

# Systems Analysis and Design

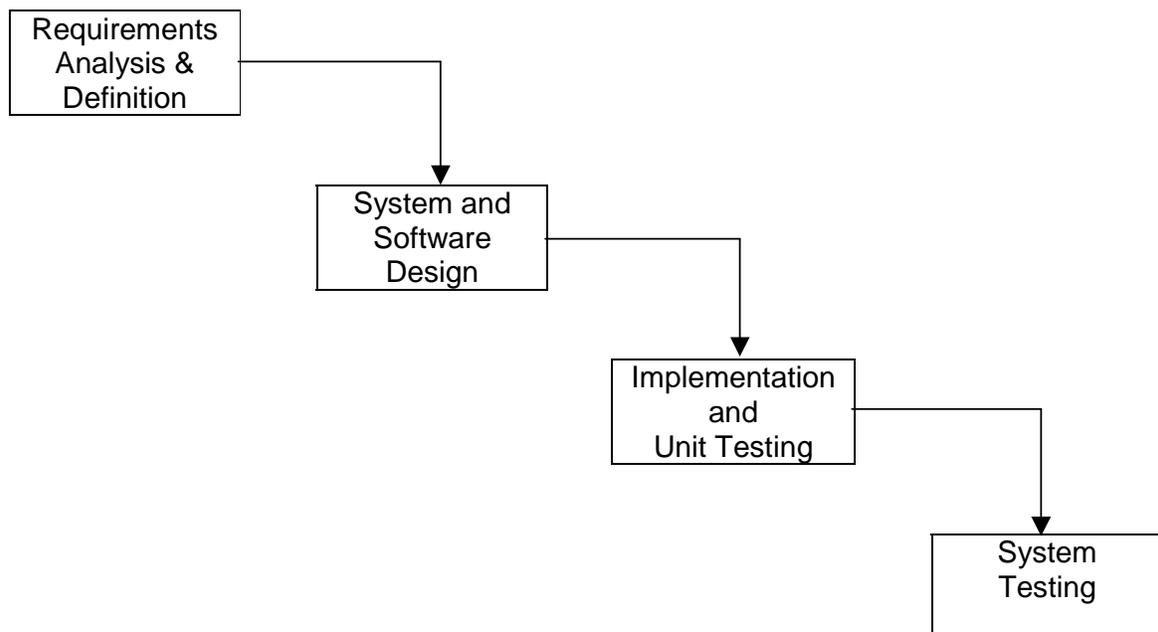
## 12 Life Cycle Models

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Every systems life cycle model has three stages: definition, development, and maintenance.

### 12.1 Waterfall Model

The waterfall model is very similar to the traditional model described in Chapter 2 Lifecycles.



At the end of each stage we ask:

- are we building the product right according to specification?
- are we building the right product according to client needs?

### Advantages

1. each stage is signed off as finished when it is completed
2. each stage has a deliverable
3. progress made is easy to measure
4. project is easy to manage
5. good chance of project being delivered on time and to budget

