Lecture Notes
On
System Analysis and Design
Spiral Model

UNIT-I & UNIT-II

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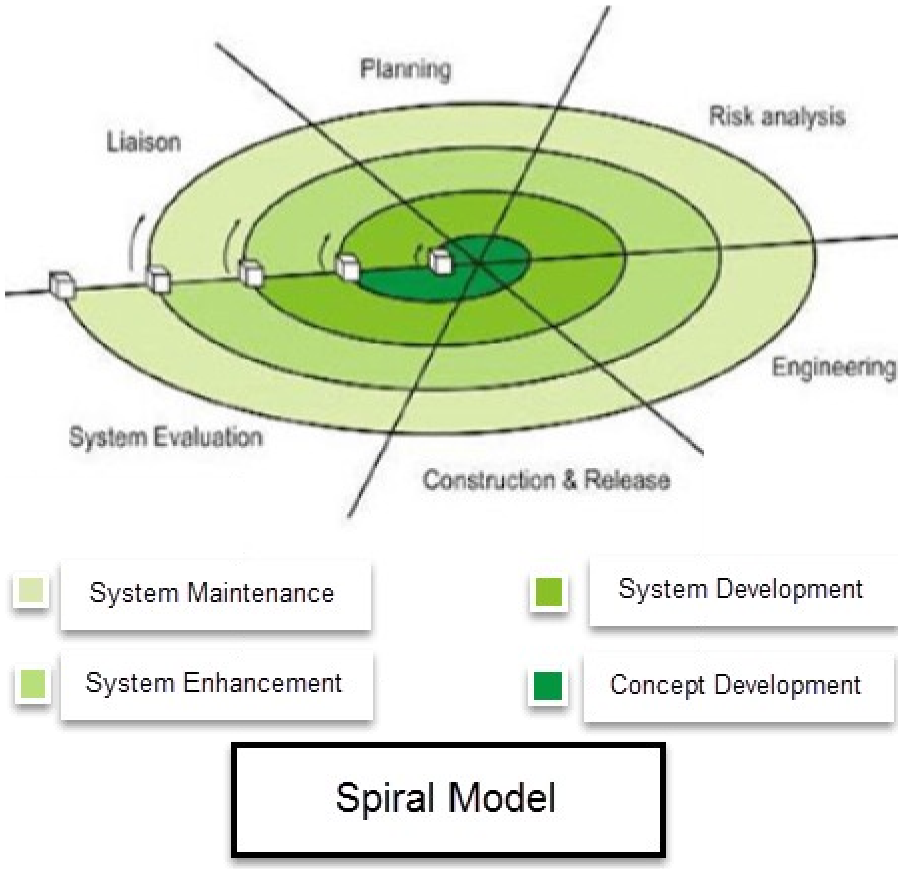
What is Spiral Model?

Spiral Model is a risk-driven software development process model. It is a combination of waterfall model and iterative model. Spiral Model helps to adopt software development elements of multiple process models for the software project based on unique risk patterns ensuring efficient development process.

Each phase of spiral model in software engineering begins with a design goal and ends with the client reviewing the progress.



Spiral Model Phases

Spiral Model Phases	**Activities performed during phase**
Planning	• It includes estimating the cost, schedule and resources for the iteration. It also involves understanding the system requirements for continuous communication between the system analyst and the customer
Risk Analysis	• Identification of potential risk is done while risk mitigation strategy is planned and finalized
Engineering	• It includes testing, coding and deploying software at the customer site
Evaluation	• Evaluation of software by the customer. Also, includes identifying and monitoring risks such as schedule slippage and cost overrun

When to use Spiral Model?

