CS- 3108

Assignment

Date – 23.6.2019

Roll Number : 3-CS-5

Waterfall Model

- The first published model of the software development process.
- Derived from more general system engineering process.
- A breakdown of the project activities into linear sequential phases.
- Each phase depends on the deliverables of the previous one.

Principle stages of the Waterfall Model

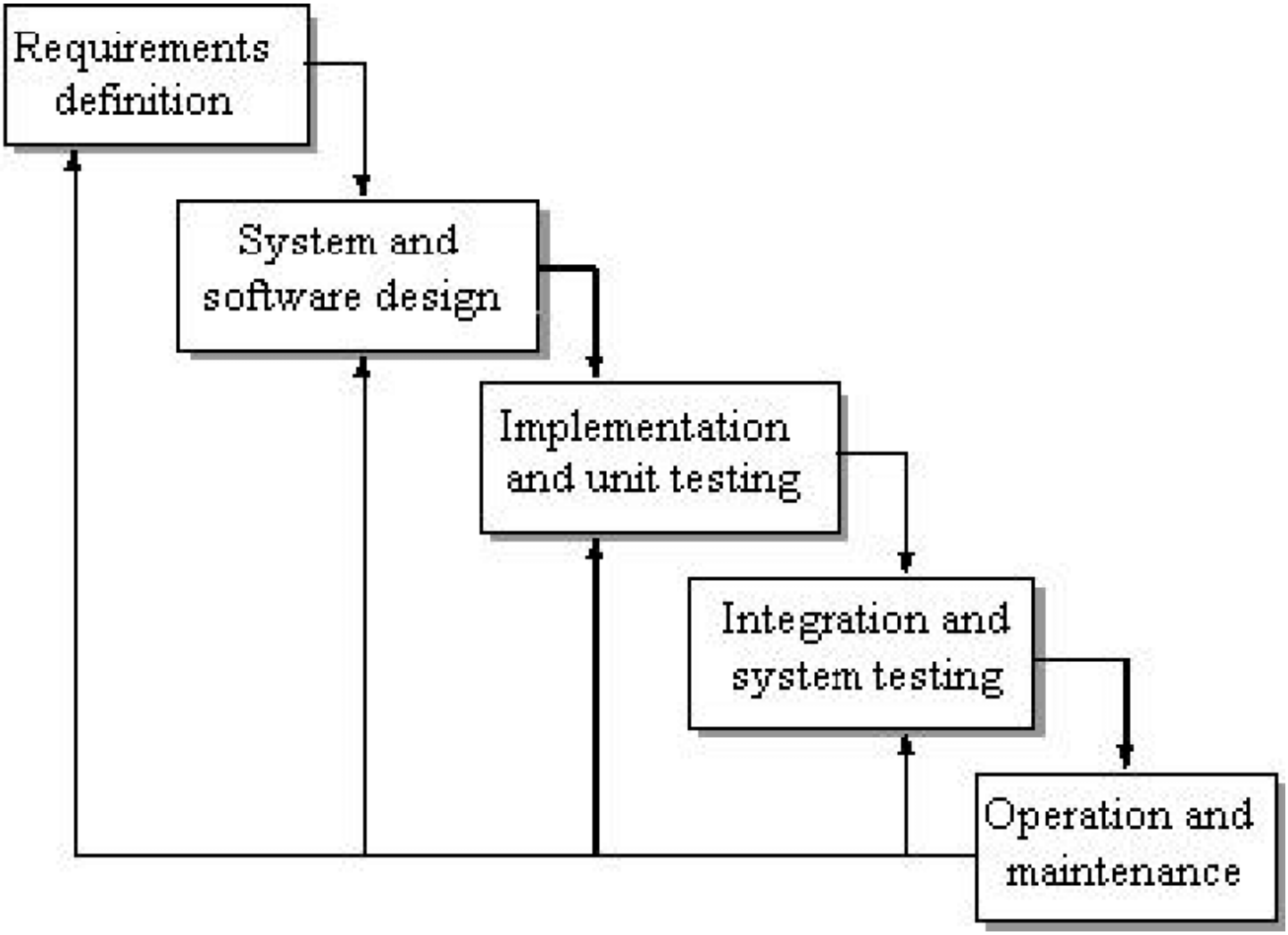
1. **Requirement analysis and definition** – The System's services, goals and constraints are established.

2. **System and software design** – Establishes an overall system architecture.

3. **Implementation and unit testing** – software design is realised as a set of program or program units. Unit testing is verifying phases meets its specifications.