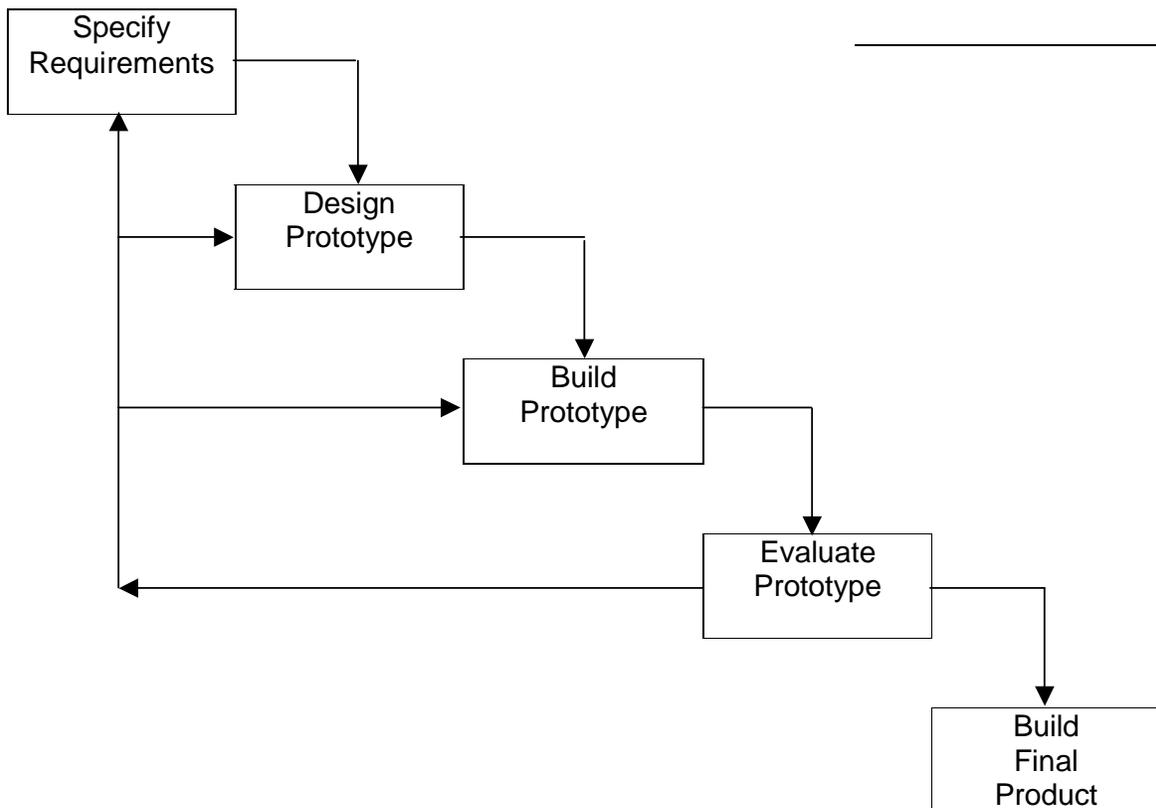
### Disadvantages

1. if an error is found at the end of a stage then you have to go back and correct it. This can cause delays.
2. errors can slip through un-noticed because of the pressure to achieve milestones and meet interim targets

## 12.2 Prototyping

Prototyping involves:

- building a model to provide the look and feel of what is required
- evaluating the model leading to an improved requirements specification
- building the final product based on experience gained



**Advantages**

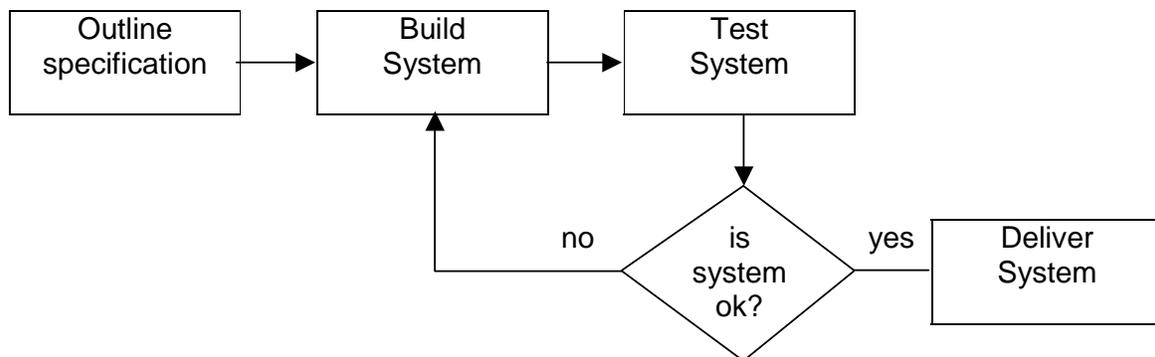
1. users often do not know what they want until they see what they do not want
2. iterative development leads to improved requirements specification
3. lessons learned inform final version

**Disadvantages**

1. user may not readily give up the prototype along with its incomplete features and lack of validation
2. nightmare project control - no knowing when a stage will be completed
3. too easy to run over time and over budget
4. managers may not see the sense of throwing away the prototype to build the final version

### 12.3 The Exploratory Programming Model

Students often use the exploratory programming model.



They receive the specification from the lecturer.

They build the program and test it.

If they think it is ok they hand it in.

If they think it is not ok they improve the program, and test it again.

