

# Comparative Study on Software Development Methods: Agile vs Scrum

Ankita Sharma  
JIMS Rohini Sec 5  
India

Manav Bali  
DION Global Solution Ltd  
India

## Abstract:

**N**ow a days most of the software companies are able to produce valuable software in a very short span of time with minimum costs and with adjustable environments. For this purpose Agile Methodologies were thus introduced to meet all the requirements of a software development company. In this paper we will discuss the agile technique and SCRUM there advantages and disadvantages. Also we discuss about the dissimilarities and similarities between the new requirements of the software development companies.

**Keywords:** Agile, Scrum, Extreme Programming, Kanban, XP

## I. INTRODUCTION

What is Agile?

Software development based on Agile is an incremental and iterative approach. In Agile methodologies planning is done at the initial stage and the changes made are accepted throughout the project and also a constant feedback is provided by the users [1].

The agile team involved in this methodology work on iterations of each product over a particular span of time and further the work is organized into a backlog which gives open acceptance to customer feedback. The final aim of every iteration is to produce a working product. In Agile methodologies, teamwork, face to leadership encourages teamwork, accountability, and face-to-face communication.

All the stakeholders and developers surely work towards the aligning the product taking into consideration the customer's needs and the final goals. The plan based driven methods work at its best when the developers are able to identify the requirements beforehand and also when the requirements remain very stable i.e. the rate of change is about one percent per month [9].

## II. PRINCIPLES OF AGILE METHODOLOGY

The Agile Methodology follows certain principles for guidance to the teams on how to execute agility.

These are the principles [8]:

1. The very first priority is to get the customer satisfied through early and constant delivery of the software.
2. The Agile processes is open to acceptance to customer's feedback in the late development phases also.
3. The delivery of the working software should be within a few weeks to few months giving major preference to the timescale.
4. The developers and the people involved in the whole team must work together on daily basis throughout the project.
5. Projects constructed with motivated individuals. They are provided with right kind of an environment and support they require and also trust is built on them to get the work done.
6. Agile methodology also follows the method of conversation that is done face to face so that complete and effective information is passed on.

### Advantages of Agile

Agile methodology has been eventually developed from various lightweight software approaches and has also become the major reason for dislike to the classical Waterfall development process [3].

Here are some of the Pros of Agile:

- Change is accepted
  - End-goal can be unknown
  - Quick and high-quality delivery
  - Strong team interaction
  - Customers feedback taken
  - Continuous improvement
- Cons of Agile The flexibility level in agile is usually very positive but still it comes with some negatives. It also becomes tough to finalize the product delivery date, maintaining the documentation and the final product delivered to the customer is somewhat deviates from the original requirements.

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Here are some of the disadvantages of Agile:

- Planning really is not up to the mark
- Team must be knowledgeable
- Time commitment is not fulfilled from the developers
- Documentation is sometimes neglected

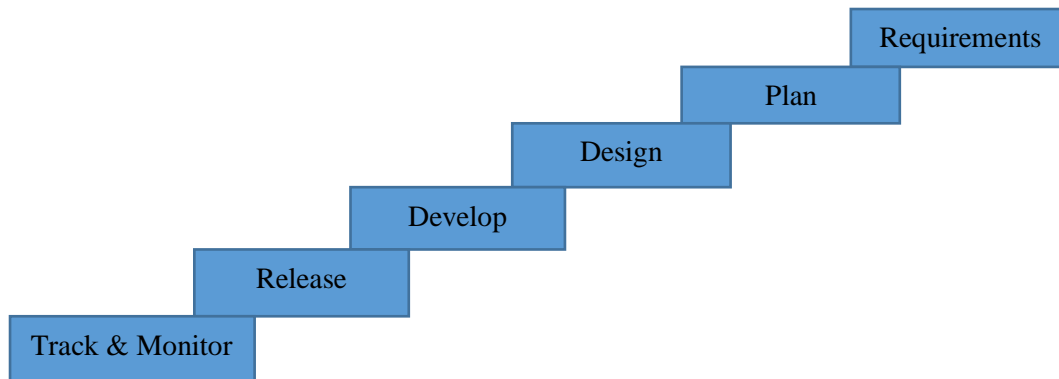


Fig 1: The Agile Development Cycle [3]

### Phases of Agile Development Planning:

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**Planning:** As soon the idea becomes feasible the complete project team works together and identifies the features. The basic aim of planning is to break down the idea into smaller pieces and then assign priority to each iteration.