- A Spiral model in software engineering is used when project is large
- When releases are required to be frequent, spiral methodology is used
- When creation of a prototype is applicable
- When risk and costs evaluation is important
- Spiral methodology is useful for medium to high-risk projects
- When requirements are unclear and complex, Spiral model in SDLC is useful
- When changes may require at any time
- When long term project commitment is not feasible due to changes in economic priorities

Spiral Model Advantages and Disadvantages

Advantages	**Disadvantages**
• Additional functionality or changes can be done at a later stage	• Risk of not meeting the schedule or budget
• Cost estimation becomes easy as the prototype building is done in small fragments	• Spiral development works best for large projects only also demands risk assessment expertise
• Continuous or repeated development helps in risk management	• For its smooth operation spiral model protocol needs to be followed strictly

- Development is fast and features are added in a systematic way in Spiral development
- There is always a space for customer feedback

- Documentation is more as it has intermediate phases
- Spiral software development is not advisable for smaller project, it might cost them a lot

Iterative Model

In this Model, you can start with some of the software specifications and develop the first version of the software. After the first version if there is a need to change the software, then a new version of the software is created with a new iteration. Every release of the Iterative Model finishes in an exact and fixed period that is called iteration.

The Iterative Model allows the accessing earlier phases, in which the variations made respectively.

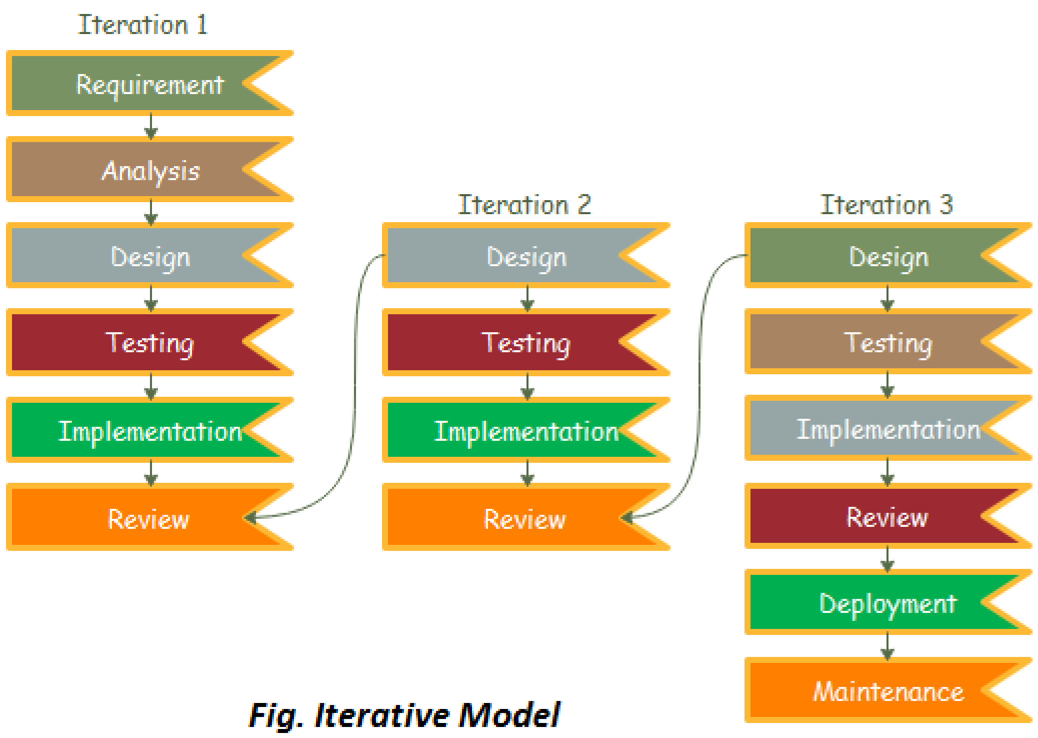


Fig. Iterative Model

When to use the Iterative Model?

1. When requirements are defined clearly and easy to understand.
2. When the software application is large.
3. When there is a requirement of changes in future.

Advantage(Pros) of Iterative Model:

1. Testing and debugging during smaller iteration is easy.
2. A Parallel development can plan.
3. It is easily acceptable to ever-changing needs of the project.
4. Risks are identified and resolved during iteration.
5. Limited time spent on documentation and extra time on designing.

Disadvantage(Cons) of Iterative Model:

1. It is not suitable for smaller projects.
2. More Resources may be required.
3. Design can be changed again and again because of imperfect requirements.
4. Requirement changes can cause over budget.
5. Project completion date not confirmed because of changing requirements.