SNS COLLEGE OF TECHNOLOGY

Coimbatore-35.

An Autonomous Institution

COURSE NAME : 19CST201 AGILE SOFTWARE ENGINEERING

II YEAR/ III SEMESTER

UNIT – I INTRODUCTION TO SOFTWARE ENGINEERING

UNIT I INTRODUCTION TO SOFTWARE ENGINEERING

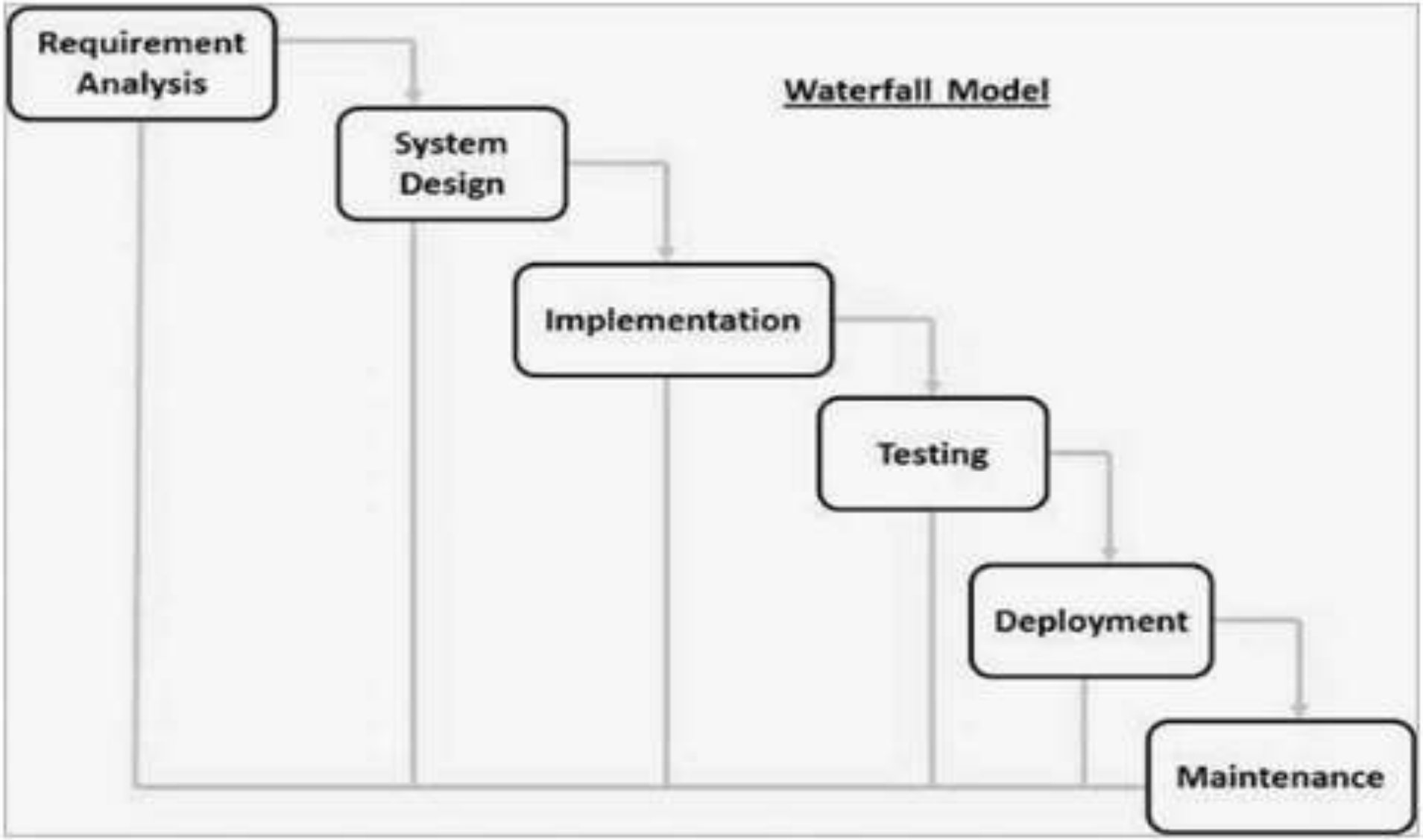
The Nature of Software -Software Engineering - Software engineering Practice – Process Models: Generic – Prescriptive – Specialized - United Process - Personal and Team Process Models - Process Technology-Understanding Requirements-Design concepts & model-Software quality concepts & Review metrics.

