SDLC MODELS

1. Waterfall Model

The Waterfall Model is a linear and sequential SDLC approach where each phase must be completed before moving to the next.

Key Characteristics

- Rigid, structured, step-by-step flow
- No going back once a phase is completed
- Ideal for well-defined requirements

Phases

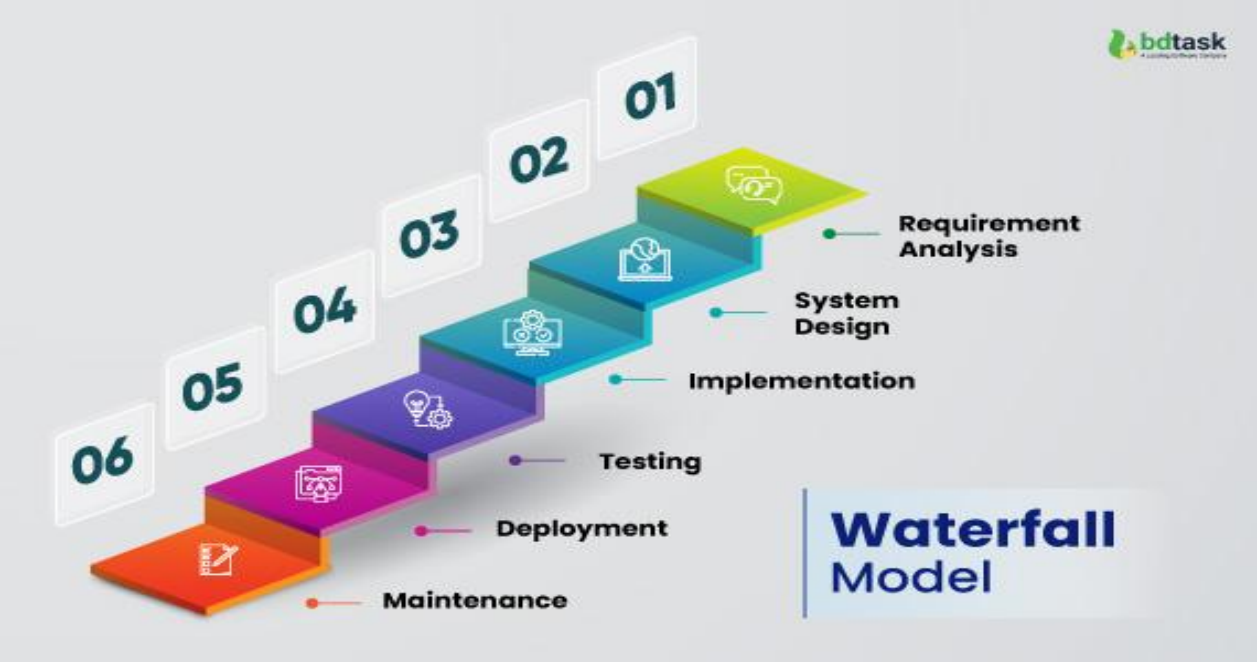
1. Requirements
2. System Design
3. Implementation
4. Testing
5. Deployment
6. Maintenance

Advantages

- Simple and easy to follow.
- Clear documentation
- Good for small or low-risk projects

Disadvantages

- No flexibility
- Cannot handle changing requirements
- Testing happens late



2. Agile Model

Agile is a **flexible, iterative**, and **incremental** software development model.
Work is divided into small cycles called **sprints** (1–4 weeks).

Key Characteristics

- Continuous feedback
- Rapid development
- Adaptability to change
- Customer collaboration

Phases (Repeat Every Sprint)

