AGILE DEVELOPMENT PROCESS

* What is Agility ?

- means effective response to change, effective communication among all stakeholders

- Ability to move Quickly & easily
- Ability to think & understand Quickly.

- AGILE Process -

- It is iterative & incremental Process
- Direct Collaboration with customers
- Each iteration last for one to three weeks
- Delivers multiple S/W increments.

- Agile is one of the worlds most widely used & recognized software development framework.
- Agile is not a set of rules, Agile is not a set of guidelines, it is not even methodology. Rather it is a set of Principles

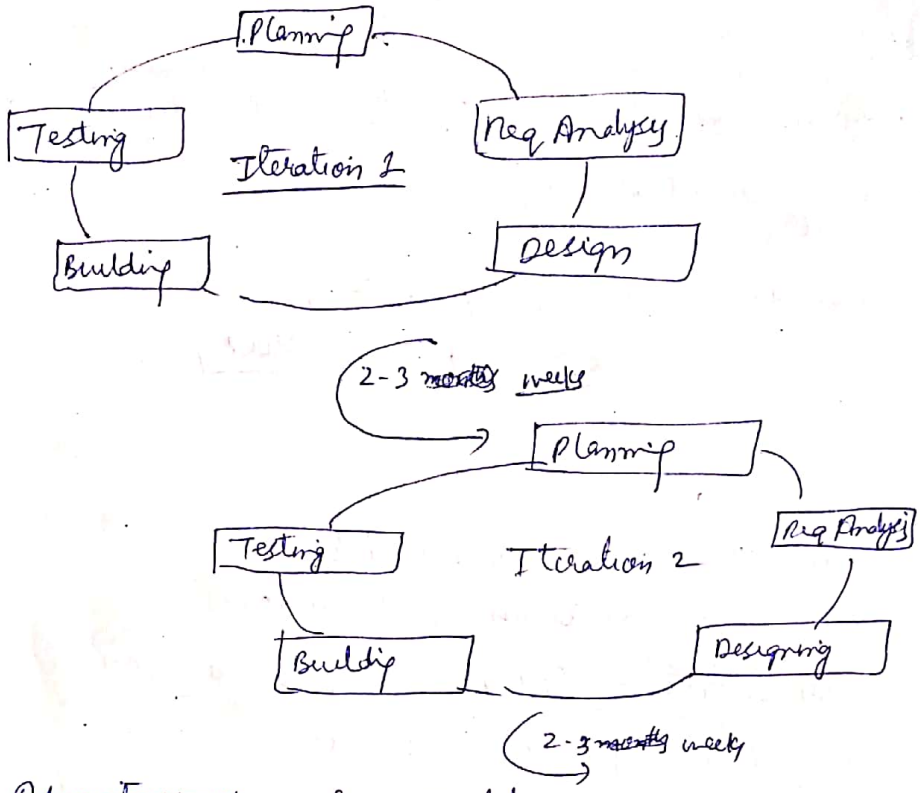
Agile Methodology ? is a Practise That Promotes Continuous iteration of development & testing throughout SDLC of Project. Both development & Testing activities are concurrent unlike the waterfall model. (Cont testy)

Agile S/W development emphasizes on four core values

1. Individual & team interaction over Process & Tools
2. Working S/W over Comprehensive documentation
3. Customer Collaboration over contract negotiation
4. Responding to change over following a Plan.

Agile Manifesto - Study 12 Principle

Graphical illustration of Agile Model



Advantages of Agile Methodology

1. Customer continuously gets a look & feel of the Project Progress at the end of each iteration/sprint
2. Each sprint provides customers with a working S/w which meets their expectations.
3. The development teams are Quite responsive to the changing requirements & can accomodate changes even in the advanced stages of development.
4. There is a constant two way communication which keeps the customers involved, all stakholders (business & technical) have a clear visibility of the Project
5. Design of Product is efficient & fulfills the business requirements.
6. Realistic approach

Disadvantages

✗ (1) Requirement not crystal clear at the biging of the Project

✗ (2) Comprehensive documentation not preferred

(3) Not Suitable for handling complex dependencies

(4) An overall plan, an agile leader & agile PM Practise is a must without which it will not work

