### **Project Methodologies**

### **1. Spiral Model**

* **Approach:** Combines iterative development with **risk analysis** at every phase.
* **Phases:** Planning → Risk Analysis → Engineering → Evaluation (repeated in spirals).
* ✅ **Best For:** Large, high-risk, and complex projects where risk management is crucial.
* 🔁 Iterative cycles allow continuous refinement.

### **💧 2. Waterfall Model**

* **Approach:** **Linear and sequential**. One phase is completed before the next begins.
* **Phases:** Requirements → Design → Implementation → Testing → Deployment → Maintenance.
* ✅ **Best For:** Projects with clear, fixed requirements and limited changes.
* ❌ Not flexible once development begins.

### **✅ 3. V-Model (Validation & Verification Model)**

* **Approach:** Extension of the Waterfall model; emphasizes **testing at each development stage**.
* **Structure:** Each development phase has a corresponding test phase (V-shaped flow).
* ✅ **Best For:** Projects requiring **high-quality validation** and thorough testing.
* 🧪 Early test planning leads to reliable outcomes.

### **🔄 4. Agile Model**

* **Approach:** **Iterative and incremental**, with a focus on collaboration, flexibility, and continuous delivery.
* **Process:** Develop in small cycles (sprints), gather feedback, and improve.
* ✅ **Best For:** Dynamic projects with changing requirements.
* 🤝 Promotes teamwork, customer involvement, and quick adjustments.