What is Agility ?

In software engineering, agility refers to the ability of a development team or organization to respond quickly and effectively to changing requirements, customer feedback and market conditions.

It is a set of principles and practices that emphasize flexibility, collaboration and customer statisfaction

What is an Agile Process

Agile process addresses the concerns of unpredictability in the requirements, design, construction and testing of software development

Agile process —
- → Unpredictability of customer requirements
- → Design and constsuction are interlevaed
- → Analysis, Design, construction & Testing are not predictable.

Principles of Agile Developm..

(1) Sta satisfy the customer through early and continuous delivery of valuable software

(2) Welcome changing requirements, even late in development

(3) Deliver working software frequently, from a couple of weeks to a couple of months

(4) Business people and developers must work together daily throughout the project

(5) Give the team the environment and support they need, and trust them to get the job done

(6) Emphasis for team's face-to-face conversation

(7) Working software is the primary measure of progress

(8) The sponsors, developers, and users should be able to maintai a constant pace indefinitely

(9) Continuous attention to technical excellence and good design enhances agility.

(10) Simplicity, the art of maximizing the amount of work not done is essential

(11) The best architectures, requirements and designs emerge from self-organizing teams

(12) At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour.

Characteristics of Agile Dev...

(1) Iterative Development

(2) Continuous feedback

(3) Collaborative approach

(4) Adaptive planning

(5) Customer involvement

(1) Iterative Development

Breaking down the development process into smaller, manageable iterations (usually called sprints in Scrum) allows for frequent inspection & adaption.

(2) Continuous feedback

Regular feedback from customers, stakeholders, and team members helps identify and address issues early in the development process.

(3) Collaborative approach

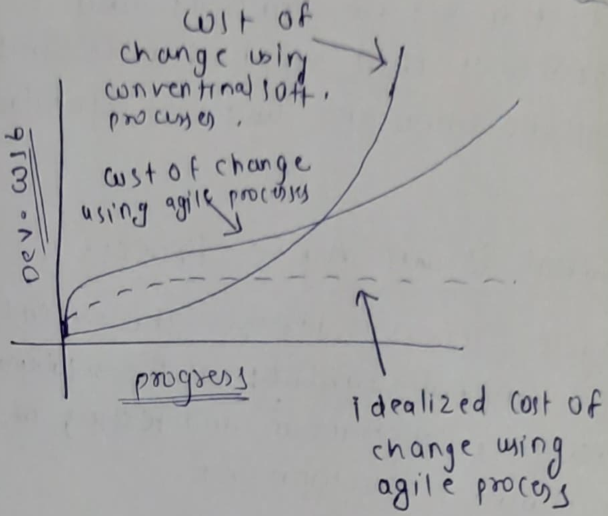
cross-functional teams work closely together, fastering communication & collaboration between team members with different skills and expertise.

(4) Adaptive planning

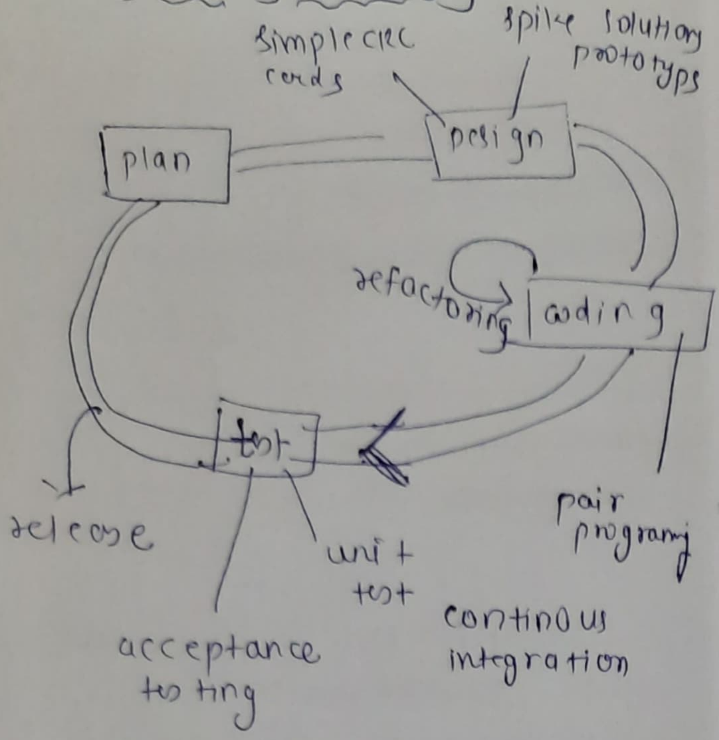
Rather than rigidly adhering to a fixed plan, agile teams are responsive to changes and can adjust their priorities and goals based on feedback and evolving requirements.

