

## ANALYSIS OF AGILE TESTING METHODOLOGY

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**Abstract** - The field of software is constantly improving and although it plays an integral role in every aspect of our modern world, software development process still faces a lot of problems. During the development process in an organization, effective methodology plays a crucial role in order to become accomplished. The field of software development is not shy of introducing new methodologies, to constantly strive in creating new and innovative methods. However, in the last 25 years, a large number of different approaches to software development have been introduced, of which only few have survived to be used today. Software building organizations apply software development methodologies through their growing process, they design computational tools with the best requirements keeping in mind the needs of each work unit and its integration as a system. This aids in resulting a product whose quality will depend on many factors in a variable time and cost that can overcome the budget assigned to it. Agile approach is a new methodology that has been introduced recently as a new approach for developing software to increase productivity and efficacy of software development process compared to traditional methodologies. Agile testing, one of the most pivotal aspects of Agile software development, was first introduced in 2003. And since then, companies have been moving towards the 'Agile way of working' which is quite challenging indeed, especially for large companies used to working with traditional methodologies where testing is conducted only prior to final product release. In contrast, Agile methodology requires that testing be done after each iteration to detect bugs as quickly as possible. Due to this traditional companies find it hard to adapt to the more recent, different methodologies. This paper aims to illuminate the main factors which are of paramount importance in the Agile testers' perspective for the successful Agile testing implementation in an organization using Agile testing methodology.

**Key Words:** agile testing methodology, agile testing, software testing methodologies, organization, software development methodologies

### 1. INTRODUCTION

At its core, Agile Testing practices involve discovering requirements and developing solutions through the

collaborative effort of self-organizing and cross-functional teams and their end users. It enforces adaptive planning, evolutionary development, rapid product delivery and consistent improvement. And perhaps the biggest advantage of this methodology is its ability to dynamically respond to change.

The Agile Manifesto has four central themes:

- Individuals and interactions over processes and tools.
- Working software over comprehensive documentation.
- Customer collaboration over contract negotiation.
- Responding to change over following a plan.

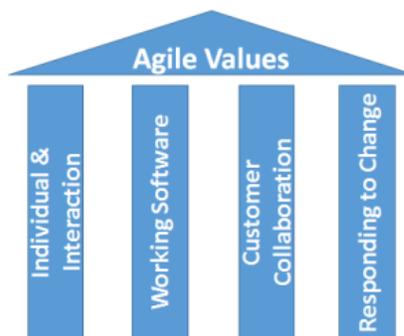


Fig -1: Agile Values

These values and the twelve principles espoused in the Agile Manifesto were derived from and underpin a broad range of software development frameworks, including and not limited to Scrum and Kanban. The twelve principles however provide a more concrete explanation of how Agile Software Development should take place.

### 2. CHARACTERIZATION

It has been a long time since the Agile Manifesto was penned and it's interesting to revisit these principles to see if they still stand true. With one of its core principles being 'responding to change over following a plan' it can be understood that Agile testing embraces change and aims to turn it to the customers' advantage. Change in basic requirements is commonly very burdensome on a tester so much so that they resent it, however; Agile testers are instructed and expected to welcome changes. Agile testers are

required to be flexible and possess the ability to respond to customers' needs and requested changes; there must be facilitation for new features to be added seamlessly or for existing features to be removed at any given time as the customer wishes.

The Highsmith and Cockburn report of 2001 reports that the constant changing environment in the field of software has a direct effect on the software development process itself. The report further adds that satisfying the customers with the end product takes precedence over pleasing the customer during project initiation. This led to developing procedures that could better handle the unavoidable situations that would arise during the software development lifecycle. Hence Agile Testing focused on:

- Hastening the production of the first delivery in order to receive quick feedback
- Inventing simple solutions so making changes would be easier
- To consistently work on the design and reduce the implementation costs
- To regularly test so defects/errors can be caught early in the process

### 3. AGILE TESTING METHODOLOGY

Agile testing which was created by Brian Marick in 2003 is a testing practice that begins at the start of a project with continuous integration between development and testing. It is a customer-facing approach to testing, meaning that products are tested more often and hence there is more focus on the final product in order for Agile testers to be able to assess and improve it in simpler fashion.

