**What Is Agile Methodology?**

Agile is a **project management and product development approach** that emphasizes:

* **Iterative development** (small, frequent releases)
* **Collaboration** between cross-functional teams
* **Customer feedback** and adaptability to change

Instead of delivering a final product all at once, Agile teams deliver working increments regularly, allowing for continuous improvement.

**Advantages of Agile**

* **Flexibility**: Easily adapts to changing requirements
* **Customer satisfaction**: Frequent delivery keeps users engaged
* **Improved quality**: Continuous testing and integration
* **Transparency**: Regular updates and reviews
* **Team empowerment**: Encourages self-organizing teams

**Disadvantages of Agile**

* **Less predictability**: Hard to estimate timelines and budgets
* **Requires experienced teams**: Not ideal for beginners
* **Documentation may suffer**: Focus is on working software
* **Customer availability**: Needs frequent stakeholder input
* **Scaling challenges**: Can be tricky for large organizations

**12 Principles of the Agile Manifesto**

1. Satisfy the customer through early and continuous delivery
2. Welcome changing requirements—even late in development
3. Deliver working software frequently
4. Business and developers must work together daily
5. Build projects around motivated individuals
6. Face-to-face conversation is the best form of communication
7. Working software is the primary measure of progress
8. Promote sustainable development
9. Continuous attention to technical excellence
10. Simplicity—the art of maximizing work not done
11. Best results come from self-organizing teams
12. Regular reflection and adjustment

**Scrum Master**

The **Scrum Master** is the team’s coach and facilitator:

* Ensures the team follows Scrum practices
* Removes obstacles (blockers)
* Facilitates meetings (daily standups, retrospectives)
* Promotes collaboration and continuous improvement
* Shields the team from distractions

**Product Owner**

The **Product Owner** is the voice of the customer:

* Defines the product vision
* Manages the product backlog
* Prioritizes features based on value
* Collaborates with stakeholders
* Ensures the team builds the right product

**How Agile Teams Plan Their Work**

Agile planning happens at multiple levels:

1. **Vision**: Long-term product goals
2. **Roadmap**: High-level timeline of features
3. **Release Planning**: What to deliver and when
4. **Sprint Planning**: What to build in the next 1–4 weeks
5. **Daily Standups**: What’s done, what’s next, any blockers
6. **Sprint Review & Retrospective**: Feedback and process improvement

**Scrum Framework Overview**

Scrum is a **popular Agile framework** with:

* **Roles**: Product Owner, Scrum Master, Development Team
* **Artifacts**: Product Backlog, Sprint Backlog, Increment
* **Events**: Sprint, Sprint Planning, Daily Scrum, Sprint Review, Retrospective

Each Sprint (usually 2–4 weeks) delivers a usable product increment.

**Uses of Scrum**

Scrum is ideal for:

* Software development
* Product design
* Marketing campaigns
* Research projects
* Any complex, adaptive work

**Applications of Scrum in Project Management**

Scrum helps project managers:

* Break down work into manageable chunks
* Prioritize based on value
* Adapt quickly to feedback
* Improve team collaboration
* Deliver faster and more reliably

**Advantages of Scrum in Project Management**

* Fast delivery of working product
* High transparency and accountability
* Continuous feedback and improvement
* Encourages innovation and creativity
* Reduces risk through short iterations

**Disadvantages of Scrum in Project Management**

* Requires experienced, self-organizing teams
* Daily meetings can feel excessive
* Hard to scale for large teams
* Estimating costs and timelines is difficult
* May not suit projects with fixed scope and budget