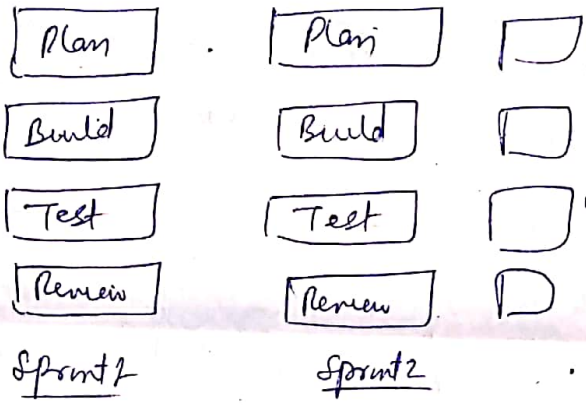
(5) There is very high individual dependency as there is minimum documentation generated

VARIOUS AGILE METHODOLOGIES

1. SCRUM → 1995
2. Extreme Programming (XP) — 1996
3. Adaptive S/w development (ASD) — (1995)

SCRUM - Can be considered to be the most popular agile framework

- It concentrates on how to manage tasks within a team based development environment.
- It believes in empowering the development team & advocates working in small teams (say 7 to 9 members)



- Several incremental releases called SPRINTS
- Sprint usually takes 2-3 weeks & keep on repeating until Product is feature complete

a) **3 Roles in Scrum**

1. **Product owner** – responsible for defining the features that are needed in the Product
2. **Scrum Master** – Leader of the team : Running the meetings
3. **Development team** – Testers, coders etc

b) **3 Artifacts / documents**

object made by human hand.

- **Product Backlog** – Create a Prioritized list of features. This is a repository where req are tracked with details.
- **Sprint backlog** – no. of sprints done
- **Product increment** –

AGILE Vs TRADITIONAL SDLC MODELS

① · AGile is based on adaptive S/w development method where as Traditional SDLC models are based on Predictive approach (detailed Planing & have a complete forecast of exact tasks & features to be delivered)

② Predictive methods entirely depend on requirement analysis & Planning.

In adaptive approach - there is no detailed planning & there is clearity on future tasks only in respect of what features need to be developed.

③ Customer interaction is the backbone of agile methodology & open communication with minimum documentation.

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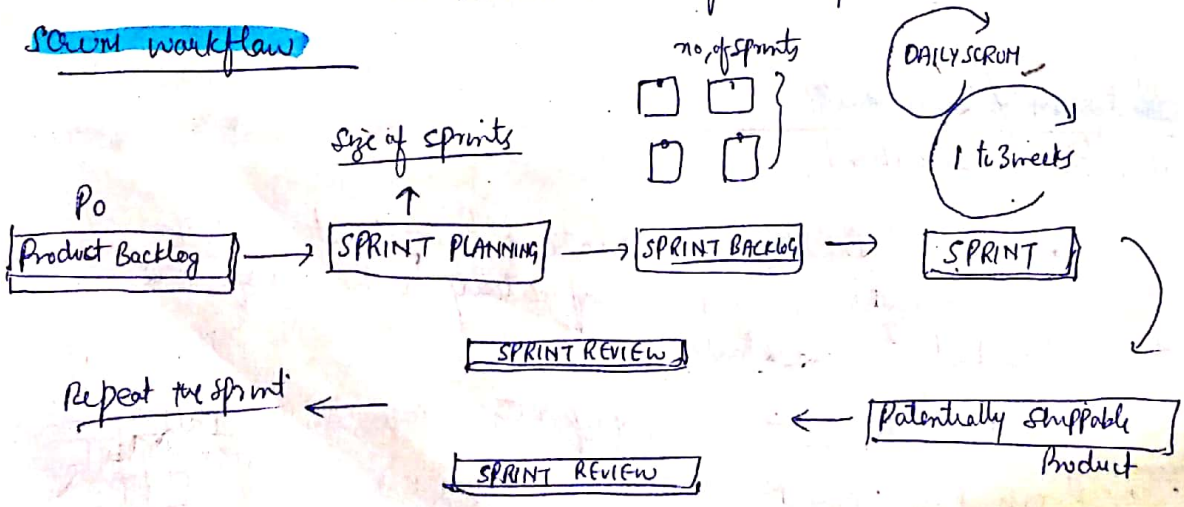
c) 3 Events in Scrum

