



OVERVIEW OF AGILE PRACTICES

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Abstract

This paper presents the overview of agile practices used in various industries. The motive of manifesto for agile software development is to produce better software in a better way. Agile software development more focused on rapid responses to change and continuous improvement.

I. Introduction

A software process is defined as a set of methods and activities that helps to the production of a software product. The problem of how software development should be organized in order to deliver faster, better, and with cheaper solutions. Many of the suggestions for improvement have come from experienced developers who gave their methods as agile software development. Though there are many agile methods, but there is limited knowledge about how these methods are carried out in practice and what their effects are. The importance of agile methods has been the most noticeable change to any software development.

A. Agile

Agile is form of software development methodology. Its main aim is client satisfaction through the continuous delivery and the focus of Agile is more on limiting at the project scope. An agile project sets a minimum number of functional requirements and then into a deliverable product. Agile development methodology provides the opportunities to follow the direction of a project throughout the development lifecycle. The main Agile methodology is described as 'iterative' and 'incremental'.

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B. Need of Agile

In Software Engineering Software development is expanding day by day. Software has merged into many different fields and becoming more complex. Changing requirements from customers is making it even more difficult. The software developments which are old are not able to satisfy the new requirements of the market in the best way. Therefore as a result, new software development approaches are evolved as **agile methodologies** mainly to solve such problem. The new agile methodologies include some modifications to software development processes to make them more productive and flexible.

C. Features of Agile

Modularity in Agile

Modularity is main one of the feature element of good process. It allows a whole process into to broken into small components called **activities**. A software development process describes a set of activities that are capable of transforming the vision of the software system into reality.

Iterative in nature

Agile software processes states that we get things wrong before we get them right. Therefore they focus on number of short cycles. Within each cycle a certain set of activities are completed. These cycles will be started and completed in a matter of weeks. A single cycle called **iteration** and it will probably not be enough to get the element 100% correct. Therefore, number of short cycle is repeated many times to refine the deliverable product.

Useful time management

Iterations become the right decisions for the elements for planning the software development project. We can set time limits between one and six weeks on each iteration and schedule them accordingly. Therefore we will not schedule all of the activities of our process in a single iteration and we will only attempt those activities necessary to achieve the goals set out at the beginning of the iteration. From this, Functionality may be reduced or activities may be rescheduled if they cannot be completed within the allotted time period.

Adaptive nature

Agile methods allow change and try to adapt the change according to customers' requirements.

Incremental process

An agile process does not try to build the whole system at once. It divides the system into increments which may be developed in parallel at different times. We test each increment independently. When an increment is completed and tested properly it is integrated into the system.

II. Review of Literature

In this section we would be looking at various research papers read. Each paper proposes a different theory and set of methods of agile practices.

Malik Hneif [1] lists out the various agile methodologies which are commonly used and describe the key points of customer requirements that to satisfy the customer needs what are the methodologies have to apply while developing a software product. The methodologies which are described in this paper are extreme programming, agile modeling, scrum, feature driven development, crystal methodology and adaptive software development. By using this author concluded that agile software product will be effective and it will give optimum results at the customer side and fulfill the need of customers.

Pavithra Mani [2] describes that the evolution of agile development has changed the method of software development. To give supporting platform to these agile software development strategies, cloud computing provides necessary accelerations to this development area for enhancement. Further author described about the basic of cloud computing and agile methodology that how agile software development works on cloud platform. With the help of cloud computing, it makes it available to users immediately by installing the new distributions on hosted servers.

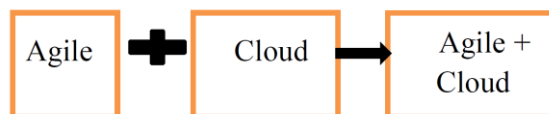


Figure 1. Agile+ Cloud Combination [7].

Cloud computing is a model that allows efficient on-demand network access to pool of shared resources that are rapidly accessible with minimum management effort. It is purely based upon internet.

Author list out the some advantages of cloud computing which are:

- It maximizes the effect of sharing resources.
- It allows organizations to run applications faster.
- Cloud computing provides a centralized storage of mechanism.

According to author a cloud environment consist of number of services and models which divides into categories. There are three services in cloud computing which are:

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS) and

There are four models in cloud computing which are described in paper:

- Public Cloud
- Private Cloud
- Community Cloud and Hybrid Cloud.

Related to cloud with agile, agile is a software development method based on iterative and incremental development. Agile framework provides the environment which involves interaction between self-organizing teams and cross-functional teams. Cloud computing and virtualization make agile development teams to multiple phases of development with other cloud services. Further author describes about agile and cloud combination that how these two when combined together, rapidly work is done. Following points explains about this combination.

- Cloud and agile is a parallel activity.
- Cloud encourages innovations and experimentation.
- Cloud enhances iterative development through continuous integration.
- Cloud provides servers for the development.
- Cloud computing facilitates code branching.

- Cloud provides delivery platforms for agile development.

Then author concluded that with the help of cloud, delay in provisioning the components which will require for agile product will reduce and this combination provides better chances for innovative development with standard business objectives.

Robert Krawatzek [3] described the Business Intelligence systems (BI) which are able to react unexpected or unstable requirements in a given time framework. The variation capability of Business Intelligence systems is usually stated as 'BI agility'. According to paper the usage of agile process models such as scrum or extreme programming are important parameters for developing BI systems in an agile. These agile techniques or agile models are used to improve the time and flexibility in development process of BI systems. Author further explained the agile Business Intelligence (BI) actions and agile catalog. It also gave some steps of its actions for development. The agile catalog comprises of 21 agile BI actions catalog and organized into four categories:

- Principles
- Process models
- Techniques and Technologies

At last, paper concluded that these agile catalogs can be used by scientific community and practitioners to find the research areas and explained fully implementation of each items of catalog.

