SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107
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Department of Artificial Intelligence and Data Science

Object Oriented Software Engineering

The Spiral Model

Prepared By
R.Sowmiya, AP/AI&DS
SNSCE.

The Spiral Model

- The spiral model is an evolutionary software process model that couples the iterative nature of prototyping with the controlled and systematic aspects of the waterfall model.

- It provides the potential for rapid development of increasingly more complete versions of the software.

- The spiral development model is a risk-driven process model generator that is used to guide multi-stakeholder concurrent engineering of software intensive systems.

It has two main distinguishing features.

- One is a cyclic approach for incrementally growing a system's degree of definition and implementation while decreasing its degree of risk.

- The other is a set of anchor point milestones for ensuring stakeholder commitment to feasible and mutually satisfactory system solutions.

- A spiral model is divided into a set of framework activities defined by the software engineering team.

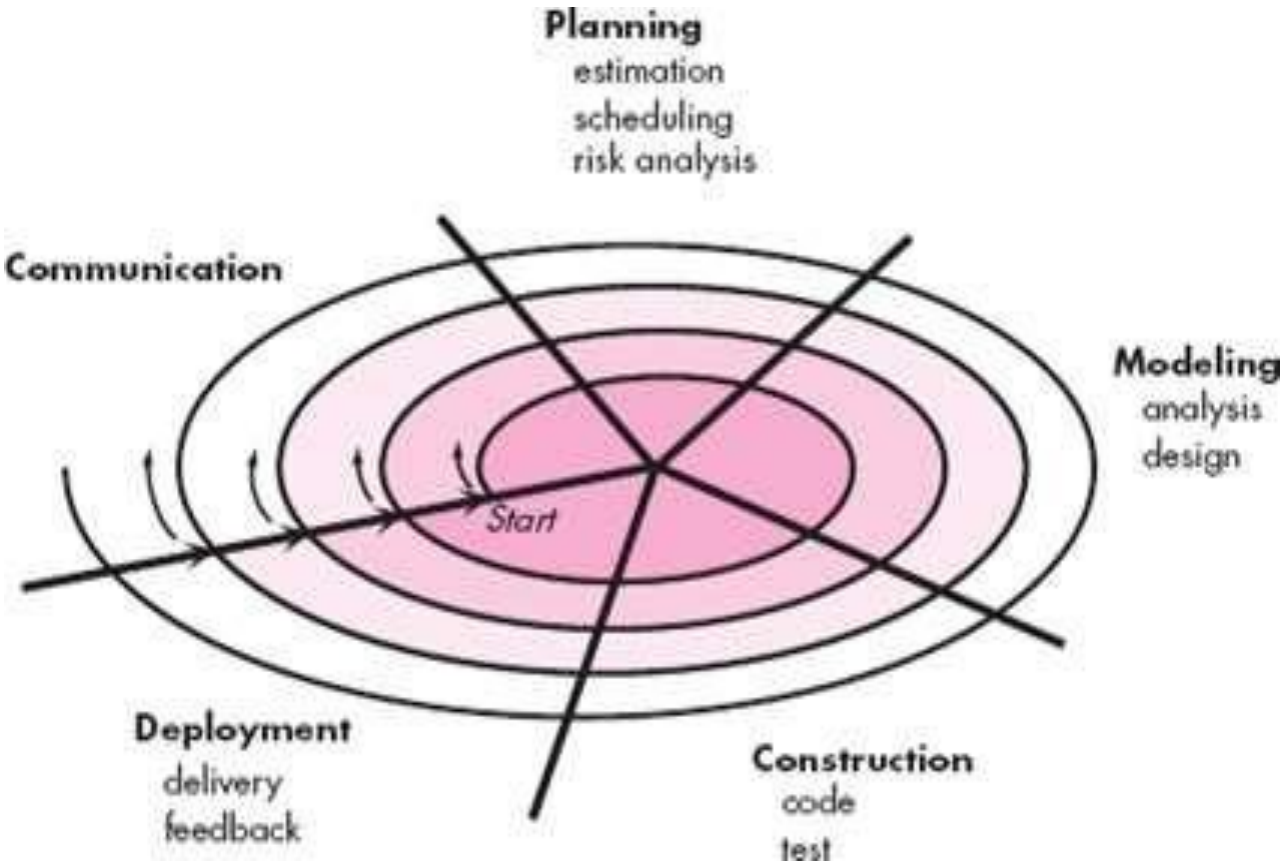
- Each of the framework activities represent one segment of the spiral path.

- The spiral model is a realistic approach to the development of large-scale systems and software.

- Because software evolves as the process progresses, the developer and customer better understand and react to risks at each evolutionary level.

- The spiral model uses prototyping as a risk reduction mechanism but enables you to apply the prototyping approach at any stage in the evolution of the product.
- It maintains the systematic stepwise approach suggested by the classic life cycle but incorporates it into an iterative framework that more realistically reflects the real world.
- The spiral model demands a direct consideration of technical risks at all stages of the project and, if properly applied, should reduce risks before they become problematic.

The Spiral Model



The functions of these four quadrants are discussed below-

- **Objectives determination and identify alternative solutions (Concept development projects):** Requirements are gathered from the customers and the objectives are identified, elaborated and analyzed at the start of every phase. Then alternative solutions possible for the phase are proposed in this quadrant.

- **Identify and resolve Risks (New product development projects):** During the second quadrant all the possible solutions are evaluated to select the best possible solution. Then the risks associated with that solution is identified and the risks are resolved using the best possible strategy. At the end of this quadrant, Prototype is built for the best possible solution.

- **Develop next version of the Product (Product Enhancement projects):** During the third quadrant, the identified features are developed and verified through testing. At the end of the third quadrant, the next version of the software is available.

- **Review and plan for the next Phase (product Maintenance projects):** In the fourth quadrant, the Customers evaluate the so far developed version of the software. In the end, planning for the next phase is started.

Advantages:

- High amount of risk analysis hence, avoidance of Risk is enhanced.
- Good for large and mission-critical projects.
- Strong approval and documentation control.
- Additional Functionality can be added at a later date.
- Software is produced early in the software life cycle.

Disadvantages:

- Can be a costly model to use.
- Risk analysis requires highly specific expertise.
- Project's success is highly dependent on the risk analysis phase.
- Doesn't work well for smaller projects.