

## Waterfall Model

It's the sequential model. In this model the work is divided into Phases. And the output of one Phase is input the next Phase.

Feasibility study



Requirement analysis & specification



Design



Coding and unit testing



Integration and testing



Maintenance.

- 1) Feasibility Study :- The main focus of the feasibility study stage is to determine whether it would be financially and technically feasible to develop the Software. It involves collection of basic information relating to the software such as the different data items that would be input to the system, the processing required to be carried out on these data, the output required to be produced by the System.

## 2 Requirement analysis and Specification.

The aim of requirement analysis and specification is to understand the exact requirement of the customer and to document them properly. In this phase there are two distinct activities, namely, requirement gathering and analysis, and requirement specification.

- Requirement gathering and analysis

In this the requirements are gathered from customer and then the gathered requirement are analysed.

The goal of the requirements analysis activity is to weed out the incompleteness and inconsistencies in these gathered requirements.

- Requirement specification

After gathering the requirements and analysing them the requirements are documented properly.

This document is called as Software requirements specification (SRS) document. The SRS document normally serves as a contract between the development team and the customer.

Any further dispute between the customer and the developer can be settled by examining the SRS document.

# Design

The goal of the design phase is to transform the requirements specified in the SRS document into a structure that is suitable for implementation in some programming language. In technical terms during the design phase, the Software architecture is derived from the SRS document.

The functional requirements specified in the SRS document are decomposed into subfunctions and the data-flow among these subfunctions is analysed and represented diagrammatically in the form of DFDs.

## Structure Design

High level design

low level design  
data structure

Interfaces

Algorithms

4

## Coding and unit testing.

The purpose of the Coding and unit testing phase is to translate a Software design into Source Code.

Programmers code the diff -

The Coding is not done in a single shot.

The work is divided into modules. After Coding each and every module, they unit their respective modules.

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## Testing and integration.

The different modules are integrated in a planned manner. Integration of various modules are normally carried out in incrementally over a number of steps. Then System testing is carried out on this fully working System.

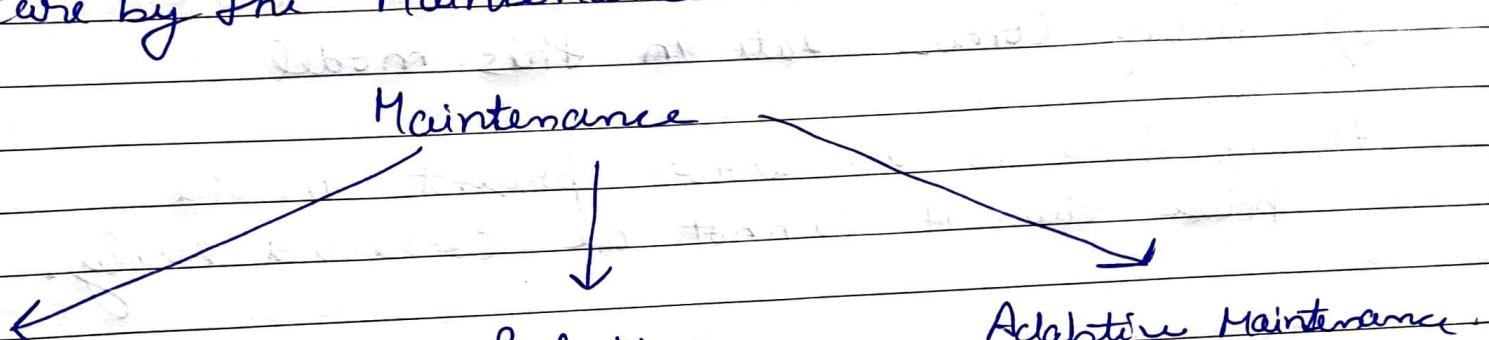
Three types of testing is performed :-

1)  $\alpha$ -testing :- System testing performed by the development team.

2)  $\beta$ -testing :- This is the system testing performed by the friendly set of customers.

3) Acceptance testing :- After the software has been delivered, the customer itself performs system testing to determine whether to accept the delivered software or not.

6 Maintenance :- The time and efforts put in maintenance phase is far greater than the development phase. After the deployment of Software to the customer there might be some bugs or errors present. That is taken care by the Maintenance team.