(5) Customer involvement

Customers or stakeholders are involved throughout the development process to ensure that the delivered product meets their expectations.



Extreme Programming



(1) planning

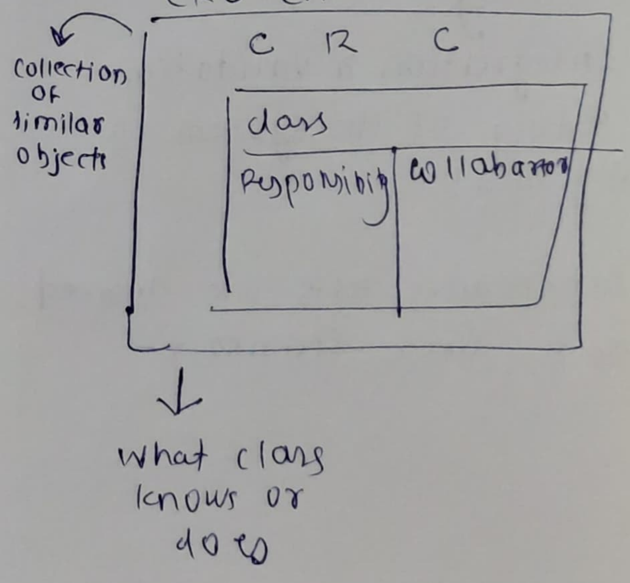
- Begins with listening - a requirements gathering activity
- Listening leads to the creation of a set of "stories" (user stories) that describe required output, features, and functionality for software to be built.
- Members of the XP team then assess each story and assign a cost (in weeks)
- customers and developers work together to decide how to group stories into the next release
- XP team computs project velocity

(2) Design

CRC → collaboration
↳ class
↳ Responsibility

- CRC cards are a design technique used in object-oriented software development to collaborotively define classes and their responsibilities
- A spike solution used in software development to explore and learn more about a particular technology concept, or problem.
- The primary goal of a spike is to reduce uncertainty and gather information that can inform subsequent dev. activities.

CRC CARDS



3) Coding

- Refactoring in coding refers to the process of restructuring existing code without changing its external behavior.

- The primary goal of refactoring is to improve the internal structure of the code to make it more readable, maintainable, and efficient, without altering its observable functionality

Pair Porgramming is an Agile software development technique in which two programmers work together at one computer.

"Driver" - "observer"

The code is continuosly tested and integrated for rapid delivery.

4) Testing

- Integration & validation testing of the system on daily basis.

- Acceptance tests are derived from user stories.

SCRUM

① It provides a structured yet flexible way for teams to Collaborate on complex projects and deliver high-quality products iteratively.

② The Scrum framework includes roles such as the Product Owner, Scrum Master, and Development TEAM

③ further, it defines ceremonies such as Sprint Planning, Daily Scrum meeting, Sprint Review, and Sprint Retrospective.

④ Scrum aims to deliver an MVP (minum viable product) at the end of each Iteration called Sprint. Each sprint should add value to the developed project

Terms in SCRUM

Backlog -
a prioritized list of project requirements or features that provides business value for the customer.