4. **Integration and system testing** – Program units or programs are integrated and tested as a complete system with its specifications.

5. **Operation and Maintenance** – Involves correcting errors, improving implementations.



Waterfall Model

When to use the waterfall model

- Requirements are very well known and clear
- There are no ambiguous requirements
- Technology is understood.
- Rresources required are available freely
- The project is short.

Advantages of waterfall model

- Simple and easy to understand and use.
- Easy to manage
- Works well for smaller projects

Disadvantages of waterfall model

- it is very difficult to go back and change something
- High amounts of risk
- Not a good model for object-oriented projects.

Evolutionary Model

- A combination of Iterative and Incremental model of SDLC.
- Based on idea of developing initial software then expose to user and get feedback and comments from user and refine through many versions until the final version is committed.

Two fundamental types of Evolutionary Model

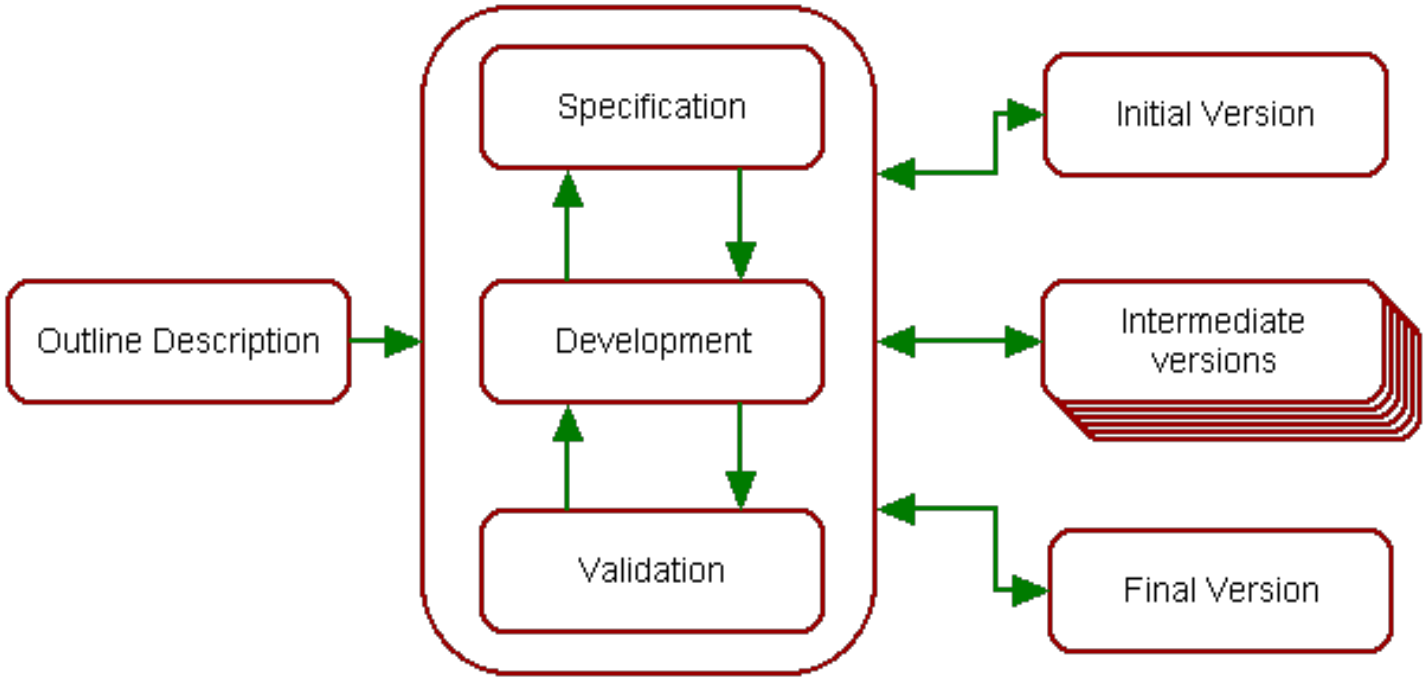
1. **Exploratory Development –** works with customers to explore requirements and deliver final version.

2. **Throwaway Prototyping –** understand customer's requirements and develop better requirements for the system. The prototype is to explore more requirements from the customer.

Evolutionary approach has two problems

1. **The process is not visible –** It's costly to produce documents for every single versions

2. **Systems are often poorly structured –** Continous Changes causes the system structure corruption.



