

An Approach to Emphasize the Agile Process of Software Testing Over Cloud Computing Environment

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Abstract— The world of software engineering demands the higher customer satisfaction with simple understanding of the application and highest quality product. The software development business process place a vital role for the efficient fulfilment of the highly customer needs based on their expectations. The areas of software debugging, testing, and verification in the field of testing becomes an important process in software development not only in terms of revelation rather than providing a more safer business process. Software testing is an essential activity to software quality assurance. Under this approach, agile methodologies gives a new provision in the field of software engineering which encompass with the cloud computing environment by the latest demand by the users.

Key words: Software Testing, Agile Methodologies, Cloud Computing, Cloud Testing

I. INTRODUCTION

The word testing specifies 'to test' which is common in the world in order to find out the error and perform the correction of the error. The word testing in the field of software industry terms as the verification of the application in the process identification of errors. Software Testing is the field of software industries which determine the correctness, completeness, security and quality of the application with the intention of identifying bugs from it. This process is subjected to the removal of errors from the executable/non-executable files or any other software application whether it is web or stands alone. This technique invents the utilization of computer system for the purpose of statistical improvement in the deliverable application to the user. It determines the technique which is to be followed during error identification, fault type and its effectiveness in the application. This paper focus on the effect and influence of software testing in the agile methodology over cloud computing environment.

A. Agile Testing:

Traditionally the organizations were bound to adopt the various models includes Waterfall model, spiral model, incremental model, win-win model, RAD model, prototyping model. But in the modern scenario the agile have given new method to implement the business process. As Waterfall model provides the development team limited opportunity to get each aspect of the project right, but agile model ensures repetitive improvements at every stage of project development. Principally, agile development methodology assesses the direction of the project throughout the development life cycle which is achieved using sprints or iterations or incremental development. Each iteration consists of lifecycle of 15/30 days.

II. WHAT IS AGILE METHODOLOGIES?

A. Agile Model:

Agile methodologies are a substitute to waterfall or incremental model. It helps teams respond to unpredictability through progressive, repetitive work. It consists of a team of developers and testers who are working in parallel with the regular interaction with the client for the regular enhancement in the project whenever required. The requirements and solution to the requirements are evolving throughout the project in the iterative cycles of sprints. It is a self organizing and self governing activities which gives a proper development, testing and delivery with flexible response to the change. It is a conceptual framework that promotes continuous interactions throughout the development cycle.

B. Scrum Framework:

Scrum is a repetitive and progressive agile software development framework with a centre on supple & holistic product development strategy. Scrum is a subset of Agile where the development team works as a unit concentrates on managing every task of the sprints. An Agile Scrum process is distinguished from other agile processes by specific concepts and practices. Agile software development process is a method of developing the software product with the continuous interaction between the project team and end user. By the customer point of view, the main advantage of using agile scrum process is that, they can change their requirement in any sprints which is not possible in waterfall model. It has a product owner who represents the team and scrum in front of the stakeholders. He formulates software requirements, typically called user stories and prioritizes them, and adds them to the Product backlog. He is the whole responsible person of handling the agile software system.

C. Sprint:

A Sprint is the basic unit of development in Scrum. The sprint is a time-boxed effort, i.e. it is restricted to a specific duration ranging from one week to one month. Each sprint is preceded by a planning meeting, where the tasks for the sprint

III. CHALLENGES OF AGILE METHODOLOGIES

In modern era, agile model has now been adopted by many organizations. But an agile methodology also faces many challenges:

- 1) Increased cost
- 2) Infrastructure
- 3) Network accessibility
- 4) Platform availability
- 5) Project development & testing environments
- 6) Cloud computing

Cloud computing as a business model has been accepted for its various benefits and limitations. Cloud computing is delivery of service to the clients given by the

internet. These services can be in terms of resource, platform, infrastructure, software, information, testing support etc. Cloud computing changes the way of computation and services to end-user which received significant attention in the concept of updating of resources without affecting the underlying infrastructure. Computers in the cloud are configured to work together and the various applications use the collective computing power as if they are running on a single system. Cloud Environment offers computation, software applications, data access, data management and storage resources without requiring users to know about resource location and other details of computing infrastructure. Cloud computing is a recent evolution of distributed computing paradigm that uses the internet and central remote servers to maintain data and applications and thereby allows the users to access technology-enabled services from the Internet without knowledge of, expertise with, or control over the technology infrastructure that supports them.

