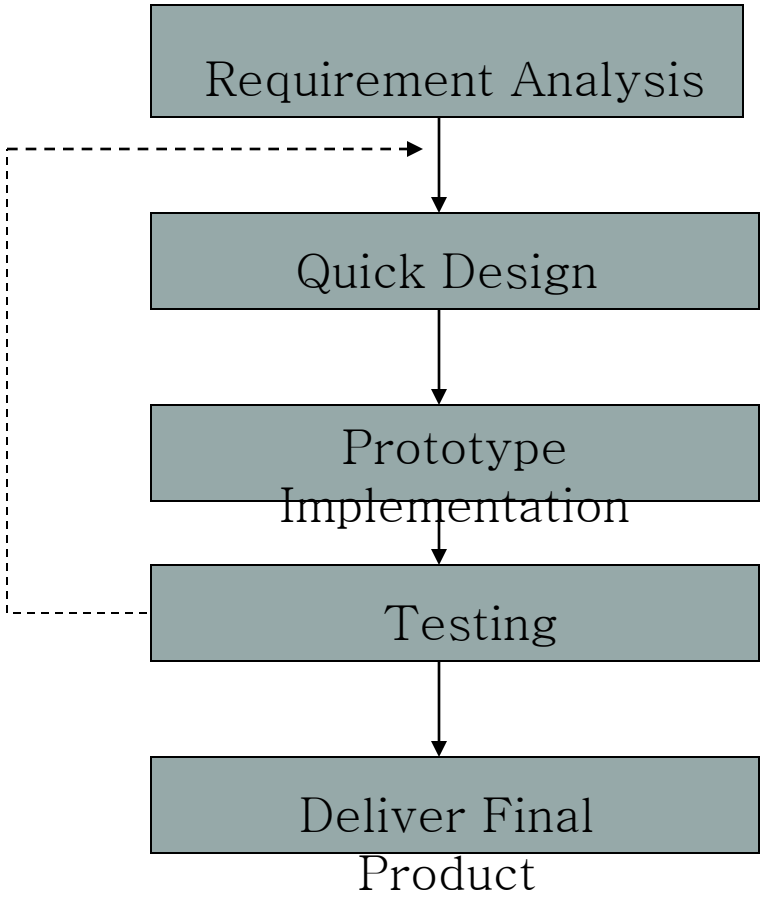
# LECTURE-4

**Dronacharya College of Engineering**

# Prototyping Model

- In this model the developer and client interact to established the requirements of the software.
- Define the broad set of objectives.
- This is follow up by the quick design, in which the visible elements of the software, the input and the output are designed.
- The quick design stresses the clients view of the software .
- The final product of the design is a prototype.
- The client the evaluates the prototype and provides its recommendations and suggestion to the analyst.
- The process continues in an iterative manner until the all the user requirements are met.

# Phases of Prototyping Model



# Advantages of Prototyping Model

**The following are the advantages of Prototyping model**:

- Due the interaction between the client and developer right from the beginning , the objectives and requirements of the software is well established.
- Suitable for the projects when client has not clear idea about his requirements.
- The client can provide its input during development of the prototype.
- The prototype serves as an aid for the development of the final product.

# Disadvantages of Prototyping Model

**The prototyping model has the following disadvantages.**

- The quality of the software development is compromised in the rush to present a working version of the software to the client.

- The client look at the working version of the product at the outset and expect the final version of the product to be deliver immediately. This cause additional pressure over the developers to adopt shortcut in order to meet the final product deadline.

- It becomes difficult for the developer to convince the client as why the prototype has to be discarded.

# Rapid Application Development:

- RAD is a high speed version of linear sequential model. It is characterized by a very short development life cycle, in which the objective is to accelerate the development.
- The RAD model follows a component based approach.
- In this approach individual components developed by different people are assembled to develop a large software system.

# Phases of Rapid Application Development:

The RAD model consist of the following phases.

- Business Modeling:

  In this phase, define the flow of information within the organization, so that it covers all the functions. This helps in clearly understand the nature, type ,source and process of information.

- Data Modeling:

  In this phase, convert the component of the information flow into a set of data objects. Each object is referred as an *Entity.*

# Phases of Rapid Application Development:

- Process Modeling:

  In this phase, the data objects defined in the previous phase are used to depict the flow of information . In addition adding , deleting, modifying and retrieving the data objects are included in process modeling.

- Application Designing:

  In this phase, the generation of the application and coding take place. Using fourth generation programming languages or 4 GL tool is the preferred choice for the software developers.

- Testing:

  In this phase, test the new program components.

# Advantages of Using RAD Model:

**The RAD has following advantages:**

- Due to emphasis on rapid development , it results in the delivery of fully functional project in short time period.
- It encourages the development of program component reusable.