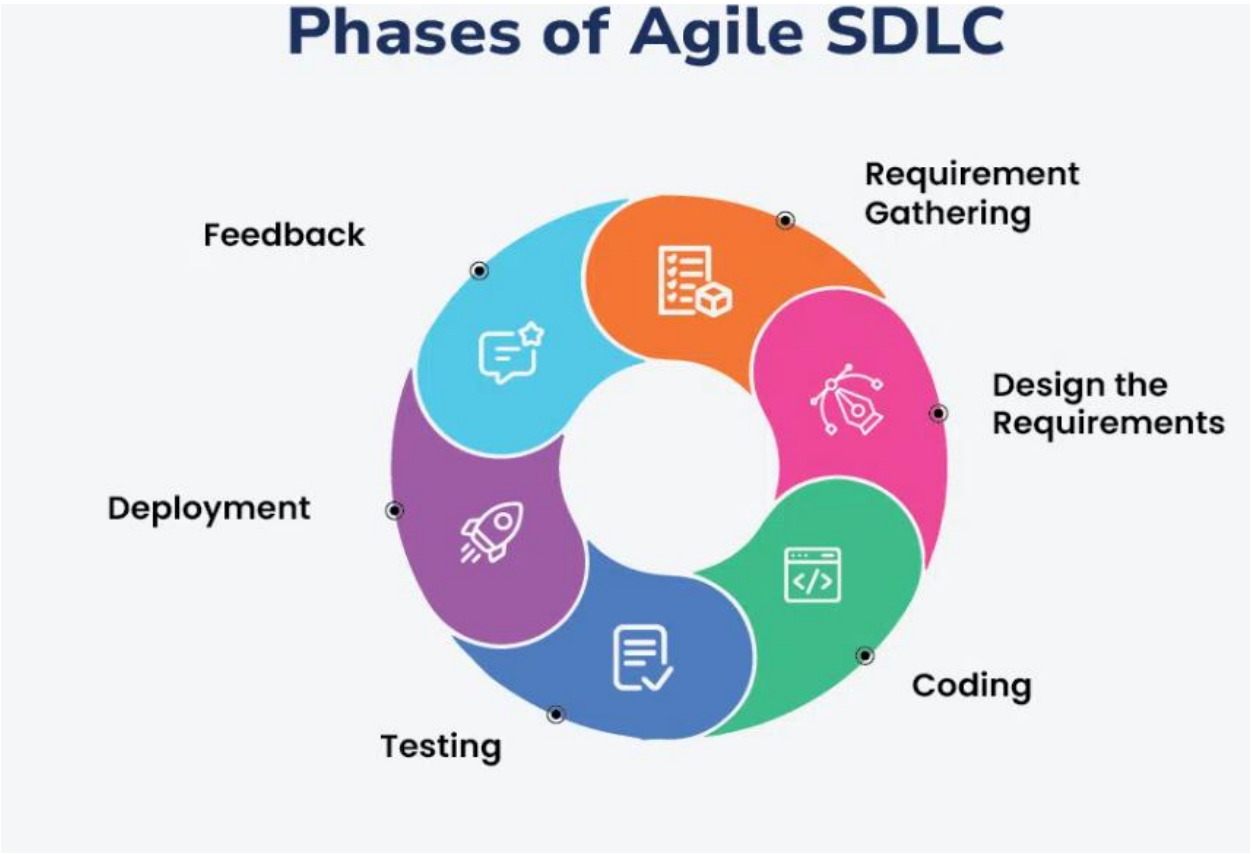
1. Requirement Discussion
2. Planning
3. Design
4. Development
5. Testing
6. Review & Feedback

Advantages

- Extremely flexible
- Continuous delivery
- Customer satisfaction

Disadvantages

- Requires skilled team
- Documentation is less detailed
- Hard to predict final cost/timeline



3. V-Model (Verification & Validation Model)

The V-Model is an extension of the Waterfall Model where **each development phase has a corresponding testing phase**.

Key Characteristics

- Parallel development and testing
- Focus on quality and validation
- Very structured and disciplined

Phases

Left Side (Verification)

- Requirements → System Design → Architecture → Module Design

Right Side (Validation)

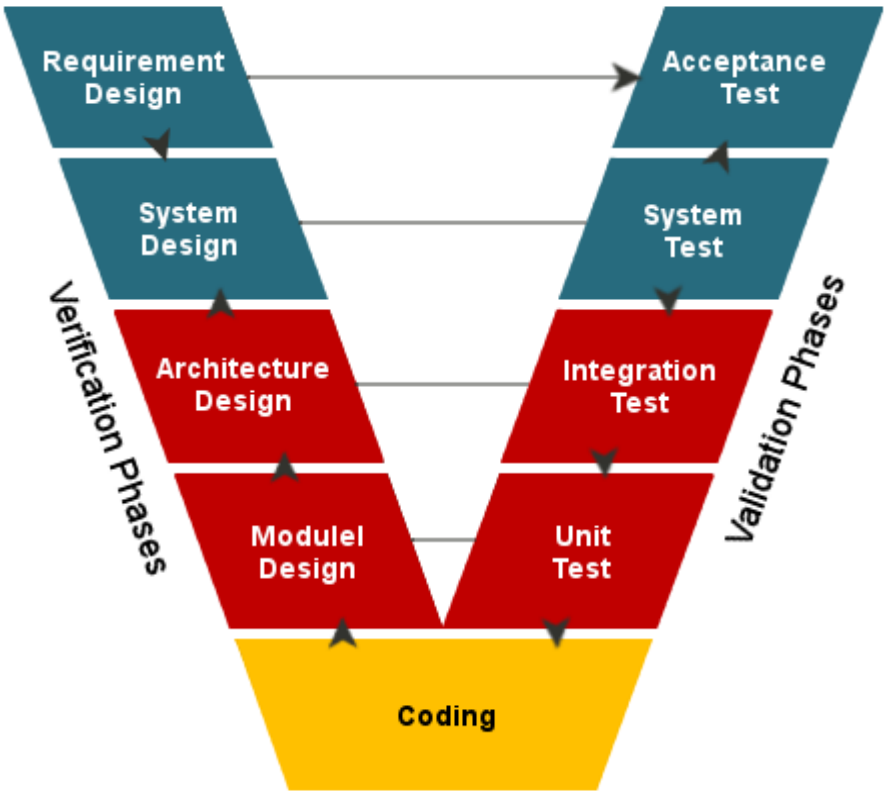
- Acceptance Testing
- System Testing
- Integration Testing
- Unit Testing