Abdel-Kadir and Abdel-Hamid [4] explained about software process increments through agile approach. Process increments are an iterative and incremental method to manage software process improvement projects. The approach forms from agile values and principles and reuses some familiar agile techniques in managing transition risks. With the help of agile estimating and planning techniques, it divides the scope into user story like increments and manages the whole project. This agile approach has been useful to five enterprises and showed continuous improvement rate, good project visibility and on-going learning experiences by project teams.

Process increment is independent of any process increment. It has following attributes:

- Summary title

- Verification points
- Size estimate
- Process area

Process increments and dependencies are very useful in planning the software project improvement (SPI). Many agile techniques have been active while implementing the package. The following agile practices are used:

- **Process Cards:** All process increments are published on process cards and on the back, size estimation of each process and verification points are printed.

- **Product Backlog:** There are two main backlogs used in software project improvement project: the project backlog and the iteration backlog.

The project Backlog contains all the process increments and expands and shrinks according to the need of organization and **the iteration backlog** contains the increments and responsibilities to be completed during the iteration.

- **Iteration lifecycle:** The major organization changes managed against risks through this iteration life cycle technique. Classic improvement iteration describe in following figure. The following figure shows **iteration life cycle** activities.

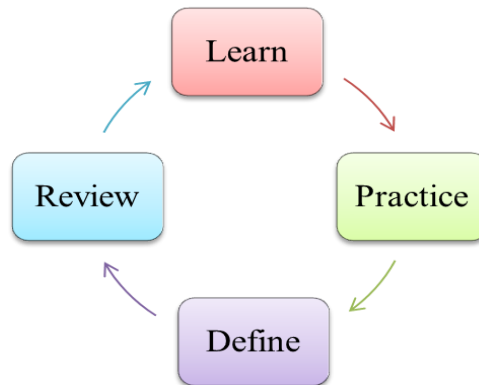


Figure 2. Two-Week Iteration in the Improved Project [4].

Author explained these four activities in detail.

- **Learn** new thoughts. These thoughts or concepts might be new process increments and it is time boxed to one day only.

- **Practice** this new idea and apply it to quick projects. Through this number of tools, concepts and actions has used to make the practice better.

- **Define** what is described in rules and guidelines or process documentation. The main motive of this activity is to record what the team members has learned and practiced.

- The excellent measure of these process guidelines is high level guideline, in which it explains the team is implementing what they agreed to be good practices.

- **Review** describes what has been proficient with the adviser and evaluate whether the process increment is complete or not.

At last, author concluded that process increment is the excellent measure to minimize the probability of failure. The sample of enterprise companies showed sustainable improvement although these organizations are of different background, business areas and technologies. Author also told about future work, that other experiments will implemented to conduct CMMI based process improvement.

Dave Bishop [5] presented the exploratory research that examines factors contributing for the development of software. The initial consideration revolves around the five factor model of personality and statement that these personality factors provide a partial explanation of predilection for an agile approach. The results from the numerical data collected from the survey study, indicates that three out of five personality factors show correlation with average preference for agile methods. These factors are extraversion, openness and neuroticism. Extraversion and openness have a positive relationship with agile preferences while neuroticism or emotion instability has a negative relationship. These factors identified through exploratory factor analysis.

Author gave real time implementation of agile principles and agile methodologies. One of the methodologies Extreme programming (XP) is that programmers work in team or pairs to solve the problems while developing the software. To measure their personality, Meyers-Briggs Type Indicators

(MBTI) finds the relationship between personality types of programmers participating in pair programming. The five factor model uses the following characters:

- Openness(O)
- Conscientiousness(C)
- Extraversion(E)
- Agreeableness(A)
- Neuroticism(N)

Author further explained about extraversion activities that it can be compared with introversion because extraversion is the measure of individual's energy and enthusiasm to involve with the people but introversion is opposite to the extraversion.

Extraversion composed of following elements:

- Confidence
- Activity
- Positive emotions

Based on these elements, more scores in extraversion more the person social able. Author collected the survey response and measures personality elements of individual's through hypotheses testing and exploratory factor analysis. At last, paper concluded that out of these five elements of five factor model of personality three of the five traits has significant correlation between them.

John F. Tripp [6] describe about the agile motives and agile practices. According to this paper research based on survey data that was collected and according to result they found three agile motives which are:

- Increase the efficiency
- Increase quality and
- Increase the software quality.

These agile motives for agile adoption are associated with different configuration of project management which is also focused on agile practices of software development. Further this paper describes that in an organization

minimum 20% projects used at least two agile practices for development. But these agile practitioners are choose and understand that which agile practices will be best, effective for implementation and what are the impact on project.

Department	Frequency	%age
Software Development	1379	59.9
IT/Support	606	26.3
Services	95	4.1
Sales/Marketing	48	2.1
Other/Missing	176	7.6

III. Conclusion

Software process development has become one of the world's most important technologies. The software produce today is growing rapidly and becoming the quality of world. Our modern world mostly depends on software. In support of efforts over the past 40 to 50 years, developers implemented various software development technologies like use to structure with the help of process frameworks, manage, and control our work. Software requirements are the basic need for development area to produce a customer's deliverable product. But the applications we developed became larger and larger still and the methods we used to control our work became heavier and heavier. So in the past two decades the movement to more 'agile' and 'leaner' software development methodologies including lighter weight but still safe and effective treatment of application requirements has been one of the most significant factors affecting the industry.

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