\* This type of maintenance is carried out to correct errors that were not discovered during development Phase.

\* This type of maintenance is carried out to improve performance of system.

\* This type of maintenance is done to make sure that the software will work in every environment -

## disadvantages

- 1) No feedback Paths.
- 2) Not beneficial ~~for~~ for the projects where requirements keep on changing.
- 3) Testing comes late in this model.
- 4) If there is an error present in the phase then it cannot be corrected easily.

## Iterative Waterfall Model

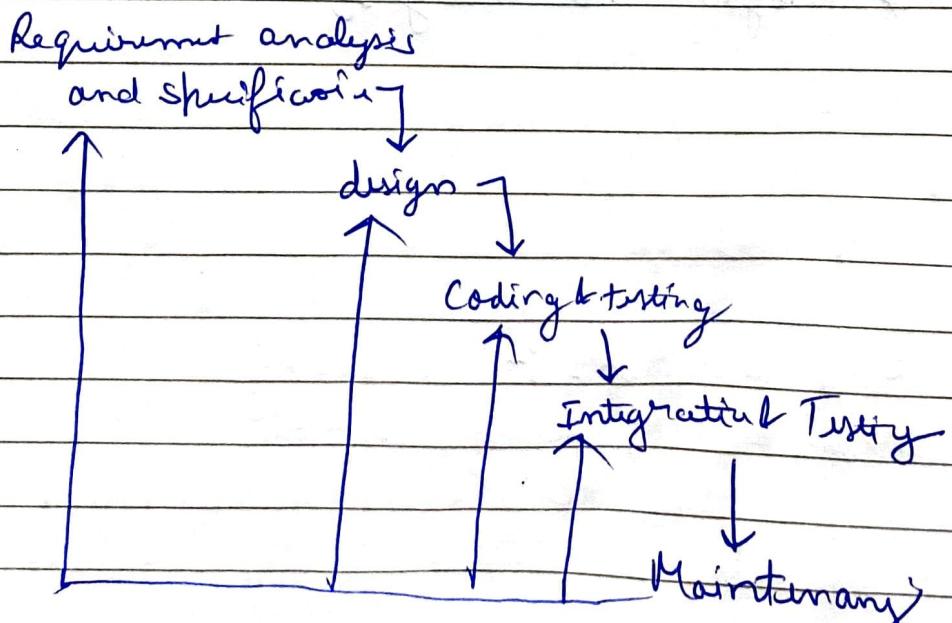
The Classical waterfall model is hard to use because of many disadvantages. Waterfall model is hard to use in practical software development project.

In this context, the iterative waterfall model can be thought of as incorporating the necessary changes to classical waterfall model.

The feedback paths are introduced by the iterative waterfall model. These paths allow for correcting errors committed by a programmer in some phase, as and when they are detected in a later phase.

If an error comes in testing phase then the feedback path allows the programmer to go back in design phase to make some changes and rectify the error and re-modify the document.

Feasibility Study →



Q Why there is no ~~any~~ path for feasibility study?

A:- क्योंकि अपने एक विदेशी वित्तीय संस्थानों द्वारा विकास कराया गया है और उन्हें अपने विदेशी वित्तीय संस्थानों द्वारा विकास कराया गया है - because of some legal and moral reasons.