Prescriptive Process Models

There are three types of prescriptive process models. They are:

1. The Waterfall Model
2. Incremental Process model
3. RAD model

The Waterfall Model



The Waterfall Model

The sequential phases in Waterfall model are −

- Requirement Gathering and analysis
- System Design − helps in specifying hardware and system requirements and helps in defining the overall system architecture.
- Implementation − the system is first developed in small programs called units, which are integrated in the next phase.
- Integration and Testing − All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
- Deployment
- Maintenance − There are some issues which come up in the client environment to fix those issues, patches are released. Also to enhance the product some better versions are released.

The Waterfall Model

- The waterfall model is also called as **'Linear sequential model' or 'Classic life cycle model'.**
- In this model, each phase is fully completed before the beginning of the next phase.
- This model is used for the small projects.
- In this model, feedback is taken after each phase to ensure that the project is on the right path.
- Testing part starts only after the development is complete.

The Waterfall Model

Advantages :

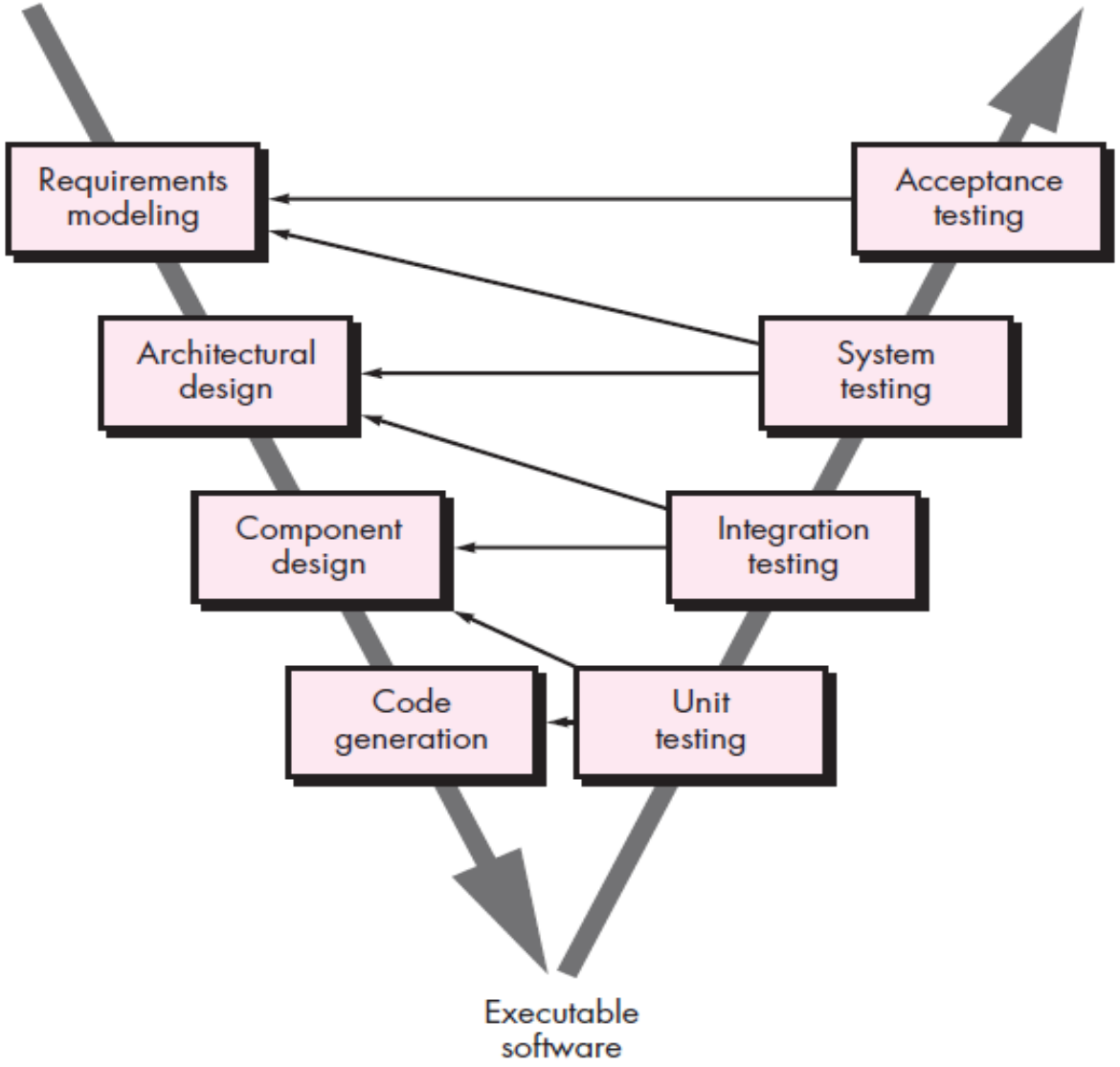
1. The waterfall model is simple and easy to understand, implement, and use.
2. All the requirements are known at the beginning of the project, hence it is easy to manage.
3. They should perform quality assurance test before completing each stage
4. Elaborate documentation is done at every phase of the software development cycle
5. Project is completely dependent on project team with minimum client intervention

