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Improving the Test Process

Domain based testing is here!
– The next wave of QA innovations

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QA practices over the decades have seen many waves of innovation, be it test automation or techniques to optimize testing. In the early part of the decade, if one spoke of matured QA practices, it referred for the most part to standardization of processes, common metrics for measuring QA effectiveness and, probably, test automation. With changing times, the QA function as we knew it evolved and the focus shifted to:

- Requirements coverage vis-à-vis code coverage

- Meeting relevant compliance and regulatory standards

- Keeping in mind the end user perspective, while certifying the application under test

A common thread to the aforementioned aspects is the need for QA teams to have a deeper appreciation of the business domain of the application being tested. This trend is one of the most pervasive phenomena the QA industry has seen lately. The software QA industry, which had a largely horizontal focus and was indifferent to business domains, is now turning into an industry where specialization in verticals is a must.

For QA teams to be seen as true advisors to the IT leadership, their ability to understand the domain in which the customer is operating and take decisions that are in line with the customer's business priorities is critical. Be it to prioritization of requirements based on business criticality or reporting business impact of unresolved defects, the QA teams have a significant role in ensuring that IT applications help customers derive maximum business benefits from their investments in IT.

Domain specialization helps QA teams achieve multiple benefits through the Software Development Lifecycle (SDLC). The table below summarizes the potential benefits of a vertical focus in QA through the SDLC lifecycle.

Life cycle stage	Benefits of vertical specialization
Requirements analysis	• Ensure coverage from business functionality perspective • Enables early identification of defects through static testing
Test planning	• Prioritization based on business criticality
Test execution	• Risk based test execution • Accelerates test execution by leveraging vertical specific automation / point solutions
Test reporting	• Go and No-Go decision based on business criticality of the unresolved defects

Let us now consider certain situations to understand better how domain/vertical knowledge can help QA organizations ensure 100% defect free deployment and adherence to stringent schedules.

Situation 1 – OSI Compliance Testing for US Banks

OSI was introduced by US regulatory bodies to increase the option symbol length, from the earlier 5 characters to 21 characters, to manage the expected growth in options volumes, as well as to enable introduction of new products. This was a federal mandate that impacted all US Banks and Financial institutions, and the compliance date was common, thus making it non-negotiable. The Option Clearing Corporation (OCC) also published various guidelines which required the banks' and financial institutes' IT teams to have a thorough understanding of Option industry functions. Given the high stakes involved due to this mandate, extensive end-to-end regression testing for all combination of options and order types was necessary. Further, in a majority of the financial institutions and banks, changes impacted many applications in IT systems.

In such a scenario, what would the leadership of financial institutes really want from the IT organization? The answer is pretty simple. They would want the IT team to deliver specialists who understood the OCC guidelines and the impact these would have on the IT infrastructure and on the overall business itself. Domain

knowledge would not only help these specialists implement static testing, which helps in early validation, but also allow them to work as catalysts to identify the impacted systems in the client's IT and business landscape. This would help expedite the process of testing and deployment. Further, with proper domain enablement, the QA organization would be able to use ready-made options trading test case repositories and automated test libraries that could accelerate the building of the much needed end-to-end test scenarios for the proposed OSI changes. These steps would help QA teams ensure 100% coverage and faster implementation of the proposed OSI changes without losing much sleep over it.

Thus we can see how the knowledge of a particular domain, in this case OCC guidelines, would have made the process of compliance for banks and financial institutes a lot easier and smoother. More importantly, it would be a lot more hassle-free. The same applies to other industries, too.

Situation 2 - 5010 Compliance validation for large US based insurance companies

The Health Insurance Portability and Accountability Act (HIPAA) requires the adoption of X12 version 5010 (migrating from 4010/4010A standards), which is to be used by covered entities (health plans, health care clearinghouses, and certain health care providers) when they conduct certain health care administrative transactions electronically, such as claims, remittance, eligibility, claims status requests and responses. A 5010 upgrade has 968 unique changes, as compared to 4010, across all nine X12 transactions supported by clients, and this demands that testers be well-versed with all impacted areas. Further, like every other regulatory compliance, the 5010 compliance mandate comes with very strict deadlines forcing insurance companies to shorten implementation timelines significantly.

