The Quality Challenges associated with implementing Agile & Scrum

nFocus Testing

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Executive Summary

The promise of Agile and Scrum delivering working software quickly and efficiently is being compromised by the variable quality of the resulting software.

This has been caused in part by the challenges of integrating testing into the application lifecycle. Our observations of the causes of these quality issues include:

- Mismatch of expectations of what pure agile/scrum promises versus the reality of hybrid projects
- Teams being selective in adopting agile principles and scrum practices
- Poor definition of the criteria to define 'Working software' and 'done' for a sprint
- Testing professionals not engaged or influential enough, in project and sprint planning
- Testing professionals not embracing new ways of working to support the team
- Test professional's skills not matched to the requirements of working in a small empowered team
- Tools not being effectively utilised to maintain and improve quality of the software deliverable

Introduction

There have been challenges in the adoption of the agile principles and scrum framework, particularly with poor quality of the delivered software. This has resulted in delays and a mismatch of the expectations of stakeholders and delivery teams. There is no specific mention of testing or quality assurance in agile or scrum; it is implied as an integral part of the principles and framework. This has caused some confusion resulting in inconsistent approaches to quality management and testing. Often formal testing has been reduced to ad hoc 'try it and see' during a sprint. This loses the testing rigour that delivers quality by use of industry accepted full lifecycle testing.

We see agile principles being misinterpreted and sometimes abused. One of the main issues is that the word 'over' has been taken to mean 'instead of' leading to a fundamental misuse of the approach resulting in expected outcomes not being met.

There is also considerable debate on the way testing should be implemented to support the concept of 'working software'. This has meant that formal testing and quality assurance has been side-lined rather than being embraced by agile teams. We often see clients who struggle with this dilemma.

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Testing

The objectives of testing are to ensure as far as possible, that the stakeholders' customers (which may be internal end users or external customers) can carry out their transactions in a timely, consistent, secure and reliable manner. The development team achieve this by:

- reducing the risk of failure of the software to an agreed and acceptable level by debugging as appropriate
- increase the confidence of stakeholders that the quality of the product is at the agreed level (given the constraints of costs) by verifying correct operation
- deliver information on the quality level of the developed product and the process by which it has been developed to enable informed decisions and continuous improvement
- the transformation to agile and scrum from previous development methodologies (e.g. waterfall) poses some challenges across a number of areas as follows.

Culture and Organisation

The change to agile and scrum is often seen by management as a quick fix to reduce cycle time and resources. The result of this misunderstanding leads to over ambitious plans resulting in unexpected delays and missed opportunities for improvement in efficiency and effectiveness of the development process.

There is an increased risk to the quality of the software due to quality management (including testing) not being an integral part of the development process. We often see a negative impact on quality due to poor validation of business requirements and poor testing of the application under development. This problem is exacerbated by the lack of investment in automated regression testing to support the continuous change made during the sprint and in the production environments.

Getting the team to understand that they have to prioritise testing using business and technical risk is also problematic especially if there is little investment in the necessary skills. This leads to inconsistent testing and misuse of team resources.

Finally, we see deployment delays due to operations being unable to support fast or continuous product releases delivered by the scrum teams.

Test Strategy & Planning within Scrum

Testing is sometimes seen as a 'bolt on' piece of work after development of an increment of the software. This lack of integration within the team means the delivered increment has a variable, inconsistent level of quality which leads to delays due to unplanned extra testing, higher operational costs and a bad image of agile & the scrum framework.

We often see that the required level of quality and mandatory test activities (e.g. for regulatory requirements) are not being adequately discussed and agreed at project kick off leading to conflict and wasted time during the sprint.

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This means that the definition of 'done' does not have sufficient, objective completion criteria to achieve the stated quality requirements resulting in incomplete testing and inconsistent quality.

Poor test planning means that a joined up lifecycle approach to testing is not in place leading to increased risk of poor quality due to:

- poor definition of requirements
- inefficient use of resources
- inconsistent testing
- ineffective use of technology
- inability to quickly validate the status of the increment of software

Test Execution

Test professionals often come from a traditional background leading them to prepare detailed test scripts. This results in excessive time spent reworking tests due to the continual change embraced by an agile team. Testers now have to work in an agile world of context switching where overlap of test preparation and execution is the norm, this means keeping formal tests up to date is problematic.

