMEA.

Respondent Functions
The primary functional areas of our respondents are DevOps, Quality and Risk; accounting for over half of the sample.

Strategic (for example CIOs and CTOs), transformation and business functions make up two-thirds of the remainder.

The balance is functionally aligned to either data, operations or engineering.

Analysts for QA Media conducted telephone-based and face-to-face interviews with senior executives at 25 financial exchanges, clearing houses, interdealer brokers and custodial banks across North America, EMEA and Asia during March and April 2019.

Respondent feedback was aggregated, and QA Vector® weightings applied to identify the issues impacting institutions’ quality journey.

Figure 9 – Approximately two-thirds of our respondents hold either Global Head or Executive Director level responsibility.
QA Media was established in 2015. Ours is the only information services platform serving senior quality decision makers in software quality assurance and risk management at financial institutions.

We produce conferences, webinars, news and research insights crafted with the specific needs of our audience in mind.

Our audience trusts us for specific information that helps them make IT investment decisions. Our research team has over 30 years’ experience of conducting research into the issues affecting technology and finance professionals.

Exactpro specializes in open access quality assurance services and related software development, with a focus on test automation for securities data distribution, trading systems, risk management, market surveillance and post-trade infrastructures.

Exactpro – founded in 2009 – is a young, agile company, operating in the UK, US and Eastern Europe. Exactpro has attracted and retained a superb technical team of talented engineers. Exactpro’s staff are technically advanced, proactive and responsive to client needs.

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