

PERSPECTIVE



Implementing QA Successfully  
For Capital Market Firms  
*- A Practitioner's Viewpoint*



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## Introduction

Striving to keep pace with new regulations, trends and breakthrough technologies, Capital Markets firms are seeking to launch inventive products leveraging technology. Doing so successfully is critical if they are to differentiate themselves and lead the marketplace. Typically, these firms face challenges related to the quick processing of high volumes of data required for trading and complying with regulatory norms. When business units in such firms

turn to technology to create or enhance their competitive edge, the expectation regarding the quality delivered from the developed products is extremely high.

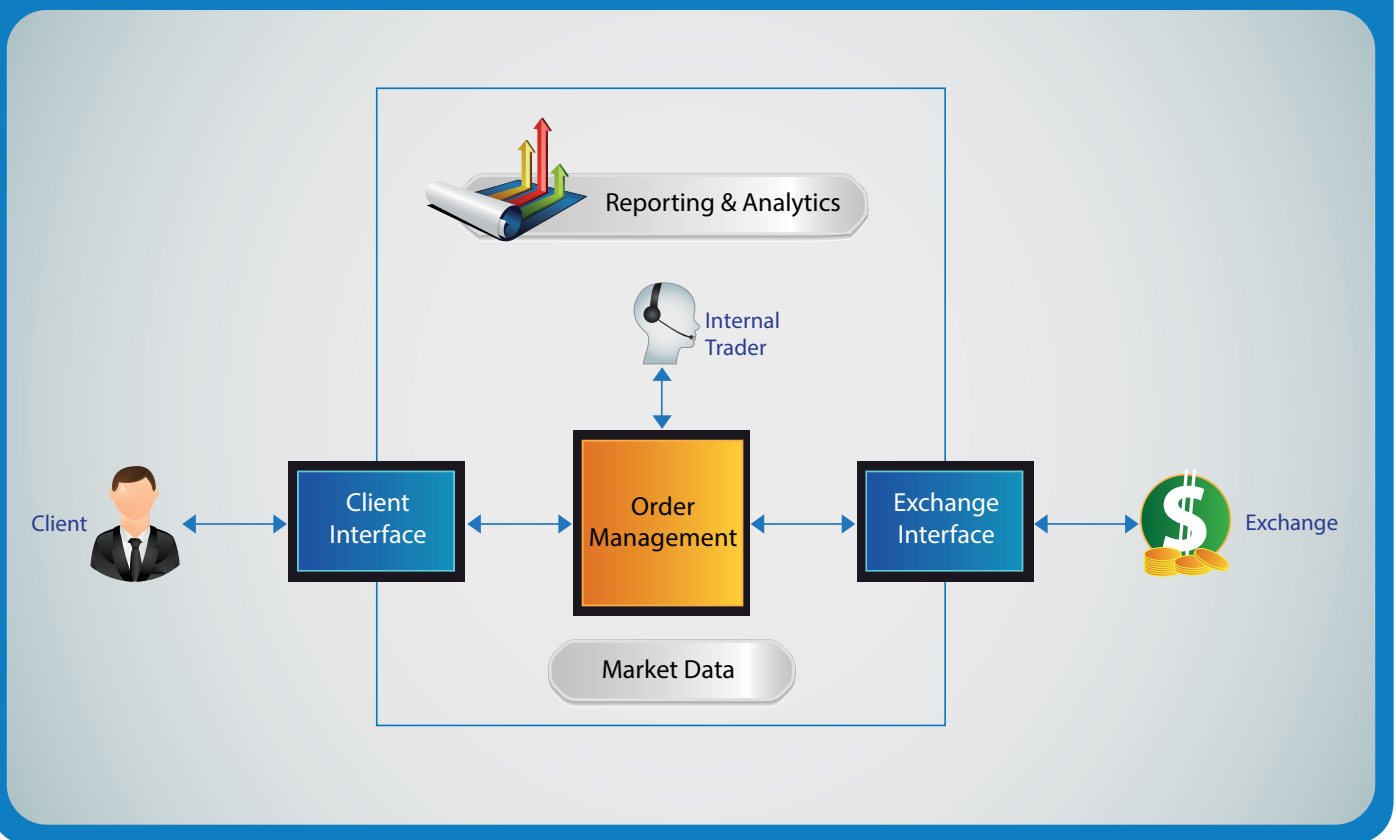
This article covers the key factors which determine the success of Quality Assurance (QA) teams in overcoming the said challenges and delivering robust trading technology platforms from the perspective of a sell-side US trading firm.

Several factors determine a Capital Market firm's success, including a robust QA infrastructure and an apt metrics tool. To ensure these, it is necessary to understand the business domain specific to the firm and decipher the non-functional testing aspects with an in-depth understanding of the business application and the firm's long-term business strategy.

### Relevant Expertise Matters – A Practitioner's Approach to a Successful QA Implementation

While several factors attribute to the delivery of superior quality systems in the sell-side trading domain, we discuss the most important ones below.