**Requirements analysis:** This phase includes the meetings with managers, stakeholders, and users to identify all the business requirements. The team gathers the information like who will use the product and how they are going to use it.

**Design:** All the requirements determined in the previous phase are designed. The designing team needs to give it a thought as in how the product will look like.

**Implementation, coding or development:** After designing phase comes the implementation phase which follows the incremental approach. The iteration begins with 0 and continues with development with tasks like funding, finalizing contracts.

**Testing:** Once the code completion has done, it is put into the testing phase to make sure that the product is actually up to the customer's need and matching the user requirements. Various types of testings are done during this phase unit testing, integration testing, system testing, acceptance testing etc.

**Deployment:** After testing, the product is delivered to customers for them to use.

## III. SCRUM METHODOLOGY

### 1) What Is Scrum?

Scrum is a one of the classifications of Agile and is of the most popular and widely used frameworks for implementation of agile methodology. Scrum is a continual software development model that is used to manage a software and a product development which is complex in nature. It pursues length of definite iterations, known as sprints that last one to two weeks long.

As soon as one sprint comes to the end the stakeholders and team members plan next steps. Scrum also follows a set of roles and responsibilities, never change. For example, Scrum follows these steps in each sprint: sprint planning, daily stand-up, sprint demo, and sprint retrospective.

### 2) Advantages of Scrum:

Scrum is a highly injunctive framework with peculiar roles and ceremonies.

While it can be a plenty to learn, these rules have a lot of favourable factors. The benefits of Scrum include:

- More crystalline transparency and more project visibility and insight
- Increased in accountability among the team members
- Flexibility to accommodate changes
- Reduction of expenses

### 3) Disadvantages of Scrum

While Scrum has some advantages it also has a few disadvantages: Here are the disadvantages of Scrum:

- Risk of scope creep
- Team requires intense experience and absolute commitment
- An ineffective Scrum Master can ruin everything
- Poorly defined tasks can lead to inaccuracies

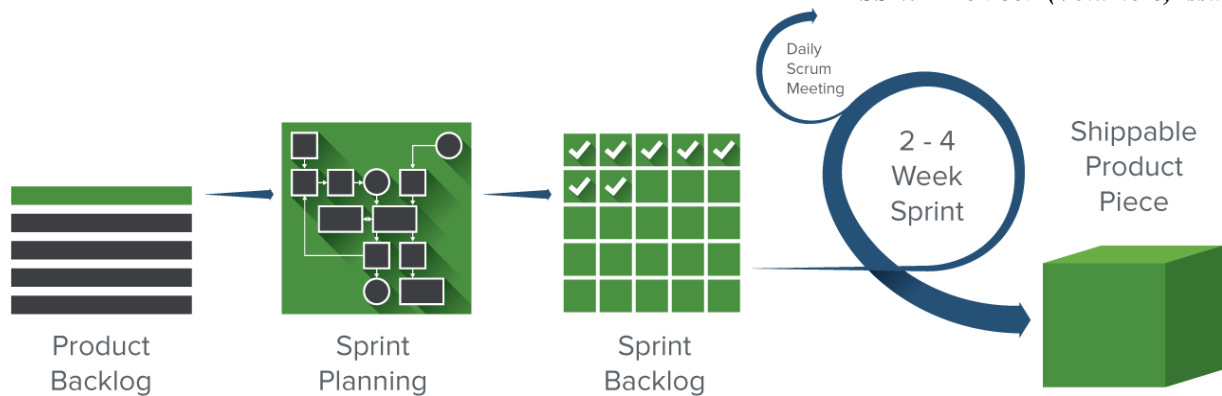


Fig 2: Steps in the Scrum Process [6]

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**Product backlog:** The owner of the Product and the Scrum team define and mark the priority on the product backlog. The product backlog does not include a bunch of things to be completed but instead the desired features of the product.

