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Models and Characteristics in Agile processes

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ABSTRACT

As we know that till now software development life cycle is the best way that gives assurance of the quality in the project. But as agile comes in to picture, the productivity of the product may increase to the large extent. SDLC and agile both are different in many ways. This paper deals with the comparative study of agile processes and benefits over the different model used in SDLC. The paper will serve as guide to other software development process models. Agile processes have important applications in the areas of software project management, software schedule management, etc. In particular the aim of agile processes is to satisfy the customer, faster development times with lower defects rate.

Keywords: — Agile Development, Software Development Life Cycle (SDLC).

I. INTRODUCTION

In software development life cycle, there are two main considerations, one is to emphasize on process and the other is the quality of the software and process itself. Agile software processes is an iterative and incremental based development, where requirements are changeable according to customer needs. It helps in adaptive planning , iterative development and time boxing. It is a theoretical framework that promotes foreseen interactions throughout the development cycle. There are several SDLC models like spiral, waterfall, RAD which has their own advantages. SDLC is a framework that describes the activities performed at each stage of a software development life cycle[1]. The software development activities such as planning, analysis, design, coding, testing and maintenance which need to be performed according to the demand of the customer. It depends on the various applications to choose the specific model. In this paper, however, we will study the agile processes and its methodologies. Agile process is itself a software development process[2]. Agile process is an iterative approach in which customer satisfaction is at highest priority as the customer has direct involvement in evaluating the software[3].

The agile process follows the software development life cycle which includes requirements gathering, analysis, design, coding, testing and delivers partially implemented software and waits for the customer feedback. In the whole process, customer satisfaction is at highest priority with faster development time.

II. MODELS OF THE AGILE PROCESS

There are various models available for agile process which helps in the development of the software. The use of agile models increases the productivity of the software.

1. Scrum

Scrum is the framework in which you can apply to various processes and techniques within which complex products can be developed [4]. Scrum is simple. It can be easily understood and implemented. The key principle of the scrum is that whenever customer wants to change their requirement they can change the same. This cannot be possible with the use of traditional model. Instead of understands the full problem, scrum model forces or focuses upon the team ability to deliver quickly with promising requirements.

2. Extreme Programming

Extreme Programming (XP) is an agile software development methodology focused on a set of values, principles, and practices that its founders believe results in higher quality software and a higher quality of life for the development team. XP is the most prescriptive of the agile methods when it comes to appropriate engineering practices for software development. The key belief of teams practicing XP is that if a team follows a specific minimal set of engineering practices extremely well . Extreme programming starts with collecting user requirements. Depending upon these requirements the whole development process is divided into several small no of cycles. So the next phase is iteration planning i.e. deciding the no of cycles, prioritizing the

requirements and estimating the amount of effort required to implement each cycle. Now each iteration is developed using pair programming. During the development phase new user requirements may come and the iteration plan should be adjusted according to that. Next step is to test the latest developed version for bugs, if detected; the bugs will be removed in the next iteration. After every acceptance testing project tracing should be done in which feedback is taken from the project that how much job has already been done. XP has introduced many new things for developers like pair programming, extensive code review, code refactoring and open workspace .

3. Feature Driven Development (FDD)

FDD is one of the agile development methods. The key advantage of this method is to design the domain of the software to be produced before development. The method starts with collecting the requirements from the users and building up the overall model of the project. The model gives the clear idea about the scope of the software. Next step is to make a list of features which are the client-valued functions . For example 'authenticate the password', 'calculate the salary for each employee', 'calculate the income tax for each employee'. Now several groups of features are made based on their domains i.e. related features are combined into a single group. Next step is to make a plan for developing the features. Each group of features is assigned to a development team which is headed by one chief programmer. Last step is modeling iteration in which first UML modeling is done for each feature and then developing that particular feature. This step continues unless all the features get implemented successfully.

III. CHARACTERISTICS OF AGILE PROCESSES

All Agile process requires less planning and it divides the tasks into small increments. Agile process is meant for short term projects with an effort of team work that follows the software development life cycle. Software development life cycle includes the following phases

1. Requirements gathering
2. Analysis
3. Design
4. Coding
5. Testing
6. Maintenance.

The involvement of software team management with customers reduces the risks associated with the software. This agile process is an iterative process in which changes can be made according to the customer satisfaction. In agile process new features can be added easily by using multiple iterations.

A. Iterative

The main objective of agile software processes is satisfaction of customers, so it focuses on single requirement with multiple iterations.

B. Time Boxing

As agile process is iterative in nature, it requires the time limits on each module with respective cycle.

C. Modularity

Agile process decomposes the complete system into manageable pieces called modules. Modularity plays a major role in software development processes.

D. Adaptive

Due to the iterative nature of agile process new risks may occurs. The adaptive characteristic of agile process allows adapting the processes to attack the new risks and allows changes in the real time requirements.

E. Parsimony

In agile processes parsimony is required to mitigate risks and achieve the goals by minimal number of modules.

F. Convergent

All the risks associated with each increment are convergent in agile process by using iterative and incremental approach.

G. Collabrative

As agile process is modular in nature, it needs a good communication among software development team. Different modules need to be integrated at the end of the software development process.

H. People Oriented

In the agile processes customer satisfaction is the first priority over the technology and process. A good software development team increases the performance and productivity of the software.

I. Incremental

As the agile process is iterative in nature, it requires the system to be developed in increments, each increment is independent of others, and at last all increments are integrated into complete system.

IV. CONCLUSIONS

In this paper we have discussed the software development life cycle models, the characteristics of agile processes . Agile software development with other software development models we conclude that agile project is much better than other software development process in terms of productivity,

performance, faster time cycles, risk analysis. Agile processes are implemented in important applications such as web based, testing tools, etc. We can use agile processes whenever we need to perform certain changes to be implemented. Agile gives better way to improve the productivity and the quality.

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