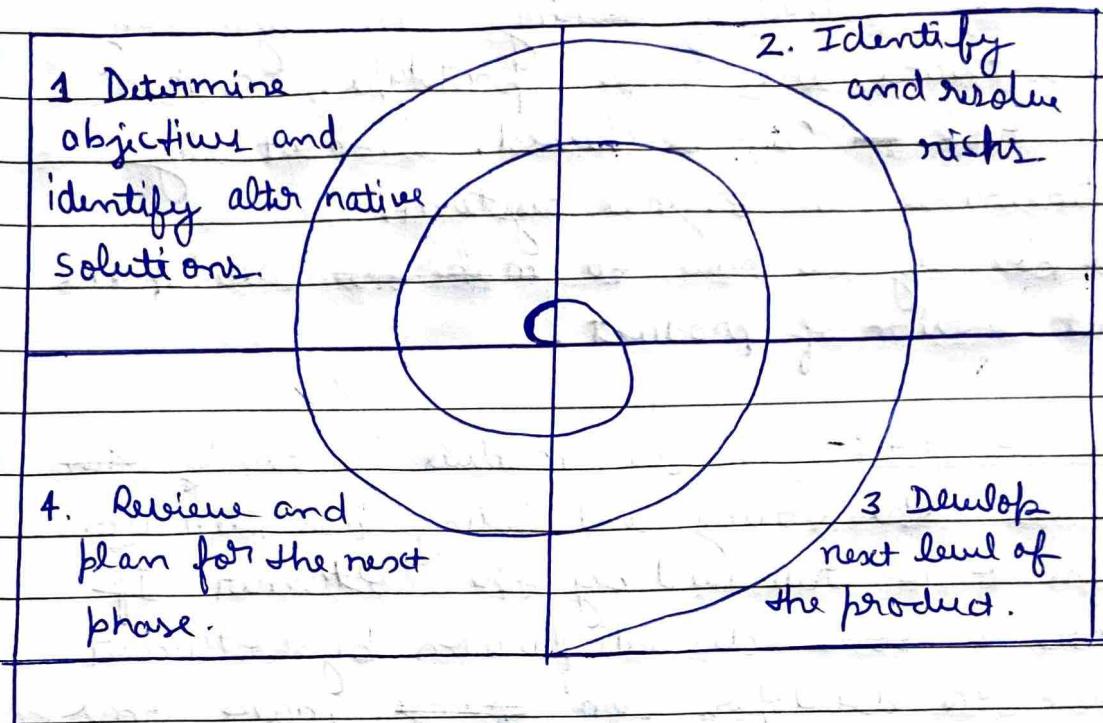
### Advantages

- \* Base model
- \* Simple and Easy
- \* Small projects.
- \* Feedbacks.

### Disadvantages

- \* No phase Overlapping  
:- we cannot work ~~on~~ parallelly on all the phases
- \* No intermediate delivery
- \* Rigid (no changes)

## SPIRAL MODEL



This model gets its name from the appearance of ~~this~~ its diagrammatic representation that looks like a spiral with many loops.

Each loop of the spiral is called a phase of the software process.

The exact number of phases through which the product is developed can be varied by the project manager depending upon the project risks.

Quadrant 1 :- The objectives and requirements of customers are analyzed. Then possible solutions are identified.

Quadrant 2 :- In this we identify the risks which can come in our steps for the development of our software. And how can we resolve those risks.

3) Quadrant 3 :- We follow a different approach here like instead of ~~making~~ directly making the software we make ~~prototype~~ so that the risk ~~s-~~ can be checked without any interference in original system. So basically we have to ~~make~~ ~~the~~ Develop the next version of product.

Quadrant 4 :- If the module is ready then means the Coding and testing has been done. Then it is reviewed by the Customer. If there is some dissatisfaction by Customer then the developer can ~~change~~ make some changes in this quadrant. If the project manager wants some changes or he ~~wants~~ that ph is not satisfied then he can again increase the Quadrants.

### Advantages :-

1) Risk handling

2) Large Projects

3) Flexible

4) Customer Satisfaction

5) Meta Model :- We are using 1 prototype model, Waterfall model, Iterative model collectively so it is known as Meta model.