**Sprint planning:** Before each sprint takes place, the owner of the product checks the previous item on the backlog to the team. The team then makes a choice which work they can execute and finish during the sprint and moves that particular work within the product backlog to sprint backlog.

**Backlog refining:** At the closing of each and every sprint the sprint team and Product owner ensure that the backlog is ready for the next sprint. The team removes users that are not relevant and creates new users with tasks and further splits the large tasks into smaller ones. The basic purpose of this refinement is to ensure that the backlog only contains the items that are relevant.

**Daily Scrum meetings:** There are Daily Scrum meetings that is a 15-minute stand-up meeting where all the team members discuss about their goals and so far they have faced any issue or not. **Sprint review meeting:** At the culmination of each sprint the team has to present the work that has been completed so far. This meeting does not include a report submission or a power point based presentation else it has a live demonstration of the work completed till date.

**Sprint retroactive meeting:** At the end of each sprint the team checks how well the scrum is working and if any changes are required for the next sprint.

**Agile Vs. Scrum**

1) Differences and Similarities Between Agile and Scrum

	SCRUM	AGILE
Philosophy		X
Methodology	X	
Adds Process	X	
Transparency	X	X
Deliver software early	X	X
Iterative	X	X
Accommodates change	X	X
Continuous improvement	X	X

As we know Agile and Scrum follow the same process but still there are some differences when we compare Scrum and Agile. Agile describes some guidelines and principals for building software through continual development while Scrum follows a specific set of rules.

Agile is the philosophy and Scrum is the methodology that is used to implement the Agile philosophy. So both are inter related. Also Scrum is one of the methods to follow and implement Agile philosophy therefore they share some similarities. Both these methods focus on delivering software early and often, are iterative processes, and accommodate change.

They also encourage transparency and continuous improvement.

**Improving Scrum Model:**

There are also many agile methods, one of them is XP. It is a set of practices that conforms to the core values and principles of Agile. Also there are some differences between Scrum and XP but still we'll be fair to say Scrum is a subset of XP.

Scrum can be improved by adding many practices of extreme programming (XP methodology) such as Pair Programming, Acceptance Testing, Continuous Integration, and Test Driven Development. At the end this helps to improve the quality of deliverables of each sprint, as there is always a risk involved in the standard scrum model but further combining it with few practices of XP methods, a high quality delivery can be achieved.

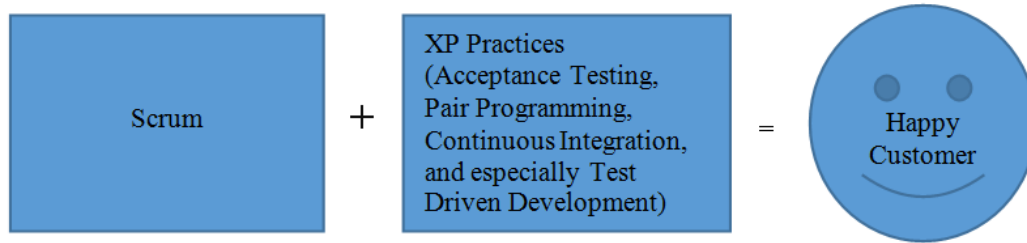


Fig 3: Method to achieve high quality delivery

#### IV. CONCLUSIONS

The agile methodology is meant to increase the flexibility, agility in the projects dealing in software development. The basic idea of Agile approach is to break down the large tasks into smaller ones which helps them to get completed within the given time span. Agile makes use of Scrum and XP. Methodology to improve the same. The application of these two depends on organization to organization.

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