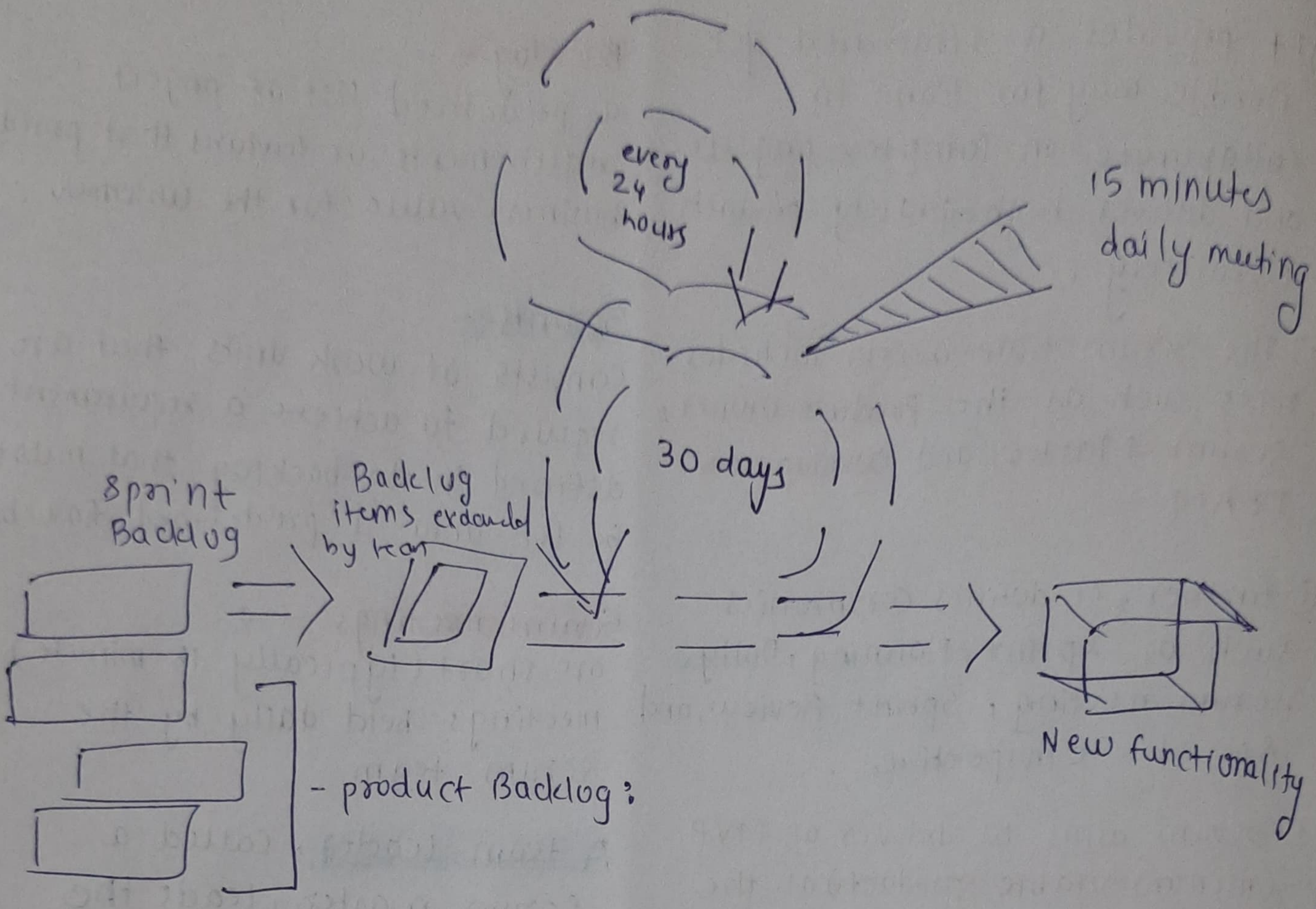
Sprints -
consists of work units that are requird to achieve a requirement defined in the backlog that must be fit into a predefined time-box

Scrum meetings - o
are short (typically 15-minute) meetings held daily by the scrum team

A team leader, called a scrum master, leads the meeting and assesses the responeses from each person

Demos -
Deliver the software increment to the customer.

Flow


every 24 hours
15 minutes daily meeting
30 days
Sprint Backlog
Backlog items expanded by team
New functionality
- product Backlog :

Difference

Extreme Programming (XP)	SCRUM
(1) Continous Development	Iterative development
(2) Equal roles, no hierarchy, everyone has shared ownership	Three key roles : (1) Product Owner (2) Scrum Master (3) Development Team
(3) Entire team is responsible for all aspects of the project	Team is responsible for delivering a potentially shippable product increment at the end of each sprint
No formal structure	Daily stand-up meetings, sprint planning, Sprint review, sprint retrospective, backlog refinement
No Fixed length	Fixed-length sprints, usually 2-4 weeks
No fixed time boxing	Uses time-boxing to ensure that sprints are completed on time