- Sprint Planning - where PO, Scrum master & team meet to discuss user stories & estimate relative sizes
- Daily Scrum - is a brief stand up meetup where team discusses what has been completed
- Sprint review - occurs at the end of each sprint demonstrates completion of work to Product owner (PO)

Scrum workflow



(2) Extreme Programming (XP)

- XP is a Software Engineering methodology used to improve S/w quality & response to customer's requirements.
- Extreme Programming is based on following values
  - Communication . Simplicity . Feedback
  - Small iterations . Design . Code review
  - Testing . Incremental development

BASIC Principles of Extreme Programming

1. **Planning** - • Planning activity begins with the creation of a set of stories① (user stories) that describe required features & functionality for S/w to be build.
   ② **Values** - Each story is written by the customer & is placed on an index card. The customer assign a value (ie Priority). The stories with highest value will be moved up in the schedule & implemented first.
   ③ **Project velocity** - After first project release (also called S/w increment) has been delivered, XP team computes Project velocity.
   ↓
   no. of customer's stories implemented during first release.

2. **DESIGN** - ⓐ **Simple design** - XP design follows the KIS (keep it simple) Principle.
   ⓑ **CRC (class responsibility collaborator)** - XP encourages use of CRC cards. It is an effective mechanism for thinking about S/w in object oriented context.

c) **Spike Solution** – If a design is difficult, then XP recommends immediate creation of an operational prototype of that portion of design called spike solution. The intent is to lower risk when true implementation starts

(3) **CODING** –a) XP recommends that after stories are developed & preliminary design work is done, the team should not move to code but rather develop a series of unit tests that will exercise each of the stories that is to be included in the current release.

↓

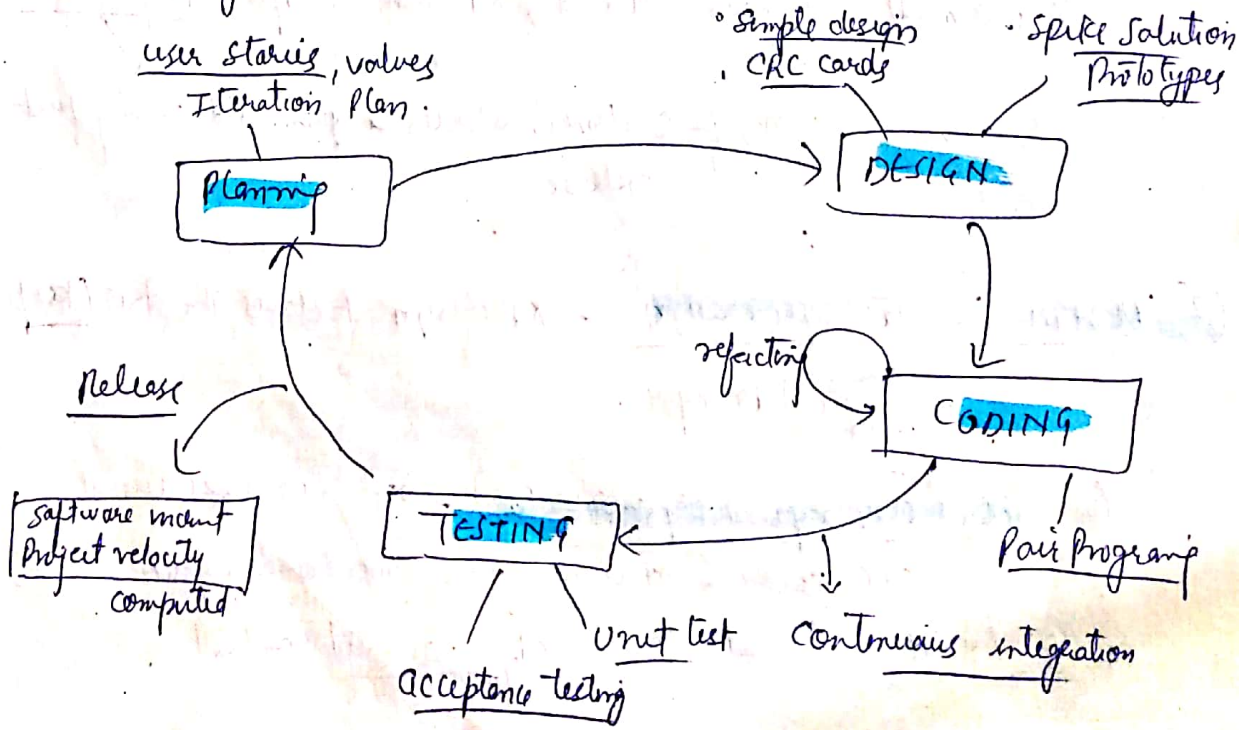
After once unit test has been created, the developer is better able to focus on what must be implemented to pass the unit test.