What makes Agile Software Development 'agile' is it being incremental (small software releases, of small cycles), cooperative (both the customers and developers working constantly together in close communication), straightforward (the method itself is easy to learn and to modify) and adaptive (able to make last moment changes).

The methodologies of software development life cycle follow incremental models or are iterative in nature just like waterfall model. With the simple testing, software development is most complex task, sequential models cannot efficiently adapt the changes those occurs during development. This disadvantage has been removed with the agile testing process which is based on the iterative methodologies and overcome the disadvantages of sequential models.

In the incremental method, it calls for the software being developed to be tested in its entirety at each stage which is usually executed using the automated acceptance testing. Automated acceptance testing minimizes manual labor which works out well in the case of agile testing where manual testing is not very efficient. Agile methods focus on one-to-one communication over written which makes maintaining written documents somewhat redundant. Hence Agile teams make very little written documents as compared to waterfall

or V model. Agile methods emphasize on working with the software as the primary measure of progress.

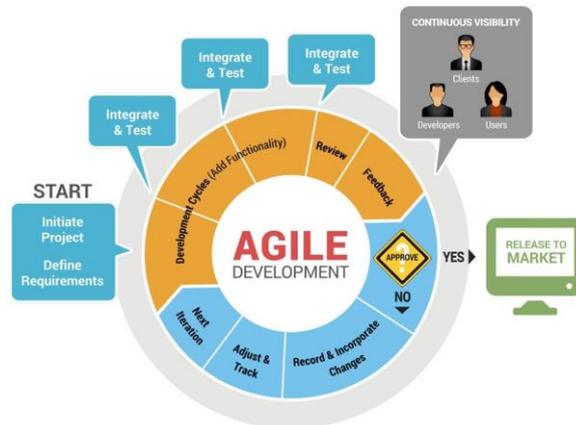


Fig -2: Agile Development Lifecycle

### 4. AGILE TESTING METHODS

Some of the Agile Testing Methods:

#### 1- Behavior Driven Development (BDD)

BDD uses human-readable descriptions of software user requirements as the basis for software tests. It was designed to improve the communication amongst the project stakeholders so that all the business partners and non-technical participants in the project could understand each feature before the development process started. Behavior-driven development combines the general techniques and principles of Test-Driven Development (TDD) with ideas from domain-driven design and object-oriented analysis and design.

#### 2- Acceptance Test Driven Development (ATDD)

Similar to BDD, ATDD also focuses on harmonious collaboration between the business partners, non-technical participants and the developers and testers. ATDD majorly encompasses writing Acceptance tests which are generally written before the developers write the code. Acceptance tests are written when the requirements for the project are analyzed thoroughly.

#### 3- Exploratory Testing

As indicative of its name, in Exploratory Testing the test cases are not written beforehand but the testers perform the tests on the fly, as they see fit. This makes Exploratory Testing more adaptable to change and encourages the testers to learn more thoroughly about the project burdening the tester with more responsibility as well as personal freedom. Exploratory testing is a simultaneous process of test design and test execution.

### 5. ADVANTAGES OF AGILE METHODOLOGY

Perhaps the biggest significant advantage of implementing Agile Methodology is the cost efficiency and fast delivery promise. Thanks to its iterative model, the customers get consistent update and feedback which makes them feel more involved in the product creation and also

keeps them updated. Another big advantage that Agile Methodology offers is that any changes or enhancements can be implemented without any budget constraint. Agile Methodology also allows the customers, project stakeholders to change their requirements during the development process and the implementing the changes will not be as hard on the developers. Agile Methodology increases the overall Quality Assurance (QA) of the project and encourages good communication between the non-technical participants and the developers and testers.

## 6. CONCLUSIONS

For software projects and customers that change their requirements frequently and expect the product to be delivered in a short period of time, Agile Testing and Development Methodology can do good. In the current scenario where everything runs and functions in a strict time bound limit implementing the Agile Methodology is a good call. In conclusion, the major aspects that Agile Testing focuses on are simplifying the project, simplicity and speed. In shorter words, the agile development and testing teams focus on delivering the product first, receiving rapid feedback and reacting to the received information.

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