Embracing change also means that a critical requirement is the ability to maintain quality by continually regression testing each build of the software. Automated testing, whilst challenging, is critical to successful regression testing. However, we find that teams find it difficult to define and implement test processes and procedures to support automated testing.

Finally, we often see resistance to new test techniques being adopted to support the short, sharp, timeboxed method of working.

Skills

We often see that the appreciation of required skills has been neglected due to naivety and over simplification of the development process. This is particularly noticeable in testing.

Frequently, the whole team has not been formally trained in scrum leading to conflict and poor team work especially with testing.

When there is a skilled test professional in the team, we find they have challenges in not knowing how and when to do testing in this environment due to traditional test planning conflicting with scrum. This sometimes leads to testers being side-lined.

The need for both knowledgeable business testers as well as technically skilled testers who understand automated testing is still there but it's challenging to supply all of those skills in one person in a small team.

The ability to develop and effectively communicate the 'why, what, how and who' of testing to all disciplines is a major challenge for the testing professional. We see personnel with strong non-technical and inter-personal skills tending to have higher credibility and influence over the team on quality matters.

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Finally, specific testing skills are often required that cannot be fulfilled by a small team (e.g. load and stress testing, security testing, quality assurance) this can be problematic; bringing in a short term resource for a specific task is seen as counter to the small empowered team approach.

Tools

It's accepted that tools are required to aid the management of the whole ALM process and to support testing in the agile high frequency change environment.

Although, whiteboards and 'yellow stickies' index cards etc. are quite effective we have found that it can be difficult for the team to keep track of tasks, backlog items, stories, tests and problem reports. This can be exacerbated by geographically dispersed teams. This leads to problems with traceability between backlog items, code, builds, acceptance tests and problems resulting in missed or duplicate
testing and the associated hit on quality.

We find that teams are often weak in using tools to support the build process including the automatic running of completed sets of regression tests for each iteration.

Finally, collection of information to recreate a nontrivial bug is problematic leading to some problems not being resolved.

Measurements

Scrum is a rigorous, empirical based methodology. Although, there is freedom for the team to decide how best to create the increment of software this means that the appropriate measurements must be taken to back the empirical nature of Scrum. We have found that this is challenging especially if the appropriate tools are not in place. In particular, estimation of testing velocity and effort is difficult leading to over commitment by the team and the resulting compromise on testing.

From a quality aspect, continual monitoring and display of the status of the testing (including reduction of risk) is often not done. This means that the team cannot easily adjust priorities to cope with problems in a specific area of the software or the development process.

Often empirical data to drive continual improvement is imprecise even though this is crucial input at the sprint retrospective meeting to enable the team to improve its efficiency and effectiveness.

Conclusion

Adoption of the agile scrum framework means that existing development and test practices must change. The small team based organisation poses a number of challenges that must be addressed if the benefits of agile and scrum are to be realised without compromising the quality and delivery schedule of the product being developed.

Testing is proving to be a significant challenge with many of our clients. We are finding new skills, techniques and tools are required if the product is to be delivered at the expected quality.

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Test professionals are key players during the application lifecycle performing the role of testing guru on testing disciplines and techniques. They also keep the team honest on quality matters and act as mentors for the test process.

To deliver consistent improving quality of the software, we would assert that the testing discipline has a key role to play over the complete application lifecycle from inception of the project, through development and into implementation.

How do we resolve some of these problems?

nFocus are an award winning testing consultancy that work with organisations to improve quality within agile and scrum projects. If your company is facing any of the challenges described in this article, please contact us today to discuss an agile health check/assessment.

About nFocus

- Longest established UK-owned pure play testing consultancy
- Specialist QA and testing consultancy since year 2000
- The only company to win Leading Vendor at the European Software Testing Awards on two separate occasions
- Managing a team of over 120 UK based consultants
- Vast domain experience
- We are truly independent and only deliver testing services
- Experience of working within all processes and methodologies
- Our specialty is providing the right expertise on site in the UK

Need some help?

nFocus have vast experience of supporting organisations of all sizes to improve their testing.

To discuss your specific needs, get in touch with our friendly and knowledgeable team today:

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