b) **Pair Programing** – Improves Quality
Keeps developers focussed

c) **Refactoring** – technique for restructuring an existing code alter its internal structure without changing its external behaviour

(4) **TESTING** –

a) **Acceptance test** – also called customer tests reviewed by the customer



ications of XP

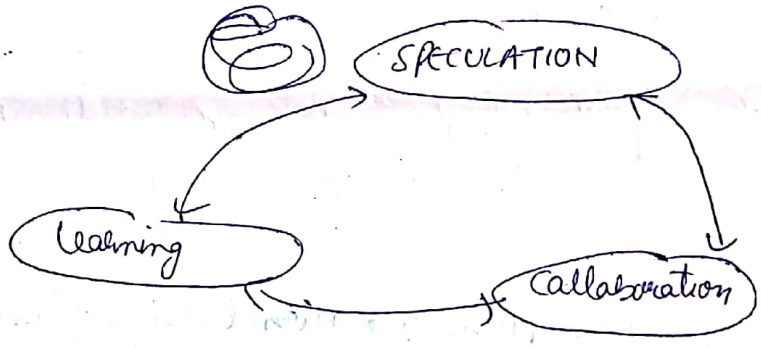
- Small Projects – very useful in small Projects consisting of small team as face to face meeting is easier to achieve
- Project mainly new technology or Research Projects

(3) Adaptive Software Development (ASD)

- Adaptive Software development (ASD) has been proposed by Jim Highsmith as a technique for building complex S/w systems.

ASD life cycle incorporates 3 phases

(1) SPECULATION (2) Callaboration (3) Learning



Speculation – During Speculation, the Project is initiated & adaptive cycle Planning is conducted.

i.e. • customer's mission statement
• Project constraints (delivery date / user description)
• Basic requirements.

Callaboration – Motivated people work together in a way that multiplies their talent & creative o/p.

callaborate would require the ability to work jointly to produce results, share knowledge or make decisions

Learn - is a vital for the success of the Project - Team has to enhance knowledge constantly using Practices such as

- Technical reviews
- Project Retrospectives (looking backwards)
- Customer focus groups

Review should be done after each iteration. Iterations should be short.

Observations

1. It is difficult to collaborate without learning or to learn without collaborating
2. It is difficult to speculate without learning or to learn without speculating
3. It is different to speculate without collaboration or to collaborate without speculating.

Three Phases are non linear & overlap

Difference b/w SCRUM & XP

SCRUM	EXTREME PROG XP
(1) Scrum team iterations are from two weeks to one month	(1) XP team iterations are one or two weeks long
(2) Scrum team do not allow changes into their sprints once sprint Planning meeting is completed	(2) XP teams are much more amendable to change within Their iterations
(3) Scrum Product owner Prioritizes Product backlog but team determines the sequence in which they will develop ~~it~~ backlog items	(3) XP works in a strict Priority order developed by customer & teams works on them in that order

NOTE - DIFFERENCE BT AGILE & WATERFALL MODEL