### Disadvantages :-

1) Complex

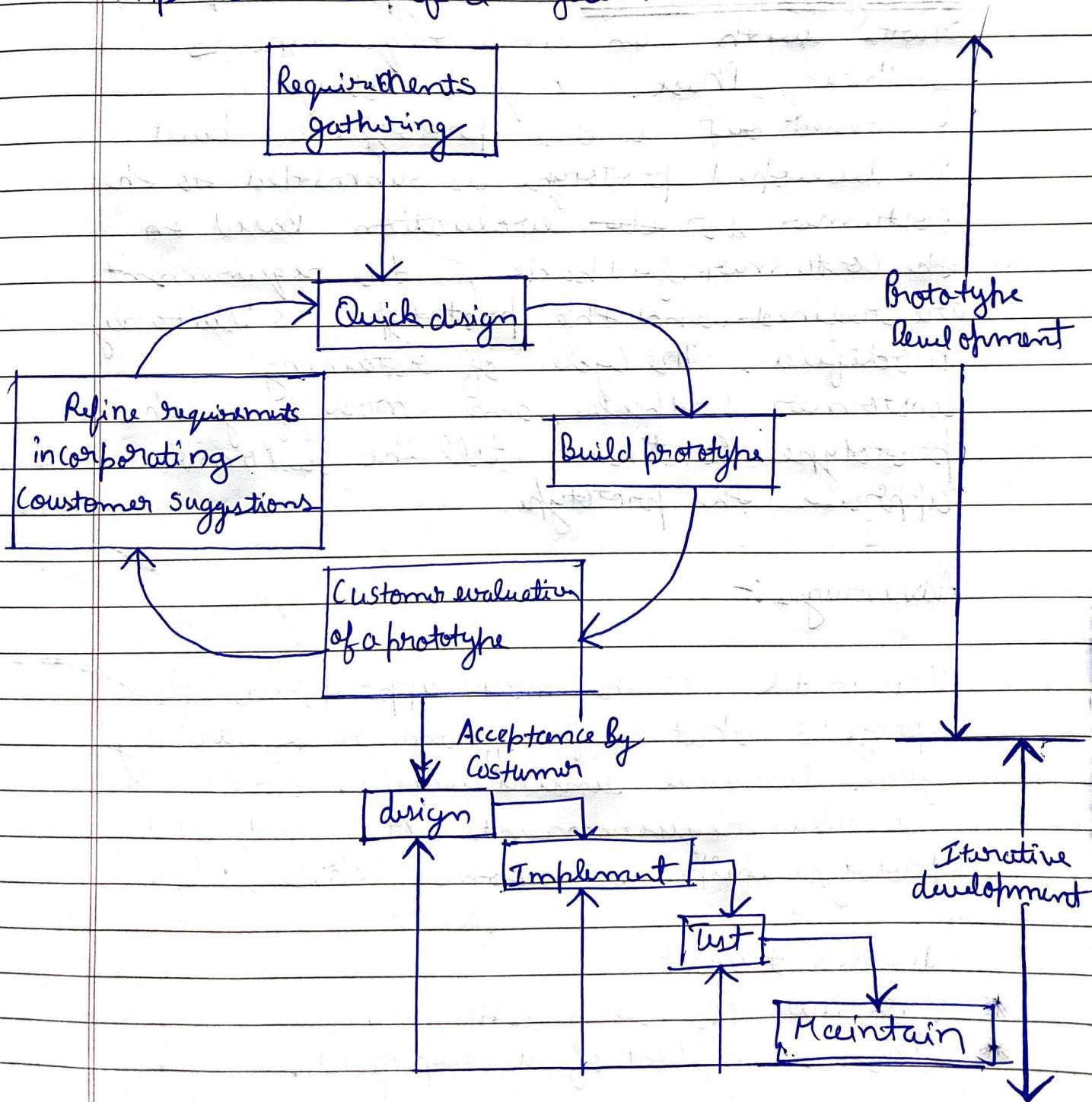
2) Expensive

3) Too much risk analysis

4) Time

## Prototyping Model

The prototype model is also a popular life cycle model. The prototyping model can be considered to be an extension of the waterfall model. This model suggests building a working prototype of the system, before development of the actual software. A prototype is a toy and crude implementation of a system.



The basic idea of this model is that before building the system, the actual steps of building the system. A Prototype should be built and it should have acceptance by the customer if the customer satisfied them the steps of Iterative development method is followed.

Prototype development:- Prototype development starts with an initial requirements gathering phase. A quick design is carried out and a prototype is built. The developed prototype is submitted to the customer for evaluation. Based on the customer feedback, the requirements are refined and the prototype is suitably modified. The cycle of obtaining customer feedback and modifying the prototype continues till the customer approves the prototype.

Advantages :-

This model is the most appropriate for projects that suffer from risk arising from technical uncertainties and unclear requirements. A constructed prototype helps overcome these risks.

disadvantages :-

- \* Customer Not clear with idea,
- \* Increase in Cost of development.