UNIT-3

Agile Software Development

Agile Development: It is a software development method based on iterative and incremental development in which requirement and solutions evolve through collaboration between self organizing, cross functional teams. It was mainly intended for helping developers build a project which can adopt to transforming requests quickly. So, it was developed to make easy and rapid project achievement. It is also known as rapid software development or agile methods.

Agile Principles:

1. **Customer Involvement:** In agile development, customers are closely involved in the development team throughout the development process, to evaluate newly developed increaments and provide the feedback.
2. **Incremental Delivery:** Software is developed in increments with the customer specifying the requirements to be included in each increment.
3. **People not Process:** the skills of development team should be recognized and team members should be left to develop in their own ways of working.
4. **Embrace change:** Agile development process expects the system requirement to change as much as possible.
5. **Maintain Simplicity:** In agile development development team actively works to eliminate complexity from the system whereever possible.

Advantages of Agile Method:

→ Customer satisfaction by rapid, continious delivery of useful software.
→ Face-to-face conversation is the best form of communication.
→ Regular adaptation to changing circumstances.
→ Even late changes in requirements are welcomed.

Disadvantages of Agile Method:

→ Due to lack of formal documents, it creates different confusions.
→ Due to absence of proper documentation, maintenance of the developed project can become a problem.
→ The project can easily get taken off track if the customer is not clear what final outcome they want.
→ Only senior programmers are capable of taking decisions required during agile development process.

When to use Agile Method:

→ When new changes are needed to be implemented. Agile method provides facility such that new changes can be implemented at very little cost because of the frequency of new increments that are produced.

→ To implement a new feature the developers need to lose only the work of a few days, or even only hours, to roll back and implement it.

→ When very limited planning is required to get started with the project.

→ When changes can be discussed and features can be newly affected or removed based on feedback.

⊛ Plan-Driven vs. Agile Development:

Plan-Driven Development	Agile Development
i) In plan-driven development all of the process activities are planned in advance and progress is measured against this plan.	i) In agile development, planning is incremental and it is easier to change the plan and software to reflect changing customer requirements.
ii) Iteration occurs within activities in plan-driven development.	ii) Iteration occurs across activities in agile development.
iii) We use this approach when we have a very detailed specification and design.	iii) We use this approach when very limited planning is required to get started with project.
iv) Sometimes it requires lower skill levels than agile based approach.	iv) Sometimes it requires higher skill levels than plan-driven approach.
v) It is more suitable for large systems.	v) It is more suitable for smaller systems.

⊛ Agile Development techniques: (less imp)

The most significant approach to changing software development culture was the development of Extreme Programming (XP).

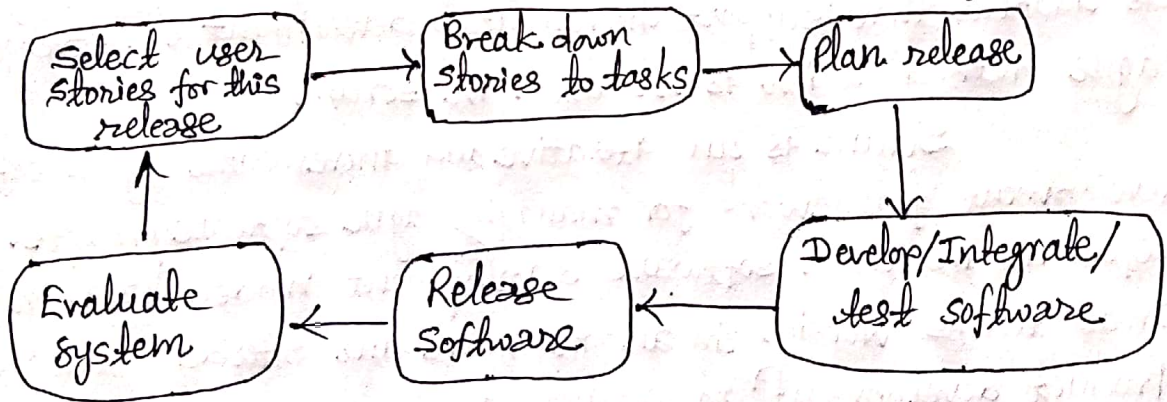

Fig: The XP release cycle.

Extreme Programming Practices:

Principle or practice	Description
Collective ownership	The pairs of developers work on all areas of the system. Anyone can change anything.
Continuous integration	As soon as the work on a task is complete, it is integrated to the whole system.
Incremental planning	Requirements are recorded on "story cards".
On-site customer	The customer should be available full time for the use of the XP team.
Pair programming	Developers work in pairs, checking eachothers work and providing the support.
Simple design	Enough design is carried out to meet current requirements.

Ⓐ Introduction to Agile Project Management:

Software project manager have to manage the software project so that the software is delivered on time and with the estimated budget for software. To accomplish this, manager have to follow the plan based approach and should have a stable view of everything that has to be developed. But in agile methods requirement are developed incrementally, and delivered in short time interval. To manage agile project, different approach to project management is adapted that support incremental development and strength of agile method which is realized in scrum.

Scrum is an iterative and incremental agile software development framework for managing agile software projects. It refers to the agile software development model based on multiple small teams working in an intensive and interdependent manner. Product development in scrum occurs in small pieces, with each piece building up on previously created pieces.