In such a scenario, to address the need for effective and accelerated testing, the insurance company needs to have -

1. A Testing solution or accelerator that can help test the data conversion from 4010 format to 5010 format. The conversion can be a very data intensive process and its testing may require that appropriate business rules and configuration be made available in advance to ensure testing proceeds with minimal customization.

2. Ready-made test repositories containing 5010 files across all 9X12 transactions. This will provide a good starting point for the creation of test scenarios and ensure optimal coverage.

3. An effective training programme to share domain specific knowledge and availability of a pool of experts to address sudden ramp-up requests by business teams looking to accelerate business compliance

So, from the above examples it is evident that an understanding of domains certainly helps QA organizations to respond to business requests more effectively and efficiently. Having said that, does understanding of business/domains help only in compliance situations, or is the impact felt in the day-to-day functioning of QA organizations too? Let's look at another situation which will help us answer this question.

Situation 3 - E-Commerce Testing Solution for retailers

In the last decade or so, the landscape of software applications within organizations has undergone a fundamental change. In fact, the retail industry has witnessed these changes more than most other industries. The democratization of software applications has relegated the single, monolithic, restricted-user applications of yesteryears to history. Today, the IT landscape in the retail industry is filled with software applications that are dynamic in nature, supporting thousands, sometimes millions, of users at any given point in time. Most importantly, IT applications in the retail industry support revenue-generating activities and are thus crucial to the company's revenues.

All these changes have made the process of testing applications a lot more complicated. Let's take a simple example of an e-commerce program aimed at integrating multiple e-commerce websites of the retailer onto a single platform. In such a case, the system faces various challenges, as it is required to:

*   support end users to complete business transactions faster irrespective of the user's physical location or the mode of accessing the e-com portal.

*   provide the user with a secure shopping environment

*   support the internationalization requirement

*   support a large diversified, distributed and differently enabled user base

Reusable pre-defined test scenarios modeled around standard e-com business processes can help ensure faster time-to-market, which is a key business imperative for any retailer. Hence it is very important for QA teams to be knowledgeable about typical security, load, usability and accessibility test scenarios which need to be tested during the implementation of e-commerce portals. Security testing especially becomes very important, even more so than the additional features an e-com portal may provide, as online shoppers are concerned about security of their personal information. Previous knowledge of typical security vulnerabilities in similar applications goes a long way in creating specific test scenarios that can help de-risk new implementations. Further, domain experts play a critical role in developing ready-made point solutions / scripts which help accelerate the test execution, thereby reducing overall implementation time and effort.

So, while it may not be too hard to appreciate the value of vertical/domain focus in QA, the challenge lies in achieving it. The simplest way to achieve this could be training all team members on the domain, but is that enough?

The key in making the vertical focus sustainable and effective is to identify ways of integrating it in the day-to-day activities of the QA team. Reusable assets comprising of test scenarios covering commonly implemented business processes for each business vertical, pre-built automated scripts for industry specific ERP packages, and test cases built from a repository of commonly encountered issues (based on end-user feedback) are good examples of how a vertical focus can be built into QA practices, thus making them both efficient and effective.

Conclusion

Verticalization of QA is already helping bridge the gap between the business users and the IT teams thus helping increase the relevance of the work product that is delivered to the end user. The vertical specialization is creating a platform for innovation that will shape the way QA practices will evolve in times to come. This focus provides a unique solution to address the triple constraint of cost, quality and time that the QA teams have always been challenged with. The QA organizations should rapidly embrace this change and focus on creating a competency development process to ensure that their teams stay abreast of the latest trends and business requirements, in order to continue delivering on the promise of certifying applications that are ready to deploy and meet the end user's requirements.

> biography

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