



Waterfall

This is the classical system development model. It consists of discontinuous phases:

1. Concept
2. Requirements
3. Architectural design
4. Detailed design
5. Coding and development
6. Testing and implementation

Strengths

- Minimizes planning overhead since it can be done up front.
- Structure minimizes wasted effort, so it works well for technically weak or inexperienced staff.

Weaknesses

- Inflexible
- Only the final phase produces a non-documentation deliverable.
- Backing up to address mistakes is difficult.

Spiral

The spiral is a risk-reduction oriented model that breaks a software project up into mini-projects, each addressing one or more major risks. After major risks have been addressed, the spiral model terminates as a waterfall model. Spiral iterations involve six steps:

1. Determine objectives, alternatives and constraints.
2. Identify and resolve risks.
3. Evaluate alternatives.
4. Develop the deliverables for that iteration and verify that they are correct.
5. Plan the next iteration.
6. Commit to an approach for the next iteration.

Strengths

- Early iterations of the project are the cheapest, enabling the highest risks to be addressed at the lowest total cost. This ensures that as costs increase, risks decrease.
- Each iteration of the spiral can be tailored to suit the needs of the project.

Weaknesses

- It is complicated and requires attentive and knowledgeable management to pull it off.

Modified Waterfall

The modified waterfall uses the same phases as the pure waterfall, but is not done on a discontinuous basis. This enables the phases to overlap when needed. The pure waterfall can also split into subprojects at an appropriate phase (such as after the architectural design or detailed design).

Strengths

- More flexibility than the pure waterfall model.
- If there is personnel continuity between the phases, documentation can be substantially reduced.
- Implementation of easy areas does not need to wait for the hard ones.

Weaknesses

- Milestones are more ambiguous than for the pure waterfall.
- Activities performed in parallel are subject to miscommunication and mistaken assumptions.
- Unforeseen interdependencies can create problem

Agile Project Management

APM is a highly iterative and incremental process, where developers and projects stakeholders actively work together to understand the domain, identify what needs to be built and prioritize functionality. Agile methods are used when these conditions are present: project value is clear, the customer actively participates throughout the project, the customer, designers and developers are collocated, incremental feature-driven development is possible and visual documentation is acceptable.

Extreme Project Management

An extreme project is a complex, high speed, self-correcting venture in search of a desirable result under conditions of high uncertainty, high change and high stress.”

Evolutionary Prototyping

Evolutionary prototyping uses multiple iterations of requirements gathering and analysis, design and prototype development. After each iteration, the result is analyzed by the customer. Their response creates the next level of requirements and defines the next iteration.

Strengths

- Customers can see steady progress.
- This is useful when requirements are changing rapidly, when the customer is reluctant to commit to a set of requirements, or when no one fully understands the application area.

Weaknesses

- It is impossible to know at the outset of the project how long it will take.
- There is no way to know the number of iterations that will be required.

Code-and-Fix

If you don't use a methodology, it's likely you are doing code-and-fix. Code-and-fix rarely produces useful results. It is very dangerous as there is no way to assess progress, quality or risk.

Strengths

- No time spent on "overhead" like planning, documentation, quality assurance, standards enforcement or other non-coding activities.

Weaknesses

- Dangerous.
- No means of assessing quality or identifying risks.
- Fundamental flaws in approach do not show up quickly, often requiring work to be