# Disadvantages of Using RAD Model:

**The RAD model has following disadvantages :**

- It requires dedication and commitment on the part of the developers as well as the client to meet the deadline. If either party is indifferent in needs of other, the project will run into serious problem.
- Its application area is restricted to system that are modular and reusable in nature.
- It is not suitable for the applications that have a high degree of technical risk.
- It is not suitable for the large projects because they require more manpower for creating multiple RAD groups.

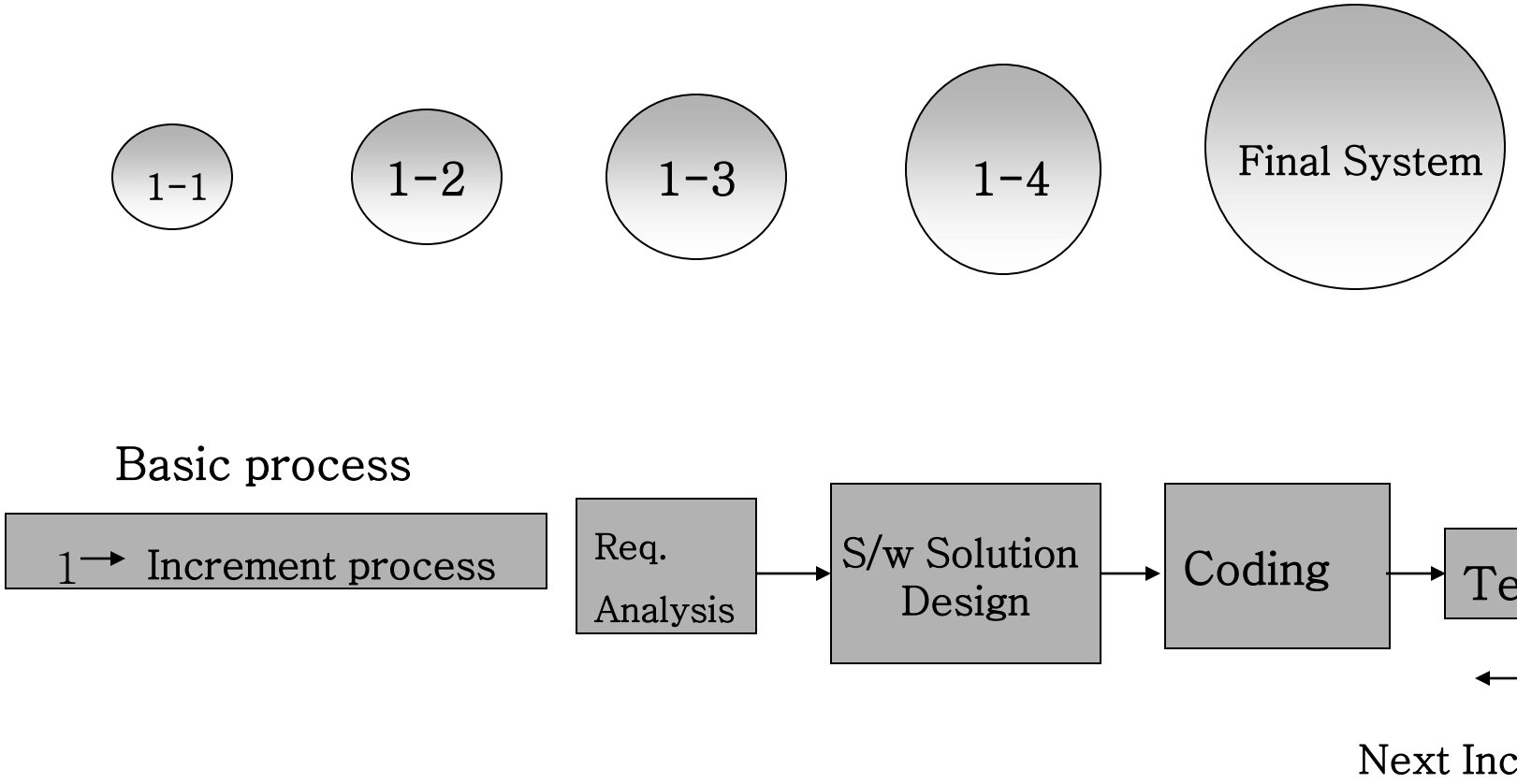
# Incremental Model (INM)

- The incremental model is the combination of the features of linear sequential model and the iterative approach of the prototyping model.
- The software is developed and delivered in small increments and the linear sequential model is applied to each increment.
- In an incremental model ,the prototyping methodology is applied to each process flow of each increment.
- In the case of the incremental model , the first increment that is delivered is the core product.

