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Agile Methodology Utilizing Cloud Computing

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Abstract- *Because of the fact that requirement in a business environment changes constantly, agile methodologies play a vital role in software development. The agile developmental methodologies were lacking a platform for supporting brisk development. The concept of cloud computing provides a support to improve the agile development in various aspects. This paper provides a link between agile methods and how cloud computing can aggravate the development phases.*

Keywords- Agile Methodologies, Cloud Computing, Software Development, Cloud services, Cloud deployment.

I. INTRODUCTION

Agile software developmental teams and the emerging concepts of cloud computing are being utilized by software developmental companies to enhance the pace with which softwares are being produced. Agile development teams combine multiple phases of development with other cloud services through virtualization and cloud computing concepts [1].

In software development, agile methodology is an approach usually used for the efficient management of project. Through iterative and incremental work cadences, known as sprints, the agile methodology helps teams to respond to the unpredictability of building software. The answer to the drawbacks of traditional methods is the light weight software scheme, the agile methodology, and it aims to accept the changes in business ambiance which is tempestuous in nature and that demands a software to meet its needs quickly [2]. Throughout the lifecycle of development, the agile development methodology tries to give various chances to assess the direction of a project. Most of the knowledgeable people who have realized the various problems associated with the   traditional software management process are using agile methodology in the development of softwres [3]. Different kinds of agile methodologies are adopted by many organizations all over the word to get benefitted from them.

II. CLOUD COMPUTING

It is a model which enables on- demand and convenient network access to a reservoir of shared and configurable computing resources that are rapidly provisioned with minimal management effort or service provider interaction [4]. Cloud computing is entirely based on web. Cloud basically is a network of computers acting as a "service-oriented" architecture to redeem data and software. Cloud Computing has following advantages:

- Upfront infrastructure cost is avoided.
- Maximizes the affect of sharing resources
- It enables the enterprises to run applications faster.
- Higher economies of scale is achieved.
- A centralized storage mechanism is provided.

1) **Classification of cloud services:** The services of cloud computing are divided into following categories:
   a) **Software as a Service (SaaS) –** In this service, access to application software and databases are provided to the users. This includes the software which is offered by a third party provider, usually through a Web browser, available on demand, operating remotely. The providers of cloud services control the platforms and infrastructure because of which the application runs. This service is pay-as-per-use basis [5]. Examples of SaaS are Salesforce, Google Apps, MS office 365.

   b) Platform as a Service (PaaS) – The providers of cloud here provides a platform of computing, which usually includes programming language, database, execution environment and operating system [5]. This service permits the customers to built new applications using API's which are operated and implemented remotely. Some common examples of this service are Google App Engine, Windows Azure cloud Services etc.

   c) Infrastructure as a Service (IaaS) - Here the cloud providers provide resources such as Virtual-machine, file-base and raw storage, load balancers, IP addresses, firewalls, VLANs, and other abstracted hardware and operating system. Common examples include: HP Cloud, Amazon EC2.

2) **Models of cloud deployment:**
   a)Private cloud: The cloud infrastructure is solely meant for a single organization e.g. business units. An organization or a third party or a merger of the two manages, operates and owns it.

   b) Public Cloud: The infrastructure is owned by a cloud service selling organization. The infrastructure is available to the general public or large industry group.

   c) Community cloud: The cloud infrastructure is solely meant for a particular community which includes those costumers from different organization that have common concerns. Community cloud can be managed, owned and operated by one or more organizations in a community or a third party or any combination of them. Community cloud may exist on or off premises.

   d) Hybrid cloud: Infrastructure is made of two or more clouds (private, community or public) which are bound together by standardized or proprietary technology that enables portability of data and application.

III.   AGILE DEVELOPMENT

The concept of agile software development started in nineties and has changed the way by which software is being developed by concentrating on small cycles of development based on the feedback of customer on timely basis. It allows the change in increments over time through collaboration. Agile software development is a methodology which is based in incremental and iterative development. In agile methodology, the developmental phases are constantly checked by the actual users. This framework involves the interaction between cross –functional and self-organizing teams. In order to improve the pace of developmental operations, industries are highly using agile software development teams and cloud computing.

Agile methodology should be used when:

- Main focus is laid on quick production of the product and the quality of the product does not matter.
- There is no certain idea about how the end product should look like.
- There are skilled, adaptable and efficient workforce (developers), capable of thinking independently.

Ideology behind choosing agile methodology:

- In this methodology, the client is considered a the part of the project's team, so it becomes easy to recognize the best and the most cost effective way to accommodate needs of the client by working together.
- Because of the agile methodology's quick end results and frequent releases of work-in-progress, it is ensured that the project's actual needs are monitored from time to time.
- It provides the platform to develop the best possible softwares for the clients to meet their expectation, even those that were unambiguous during the beginning of the project [6].

IV. COMBINING THE AGILE METHODOLOGY AND CLOUD COMPUTING
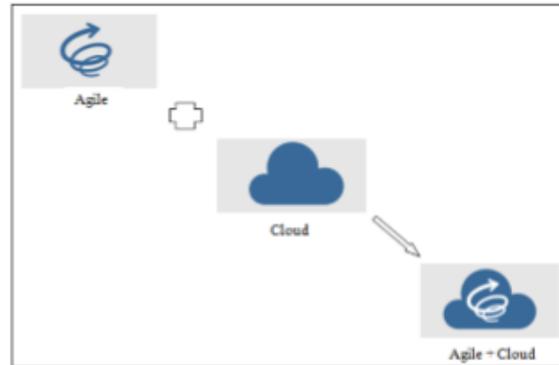

Fig. 1. The combination of agile and cloud

Cloud computing and agile methodology are best suited for each other i.e., the perfect ambiance for the agile development is the cloud computing. It lets you get valuable functionality to your customers quickly, collect instantaneous feedback, and make quick changes based on that feedback. This rapid development cycle, an inherent benefit of cloud computing, are impossible to implement in the conventional development model because of the huge cost of distribution.

The feedback of the customer is considered of great importance. It is included at every stage of the development. As a result, the team doesn't support the years of legacy releases but supports only the present production release and next release. This implies that thousands of people check into the same code base on each day. Everyone instantaneously knows about the change when someone makes it that may break existing code, so no time is wasted in the integration and merging process later in the cycle.

Advantages of cloud computing with agile development:

a) The cost of moving information between people is minimized.
b) Higher stability of work-loads.
c) Quality of the product is increased because of the earlier feedback from the customer.
d) Great flexibility to the change of development and management plans.
e) Documents are replaced by whiteboards and talking in person.
f) Time is reduced between making a decision and experiencing the consequences of that very decision.
g) Large-scale software systems are produced with a fixed number of developers.
h) It enhances the sense of unity and morale so that people are more inclined to relay valuable information quickly.

V. CONCLUSION

Agile methods are light weight software methods. Agile development methods are very realistic in understanding the fact that the requirement in a business environment changes constantly. Most of the knowledgeable people who have realized the various problems associated with the traditional software management process are using agile methodology in the development of softwares. Different kinds of agile methodologies are adopted by many organizations all over the word to get benefitted from them.

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