The Waterfall Model

Disadvantages :

1. Error can be fixed only after the testing period
2. It is not suitable for a complex project
3. Documentation occupies a lot of time
4. Client valuable feedback cannot be included with ongoing development phase

V-Model


Requirements modeling
Architectural design
Component design
Code generation
Unit testing
Integration testing
System testing
Acceptance testing
Executable software

Incremental Process model

- The incremental model combines the elements of waterfall model and they are applied in an iterative fashion.

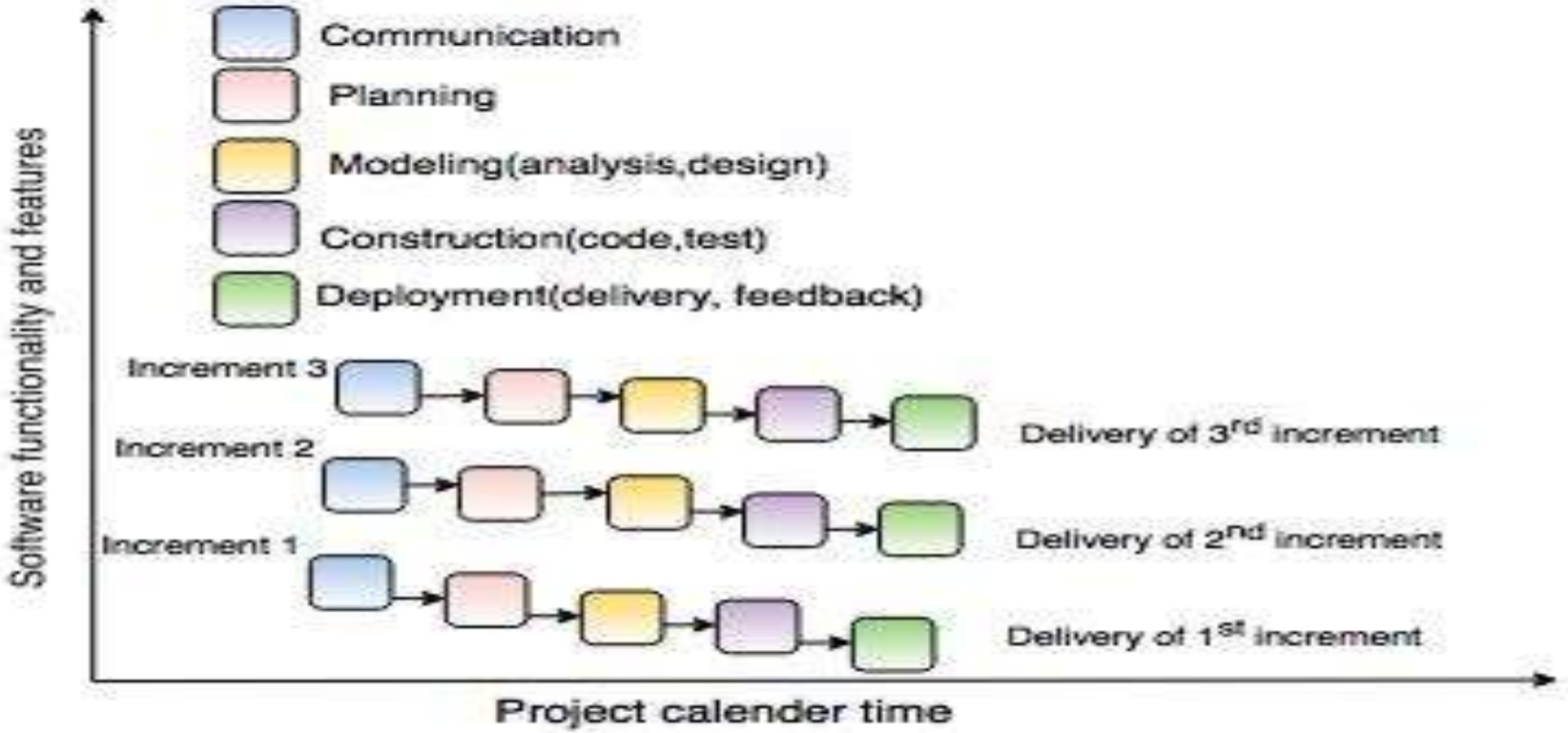


Fig. - Incremental Process Model

Incremental Process model

- The first increment in this model is generally a core product
