Perspective on QA to QE Transfromation

Saritha Basireddy

Abstract— We need to meet the high demand of delivering sustainable and high-quality products in quick time across the domains and industries. Traditional QA (Quality Assurance) methods were taking its own time and facing delays in delivery due to the defects found in much later stages in SDLC cycle. Sometimes, this may lead to redesigning the product and it results in high cost and delays in finishing the product. We can resolve these issues in real-time by transforming from reactive quality assurance approach to productive quality engineering approach.

Index Terms— Quality Assurance (QA), Quality Engineering (QE), Transformation, Agile, DevOps, CI/CD Pipeline, Continuous Testing

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1 INTRODUCTION

Traditional Quality Assurance model focusses only on finding defects. Only when any issue is repetitively occurring, developers look back into design aspects to fix the issue which leads to delays in delivery and high operating costs. On the other hand, Quality Engineering is about defect prevention and quality engineers / Testing consultants works along with development teams which helps in finding issues at much earlier stages can reduce cost and faster release cycles.

In my view, Quality Engineering combines the Process, Tools and Resources. Right Proposition of these 3 elements addresses the quality, speed and cost which are key factors in delivering high-quality products.

1: Agile and DevOps delivery model drives the QE process, so any project team needs to implement Agile and DevOps process throughout the release cycles.

2: On top of this, identifying and implementing right set of tools throughout the development cycle including requirement gathering, design & development, build automation, testing, automation and release & deployment phases plays a key role to transform QA to QE in any organization.

3: We have to align resources to process & tools and ensure that best practices being followed to implement QE collaboratively with support from BA, Dev team, build team, Testing team and Deployment team.

2 PROBLEM STATEMENT

We observe that in our organization most of the projects might be working on to transform QA to QE to meet the customer demands. But, in many cases the implementation may not be appropriate to meet the customer requirements and teams were not working in collaborative manner which results in failures while transforming to QE.

3 PROPOSED SOLUTION

Quality Engineering (QE) methodology concept is well known, so this paper addresses how to implement QE successfully in an organization / project. Our QE approach addresses the quality, speed and cost while transforming from QA to QE.

Below are the key steps in QE implementation:

1: QE Strategy: Develop a strategy around the development, operations, management, and infrastructure etc. and align the engineering tools accordingly to implement quality engineering right from the beginning of project life cycle.

2: Cultural Shift: This is the key for success of transformation from QA to QE. Entire team should be inline and willing to adopt the new process and best practices. So, encourage the team to adopt this cultural shift and monitor the progress continuously.

3: Identification & implementation of open-source tools and integration of tools: Evaluate and use open-source tools based on the technology stack which addresses the cost factor. Integration between tools (for requirements management, project management, source code management, build automation, testing and release management) helps the team in seamless collaboration while delivering a project and reduces effort.

4: Identifying appropriate environments for Automated code deployment: Right environment setup at right time with the help of deployment tools to speed up the execution process. Perform functional / non-functional testing on the appropriate environment which ensures the quality right from the beginning.

5: Exhaustive test data: Perform testing with exhaustive data to avoid identifying issues during UAT phase or postproduction.

6: Continuous integration between developers and testers in Agile way: Consistent testing approach to be aligned with sprint development cycle and with automation first concept implementation is the key. Validate the integrations within the sprint cycles to avoid the issues in final SIT phase. We understand that performing the SIT at the end of release cycle throwing more issues which is leading to delay in delivery.
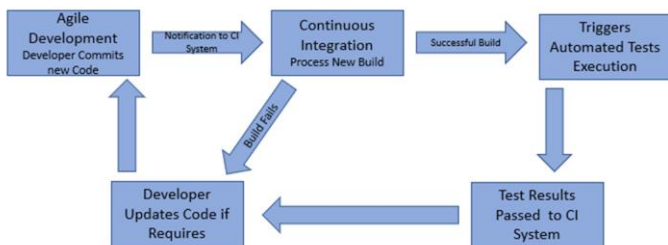

7: Shift Left and Shift Right Framework: Shift-Left ensures early test planning through engagement with Business, Design and Development teams. Shift-right ensures early engagement with operational users to seek feedback of live environment and improve test approach. With this approach, quality assured throughout the project lift cycle.
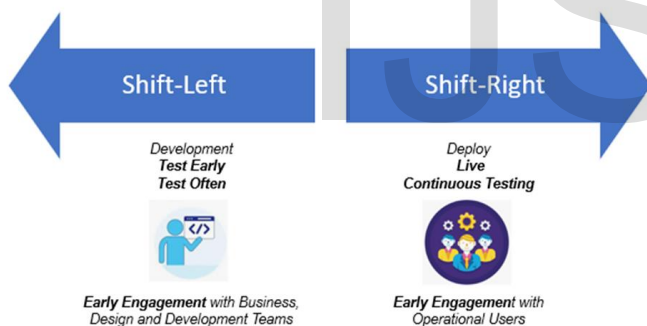
8: Building an effective CI/CD pipeline and integrate continuous testing: Maintain continuous quality while building CI/CD pipeline. This includes code commit, create build, automated testing, and deployment. Automate this complete process for faster release cycles. For example, some of the applications like Amazon and Facebook will have daily releases and this end-to-end automated process is effective in maintaining high quality.

Build a progression & regression test suite continuously during sprint cycle and integrate automated test scripts with CI/CD pipeline to completely automate the end-to-end testing process.

Automated Delivery Pipeline
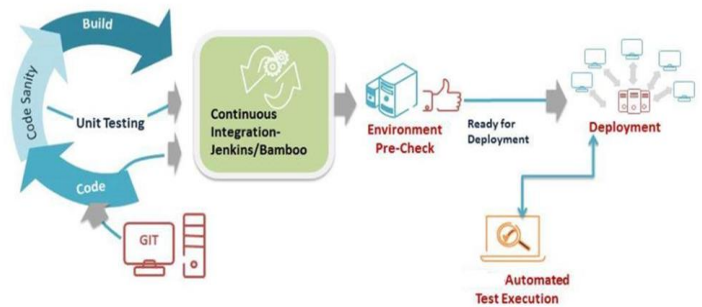
9: Non-functional testing: In the overall project timelines, non-functional testing is given less importance which affects the quality. Our implementation plan should include non-functional testing appropriately and it should be aligned with the development progress. Perform Intermittent performance and security testing during the sprint development cycle.

4 CONCLUSION

Transformation from QA to QE is gradual process that needs to be organized and implemented with right approach and strategy to meet the customer demands. Although right strategy and engineering tools in place, success of QE implementation totally depends on cultural shift in the workplace.

5 ACKNOWLEDGMENTS

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