A cloud computing model for software testing is developed. Cloud-based testing has the potential to offer a compelling combination of lower costs, on-demand flexibility, and freedom from holding assets, enhanced collaboration, and greater levels of efficiency and, most importantly, reduced time-to-market for key business applications. Testing in the cloud leverages the cloud computing infrastructure, reducing the unit cost of computing, while increasing testing effectiveness.

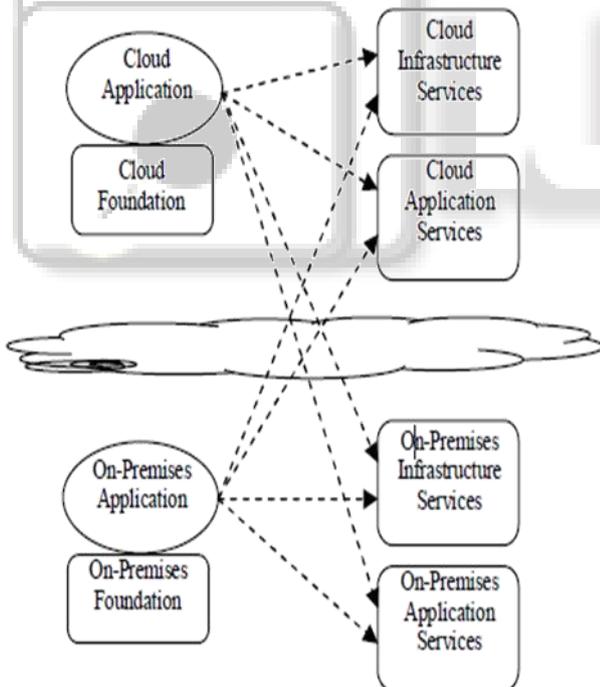


Fig. 1: Cloud Environment (Vengattaraman T., Dhavachelvan P., Baskaran R., IJCSIS, 2010)

IV. OBJECTIVE OF CLOUD COMPUTING

It has three objectives that is listed below:

- 1) To ensure the quality of cloud-based applications that is deployed in a cloud, such as their system performance and scalability, functional services, business processes.
- 2) To validate and verify software as a service and non-software as a service in a cloud environment, such as software performance, security, functionality,

reusability, scalability, and measurement based on pre-defined SLAs.

- 3) To test cloud such as cloud compatibility and communication between SaaS and applications in a cloud infrastructure.

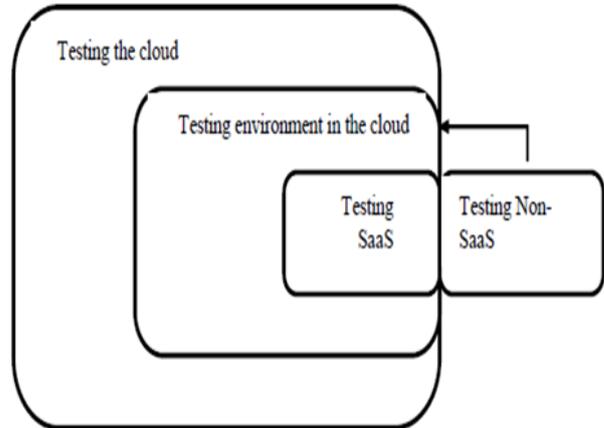


Fig. 2: Objective of Cloud Computing (Mohsenzadeh A., IJCEM, 2013)

V. CHALLENGES IN CLOUD TESTING

Although the cloud testing provides a solution to the waterfall model. There are some challenges associated with it. They are:

- 1) Security – As it deals with the public cloud so security is the major concerns.
- 2) Infrastructure – Some cloud providers offer only limited types of configurations, technology, servers and storage.
- 3) Usage: Improper usage of cloud-based test environments can increase costs.

VI. CONCLUSION

This paper elucidates the effectiveness of agile methodology in software testing over waterfall model on cloud computing environment. Different resource and other characteristics are examined to shown which factors contribute to decision to migrate to cloud computing solution. The agile software development methods enable gaining superior quality of software and make easier frequent changes to software requirements. For future aspects it can be implemented in other agile environments and analyze the comparative implementation works.

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