Agile Methodology:

Agile Methodology is a way to manage projects by breaking them into smaller parts. It focuses on working together and making constant improvements. Teams plan, work on the project, and then review how things are going in a repeating cycle. They prioritize flexibility, collaboration, and customer satisfaction.

Life cycle of Agile Methodology

1. Requirement Gathering

- In this stage, the project team identifies and documents the needs and expectations of various stakeholders, including clients, users, and subject matter experts.

- It involves defining the Project's Scope, objectives, and requirements.

- Establishing a budget and schedule.

- Creating a project plan and allocating resources.

2. Design

- Developing a high-level system architecture.

- Creating detailed specifications, which include data structures, algorithms, and interfaces.

- Planning for the software's user interface.

3. Development (Coding)

- Writing the actual code for the software.

- Conducting unit testing to verify the functionality of individual components.

4. Testing

This phase involves several types of testing:

- **Integration Testing:** Ensuring that different components work together.

- **System Testing:** Testing the entire system as a whole.

- **User Acceptance Testing**: Confirming that the software meets user requirements.

- **Performance Testing:** Assessing the system's speed, scalability, and stability.

5. Deployment

- Deploying the software to a production environment.

- Put the software into the real world where people can use it.

- Make sure it works smoothly in the real world.

- Providing training and support for end-users.

6. Review (Maintenance)

- Addressing and resolving any issues that may arise after deployment.

- Releasing updates and patches to enhance the software and address problems.

Agile Principles:

Agile principles are guidelines for flexible and efficient software development. They emphasize frequent delivery, embracing change, collaboration, and continuous improvement. The focus is on delivering value, maintaining a sustainable work pace, and ensuring technical excellence.

12 Principles of Agile Methodology

Advantages of the Agile Model:

- **Flexibility and Adaptability**: Agile can quickly adapt to changes, allowing teams to respond to new customer needs and market conditions.

- **Improved Collaboration**: Agile encourages constant communication between developers and stakeholders, ensuring the product meets user expectations.

- **Faster Delivery**: Agile ensures quicker releases, keeping customers engaged and their feedback incorporated early.

- **Enhanced Quality and Customer Satisfaction**: Agile focuses on customer feedback, ensuring the product meets their needs and delivering high-quality results.

- **Iterative Development**: Work is done in small, manageable steps, allowing for regular improvements and quick adjustments.

- **Transparency**: Agile keeps stakeholders informed at every stage, ensuring clarity and alignment.

- **Quality Assurance**: Agile prioritizes quality, ensuring the product meets users' expectations through continuous improvements.

- **Continuous Improvement**: Regular feedback ensures the product keeps improving, preventing last-minute issues and maintaining high quality.