# Incremental Model (INM)

- The core product addresses the primary needs of the final product.
- It is evaluated and reviewed by the client.
- At times, it is even used on a test basis. Based on client feed back for the core product developers prepare a plan for the next increment.
- New features and functionality are also taken into consideration.
- The above process is applied to each increment that is delivered.

# Incremental Model (INM)



# Advantages of using the Incremental Model

**This model has following advantages:**

- Compared to RAD, it requires less human resources, especially for the first few increments.
- It guarantees early delivery of the final products each increment leads to the development of the software.
- If any resource staff is unavailable , it does not affect or delay the project.
- The incremental model is therefore ideal for those projects in which sufficient manpower is not available to meet difficult project dealines.

# Disadvantages of Using Incremental Model

- Similar to the software prototyping model , software quality is sometimes compromised in the rush to finish the software earlier than planned.

# The Spiral Model

- The spiral model developed by Boehm combines the philosophy of INM,RAD and LSM models with the use of prototyping.

- The spiral model is recommended where the requirements and solution call for developing full-fledge , large, complicated system with lots of features and facilities from the scratch.

- It is used when experimenting on technology , trying out new skills and when the user is not able to offer requirements in clear terms.

- It emphasis at the quick development of the software, which is released in increments.

# The Spiral Model

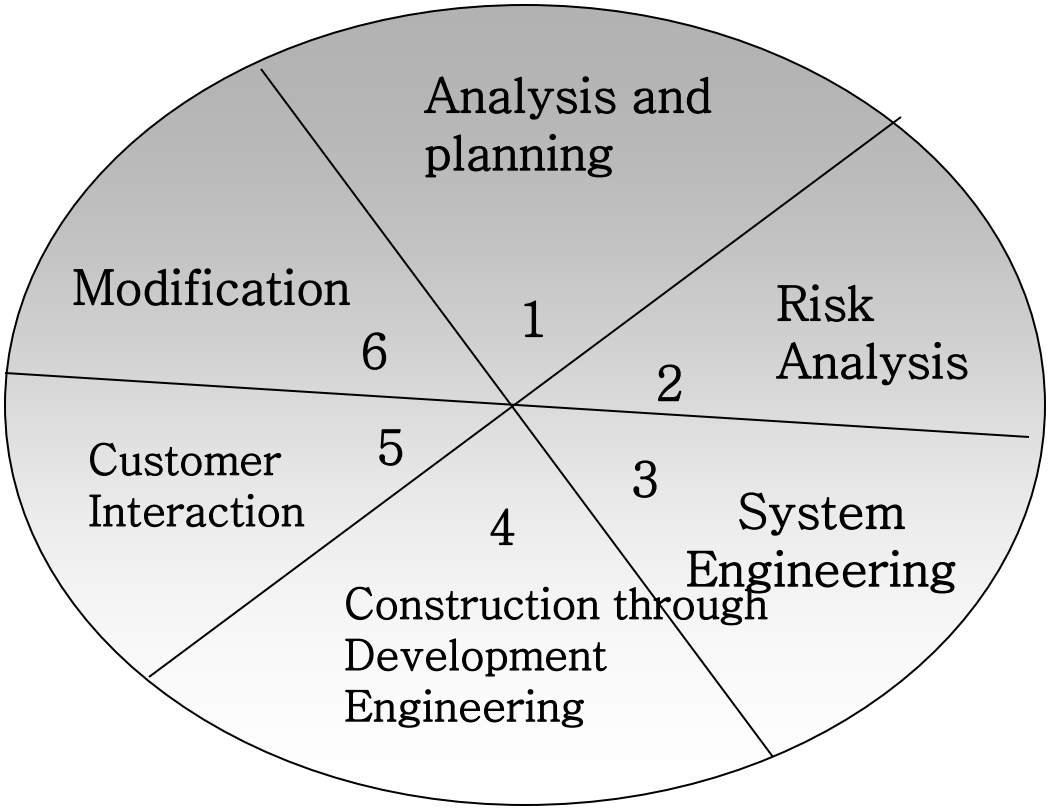
This model consists of a number of activities called task regions.

The number of task regions varies from three to six.

A spiral model consist of the following task regions.

- Communication
- Planning
- Risk analysis
- Engineering
- Construction and release
- Evaluation

# The Spiral Model



# Advantages of Using Spiral Model

**The spiral model has the following advantages :**

- This model is more in tune with large real-life project development.
- Prototyping can be applied at any level in evaluation process.
- This helps to reduce technical risk.
- It is suitable for application that can be use an object oriented approach to develop software.

# Disadvantages of Using Spiral Model

**The spiral model has the following disadvantages:**

- It can cause problems in negotiating a development contract with the client.
- It requires considerable experience in risk management for the project to be successful.
- It requires a lot of patience and time in years before this model's effectiveness can be assessed accurately.