### Advantages

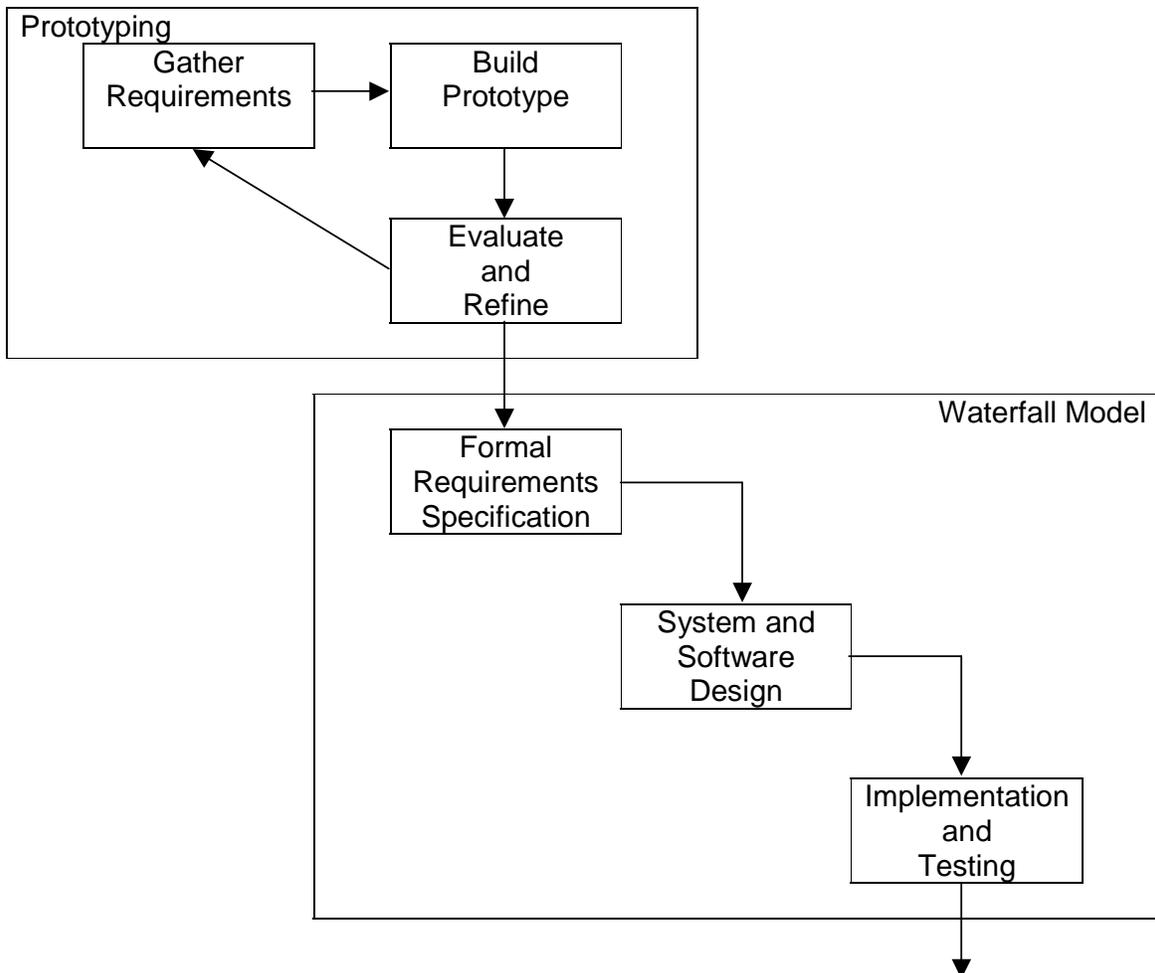
1. good for when you need to experiment to see what works best
2. loved by programmers who hate discipline and control

### Disadvantages

1. specification not developed and refined
2. lack of documentation makes maintenance difficult
3. could lead to unstructured mess
4. lack of project management means project likely to run over time and over budget

## 12.4 Hybrid Model

One hybrid model uses prototyping coupled with the classic waterfall model.



**Advantages**

1. specification refined and developed leading to fewer errors
2. possibility of good project control with the correct product being delivered on time and on budget
3. could be well documented making maintenance easier
4. eventual disposal of prototype formally planned

**Disadvantages**

1. errors found in the waterfall stage could lead to project over-run

**Bibliography**

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