- Each increment builds the product and submits it to the customer for any suggested modifications.
- The next increment implements on the customer's suggestions and add additional requirements in the previous increment.
- This process is repeated until the product is finished.

Incremental Process model

Advantages :

- This model is flexible because the cost of development is low and initial product delivery is faster
- It is easier to test and debug during the smaller iteration.
- The working software generates quickly and early during the software life cycle.
- The customers can respond to its functionalities after every increment.

Incremental Process model

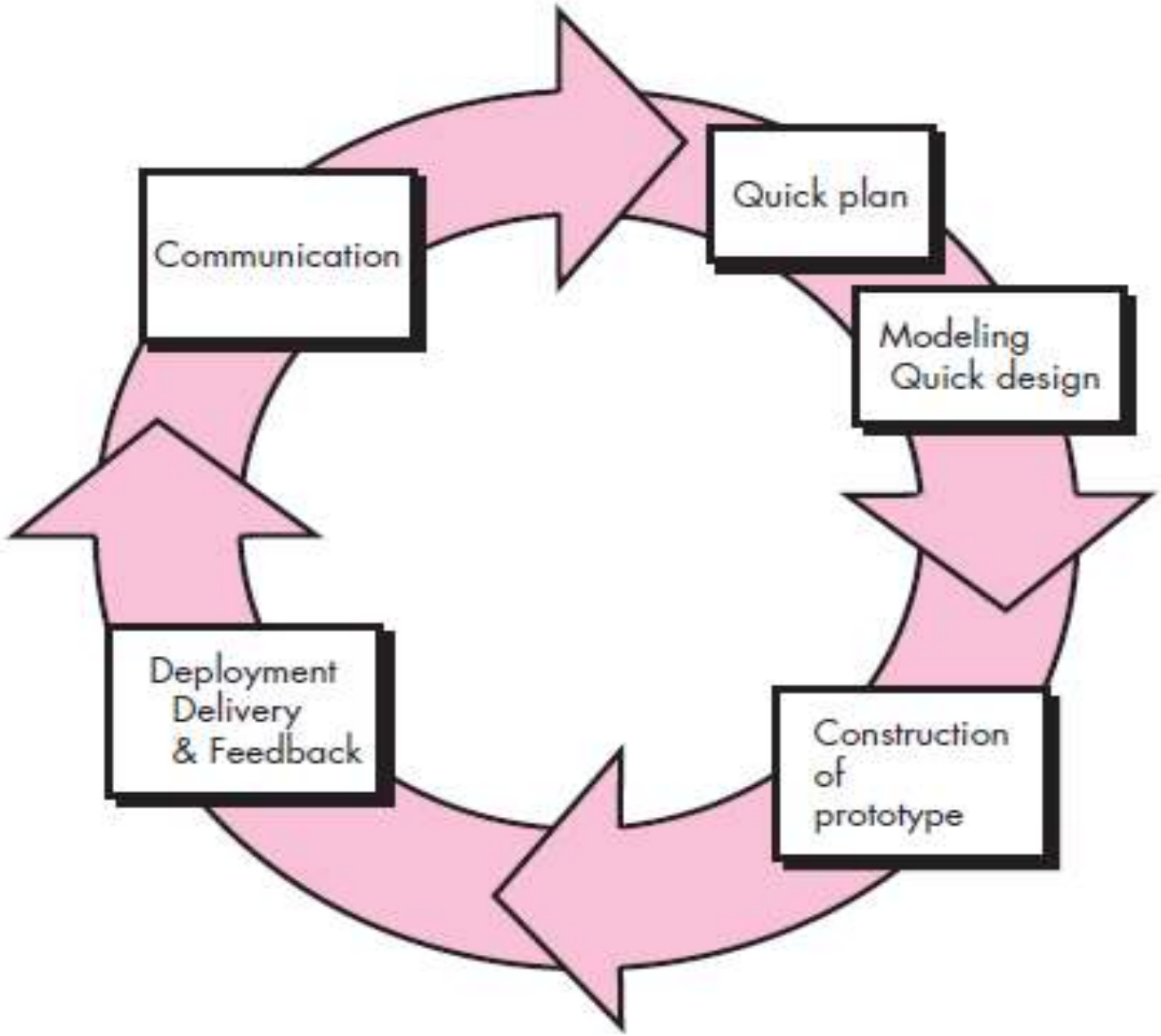
Disadvantages :

