**1. Waterfall Model**

**Advantages:**

**- Clarity and Structure: Clear, sequential phases make it ideal for stable, well-defined requirements.**

**- Documentation Emphasis: Extensive documentation aids traceability and maintenance, crucial for regulatory compliance.**

**Disadvantages:**

**- Limited Flexibility: Hard to make changes after a phase is completed.**

**- Late Issue Discovery: Problems often surface late, leading to costly rework.**

**Applicability:**

**- Infrastructure Projects: Bridges, roads, buildings.**

**- Manufacturing Processes: Design and implementation.**

**2. Agile Model**

**Advantages:**

**- Flexibility and Adaptability: Iterative approach suits evolving requirements.**

**- Customer Collaboration: Regular feedback ensures the product meets user needs.**

**Disadvantages:**

**- Documentation Challenges: Less focus on documentation, problematic for compliance-heavy projects.**

**- Resource Intensive: High collaboration demands more resources.**

**Applicability:**

**- Software Development: Control systems, embedded systems.**

**- Prototyping and R&D: Iterative development and experimentation.**

**3. Spiral Model**

**Advantages:**

**- Risk Management: Continuous risk analysis and mitigation.**

**- Iterative Development: Allows refinement of complex designs.**

**Disadvantages:**

**- Complexity and Expertise: Needs experienced management and technical skills.**

**- Time and Resource Intensive: Longer cycles and more resources needed.**

**Applicability:**

**- Aerospace and Defense: High complexity, long cycles, stringent risk management.**

**- Medical Devices: Safety, reliability, and regulatory compliance.**

**4. V-Model**

**Advantages:**

**- Testing Emphasis: Early detection of defects through continuous testing.**

**- Clear Verification and Validation: Defined milestones and quality checks.**

**Disadvantages:**

**- Sequential Nature: Hard to implement changes later.**

**- Documentation Overhead: Extensive upfront planning and documentation.**

**Applicability:**

**- Regulated Industries: Healthcare, automotive, aerospace with rigorous testing and compliance needs.**