Advantages

- High quality
- Defects found early
- Clear test planning

Disadvantages

- Not flexible
- Changes are costly
- Not good for unclear requirements



4. Spiral Model

The Spiral Model combines **Waterfall + Iterative + Risk Analysis**.
The project moves in **rounds (spirals)**, each focusing on risk handling.

Key Characteristics

- Risk-driven approach
- Iterative and continuous improvement
- Suitable for large, complex projects

Four Phases (per spiral cycle)

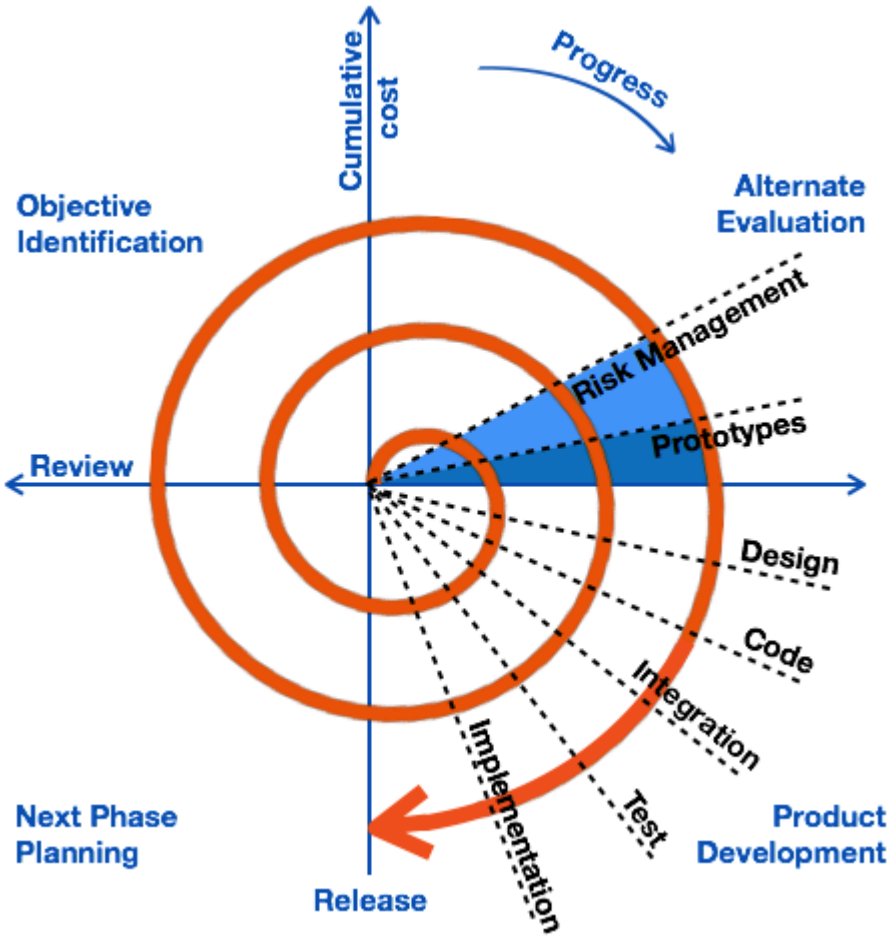
1. Planning
2. Risk Analysis
3. Engineering / Development
4. Evaluation

Advantages

- Best for risky projects
- Highly customizable
- Early detection of risks

Disadvantages

- Expensive
- Requires expertise
- Difficult to manage



Comparison Table

	Waterfall	Agile	V-Model	Spiral
Best For	Simple, predictable projects	Fast-changing requirements	Quality-focused projects	Large, risky projects
Flexibility	Low	Very High	Low	High
Risk Handling	Low	Medium	Medium	Very High
Development Style	Linear	Iterative	Linear + Parallel tes-	Iterative (Risk-based)