- Need clear planning and design
- The planning of design is required before the whole system is broken into small increments.
- Total cost is higher than water fall model

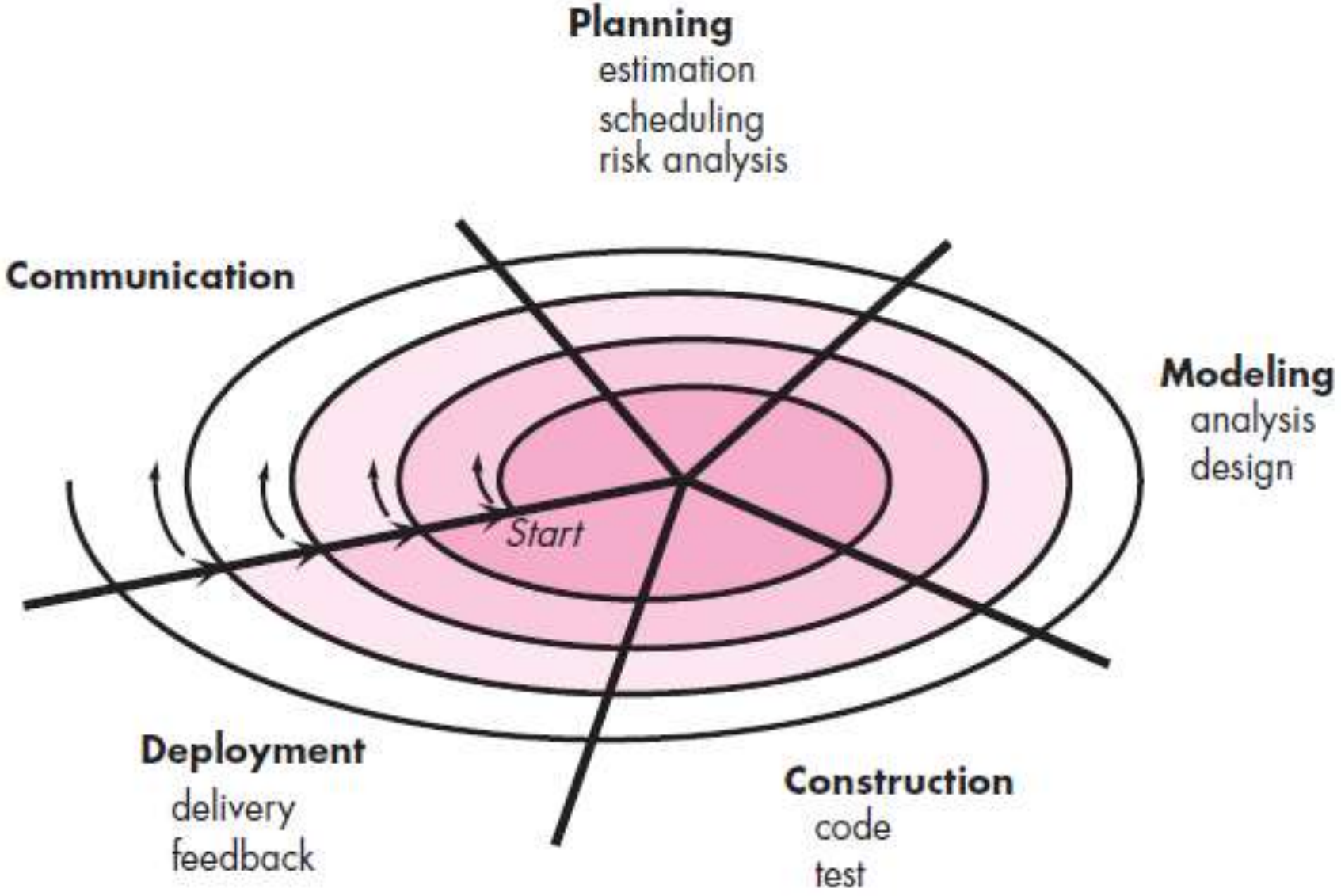
Evolutionary Process Models

- Evolutionary models are iterative. They are characterized in a manner that enables you to develop increasingly more complete versions of the software.
- Evolutionary process models :
    1. **Prototyping**
    2. **The Spiral Model**