Evolutionary Model

Advantages

- A user gets a chance to experiment partially developed system.
- It reduces the error because the core modules get tested thoroughly.

Disadvantages

- The process is not visible
- Systems are often poorly structured

Component-based Software Engineering (CBSE)

- There is some software reuse in software projects.
- If project team members know the design and code similar to current project, they look for these and modify as needed.
- Reuse is often essential for rapid system development.

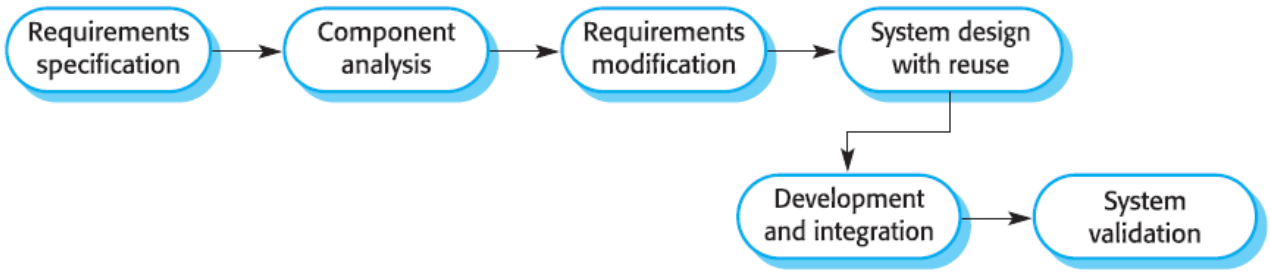
Intermediate stages in CBSE

1. **Component Analysis** – Search component match with requirements but there is no exact componet as requirements, provide only functionality required.

2. **Requirement Modification** – Requirements are anlysed using information of component found.

3. **System Design with reuse** – The framework of the software is defined or reuse the existing framework.

4. **Development and integration** – Systems and components are integrated to create the new system.



Component-based Software Engineering

Advantages

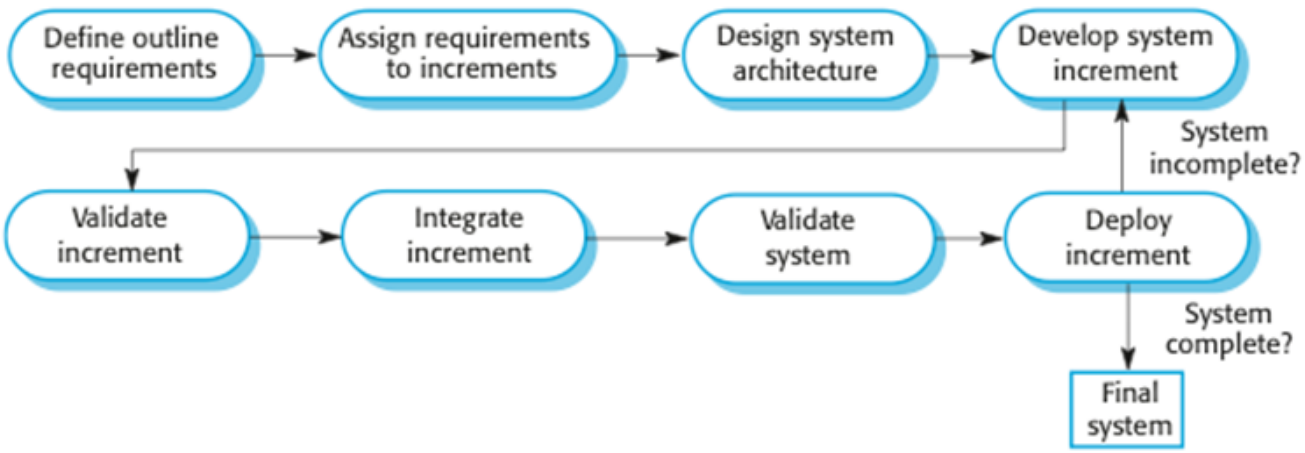
- Reduces the amount of time to be developed
- Reduces risk
- Faster Delivery

Disadvantages

- Testing is harder due to reuse
- High initial cost

Incremental Development

- Small version with some main feautres is implemented first.
- Another versions are implemented to meet the specifications and requirements of the user.



Advamtages

- Customers do not need to wait until the end of the project to gain value.