**Figure 1** offers a high-level overview of front office order management in a standard sell-side trading firm.



## 1. A Holistic QA Approach Coupled with Domain Depth

Domain expertise is critical to ensure that technology is applied appropriately in the broader business context. As the deadline for delivering a system draws closer, stakeholders often extend limited support to QA needs and requirements. Expectations from QA functional testers become similar to those from a functional analyst. As the industry's rules and regulations are well documented, functional testers are expected to churn out all the possible business scenarios for testing. However, for an elevated QA output, QA teams must work in collaboration with business analysts, application developers, and production teams. To accomplish the same, QA teams must understand and speak the trading market's language with these various



teams. However, acquiring that level of knowledge about such a demanding business environment in a short span of time is extremely difficult. This is where domain knowledge becomes an advantage. It is also important to note that functional testing and domain knowledge are not limited to what one

sees and tests in the user interface of a system. Several other aspects are relevant to a downstream process – such as trade booking and allocation, which may not be available in the user interface. Hence, the ability to have a broad understanding of such dependencies and being able to link them proves to be very useful while certifying the application for production. To summarize, a QA team equipped with good domain knowledge helps:

- (a) Implement a risk-based testing approach
- (b) Take a holistic QA approach than an isolated application-focused one
- (c) Communicate with multiple stakeholders and subject matter experts

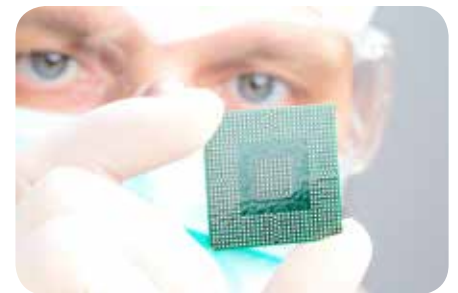
## 2. Overcoming Non-Functional Testing Woes

When dealing with non-functional testing aspects, it is crucial to understand the applications and workflows under scope in detail. For example, analysis of trading patterns pertaining to the corresponding business application is a pre-requisite for a QA practitioner looking to design the relevant test cases.

It is also important that QA teams clearly define and communicate the benchmarks under non-functional testing to all stakeholders to reach a consensus much earlier in the software development life

cycle (SDLC). The benchmarked numbers must be reported in a manner that is uniformly understood by all to avoid any misinterpretation in the production scenario when critical decisions are being taken. To demonstrate, consider a situation where a decision needs to be taken to route orders from exchange 'A' to exchange 'B'. The decision-makers must be able to look at the current load of exchange 'B' and the benchmark numbers' report, derive timely insight, and be in a position to take quick informed decisions. In a real-life

scenario, the time available to take such decisions would be minimal during trading hours, making accurate interpretation mandatory.



## 3. Superior QA Infrastructure: Take a Fresh Look

In large-scale projects, QA must cover functional and non-functional aspects (like fail over-recoverability, capacity, and latency tests), system integration tests, user acceptance testing (UAT), etc. The QA team cannot depend on one single environment to conduct all these tests sequentially, especially when it is running against time. Hence, the need arises for multiple QA environments to execute several parallel and simultaneous streams of tests.

Virtualization enables optimum utilization

of hardware resources with significant cost savings since a multitude of tests can be executed simultaneously in virtualized environments. However, due diligence must be carried out when using it for nonfunctional tests and while collaborating with application developers and production teams.

Once built, end-to-end QA environments must aim to achieve multiple benefits of higher availability and maintainability. To deliver enhanced quality, QA teams

need to ensure adherence to standards and production methodologies. It is a good practice to include morning checks (preferably automated) to initiate test commands as a prerequisite to execution. This helps validate the health of the end-to-end QA environment for testing. Moreover, using the right set of tools for monitoring, exchange simulation, etc., helps ensure the availability of end-to-end QA environments.

## 4. Using the Right Metrics

QA reports must capture the critical points with precision as senior stakeholders generally only scan through the reports. Hence, proper structuring of the report, where the crucial details are communicated at the beginning of the report, is important. Dedicate the top portion for an overall status of the project indicating whether the project will meet the deadline or is it at risk of missing the deadline? If it is at risk, ensure that the root cause is also stated at the top. For example, "Functional testing is behind schedule due

to the nonavailability of test exchanges (caused by a test infrastructure issue at XYZ exchange). In-house simulators are being explored." If the project is at risk, such pointers assist senior stakeholders in taking quick and informed decisions to overcome the roadblocks.

Apart from showcasing the efficiency and effectiveness of the Testing team, QA metrics must be mapped to illustrate the alignment of QA to the business goals. Hence, it is important to identify all



stakeholders and ensure their participation in defining the QA metrics.

## Conclusion

As competition intensifies, a serious commitment to innovation is required. As a result, Capital Market firms are on the lookout for new and creative ways to stand out in a crowded market. Independent Validation and Testing in the Capital Markets domain is relatively young. However, considering the fast pace at which the industry is progressing, technology needs to play a greater role to keep pace. Measurable business outcomes will dictate the manner in which a superior quality of systems or products is delivered.

To conclude, for the successful implementation of QA from a Capital Market firm's perspective:

- Domain and business understanding pertaining to the firm is a must; be it the ability to comprehend the trading patterns or to implement functional testing
- The 'Fit for production' stamp for the system needs to be certified from both functional and non-functional testing aspects. Over the past few years, increased focus on the latter has seen traction in the Capital Markets domain
- Capacity, performance, fail over recoverability, and latency need to be incorporated as part of the overall QA strategy
- Liberal investments in QA environments and their efficient management are required
- Teams must ensure that metrics are a key ingredient/tool for facilitating collaboration among stakeholders and ensuring the communication of key takeaways from project execution. The metrics must be comprehensible to all stakeholders

It is important to review and analyze a project post its release to assess its quality across all stages of the SDLC, share the best QA practices for future use, and work on the shortcomings.

## About the Author

Sarat Kumar

Senior Project Manager, Independent Validation & Testing Services, Infosys

With more than 14 years of work experience in IT, Sarat's expertise spans across application development and maintenance to project management to QA management for leading players in the banking and financial services domain. His current focus area is data warehouse testing.

For more information, contact [askus@infosys.com](mailto:askus@infosys.com)

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