Prototyping



The Spiral Model



The Spiral Model

- Proposed by Barry Boehm [Boe88].
- It is an evolutionary software process model that couples the iterative nature of prototyping with the controlled and systematic aspects of the waterfall model.
- risk-driven process model
- cyclic approach
- anchor point milestones

RAD model

Rapid Application Development

- Using the RAD model, software product is developed in a short period of time.
- The initial activity starts with the communication between customer and developer.
- Planning depends upon the initial requirements and then the requirements are divided into groups model
- It is a **high speed** adaptation of the **linear sequential model** in which rapid development is achieved by using **component based construction**

Core Elements of RAD

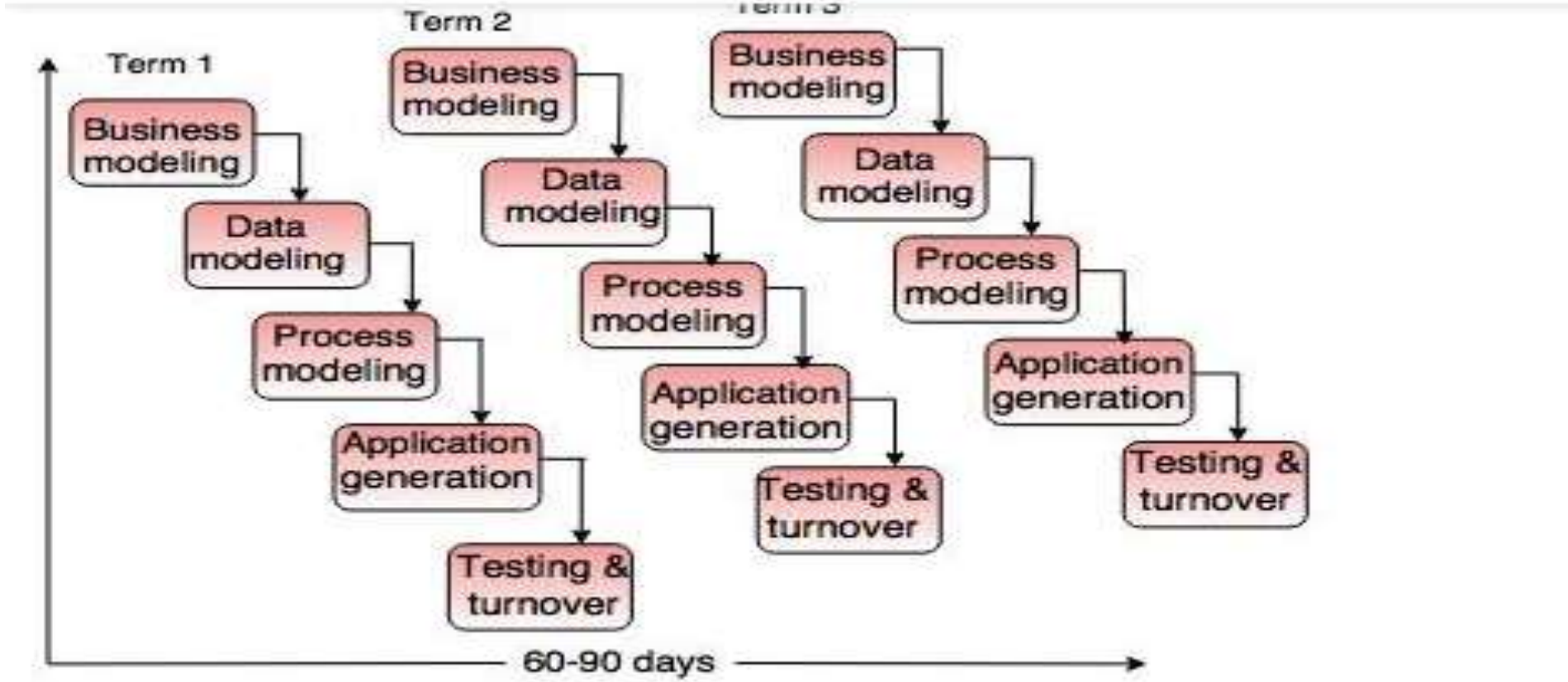


Fig. - RAD Model


Thank You!