- Customers can use early increments as prototypes
- There is lower risks for project failure

Disadvantages

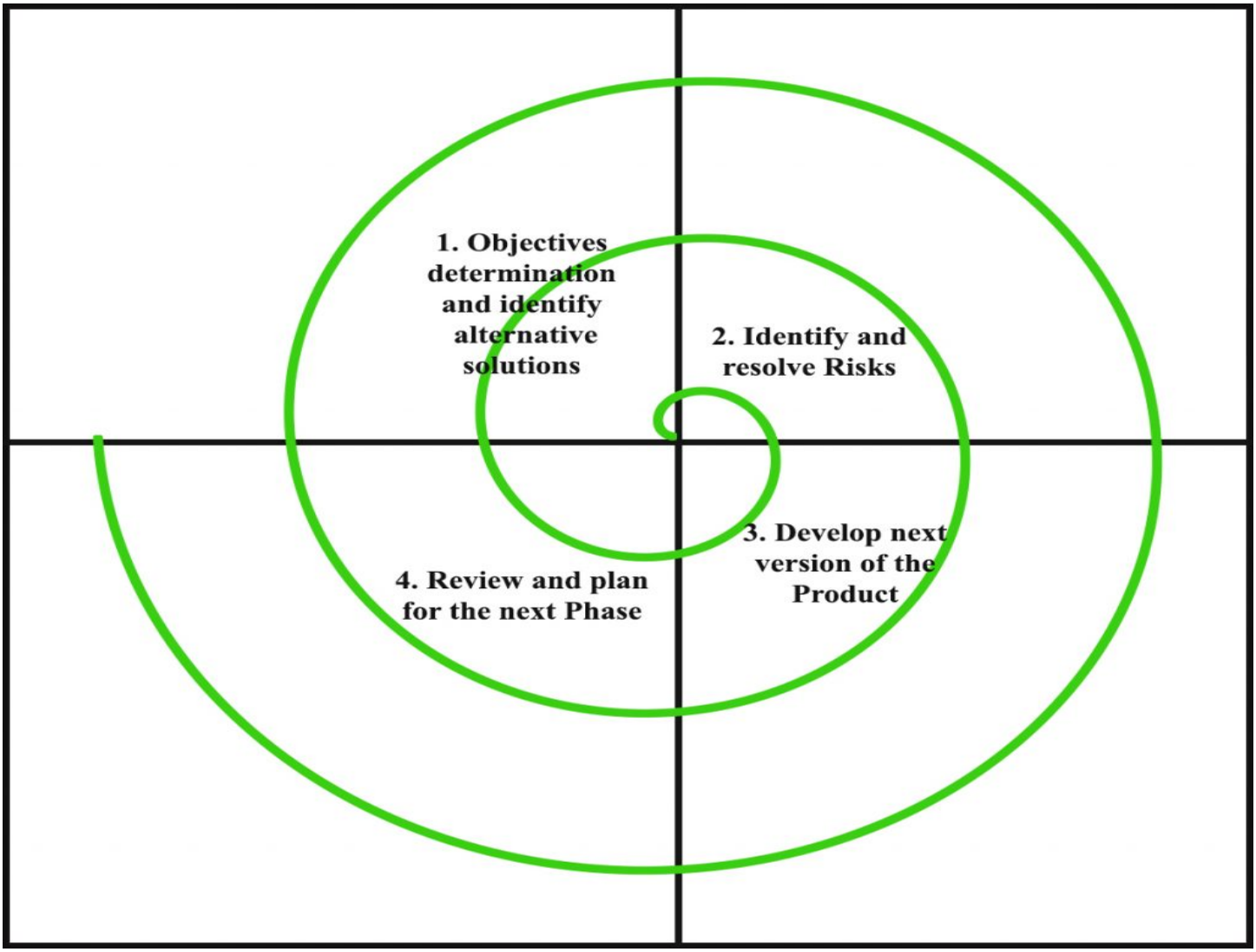
- Need perfect plan and design
- Need a clear requirement of the whole system at the start of the project.
- Cost is sometimes higher than Waterfall Model.

Spiral Development Model

- Represents as a process of activities with some backtracking.
- Each loop in the spiral represents a phase of the software process.

Four Sectors in each loop

1. **Objective Setting** – Specific objectives for the phase of the project are defined.
2. **Risk assesment and reduction** – Risk detailed is analysed. Steps are taken to reduce the risk.
3. **Devvelopment and validation** – After risk evaulation, a development model is chosen.
4. **Planning** – Project is reviewed and decision made to continue a further loop



Advantages

- Good for large projects
- Flexibility in Requirements
- Customer Satisfaction

Disadvantages

- Complex
- Expensive
- Difficulty in time management