What is software Engineering?

- Specification
- Design
- Implement
- Verify
- Deploy
- Maintain

Software Engineering

" People working together to create a robust software system that satisfies the client. "

Robust = Strong

Challenges

Technical

Interpersonal

Key characteristics of a good software system

Functionality | Reliability | Usability | Performance

Scalability | Security | Maintainability | Portability

Results of bad software practices

Failed Projects

Lost Money

Stressed Employees

Poor Customer Value

Reasons for Software Project failures

- ◇ Unrealistic project goals
- ◇ Inaccurate estimates of needed resources
- ◇ Badly defined system requirements
- ◇ Unmanaged risks
- ◇ Poor communication
- ◇ Poor project management
- ◇ Stakeholder pressure

Low Expectations

Increased Demands

Results of good software practices

Successful Projects

Happy Customers

Business Value

Lower Stress Levels

Software Development Process

Software Specification

Software Design And Implementation

Software Validation

Software Evolution

Accountability

Timeliness

Observability

Efficiency

Software Process Models

Software Development Models

Waterfall

V-Shaped

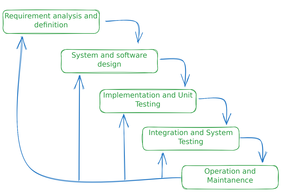
RAD

Prototype

Iterative & incremental

Agile

Waterfall Model



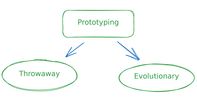
Advantages of Waterfall Model

- Simple and easy to implement.
- Each phase has specific deliverable.
- Documentation is produced at each stage.
- Works well with well defined and smaller projects.
- Minimal resource requirements.

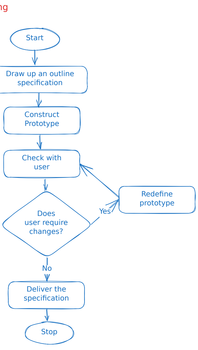
Disadvantages of Waterfall Model

- Difficult to accommodate changes once process is underway.
- Inflexible due to distinct phase partitioning
- Cannot get working software model until the final stage.
- High amount of risk and uncertainty.

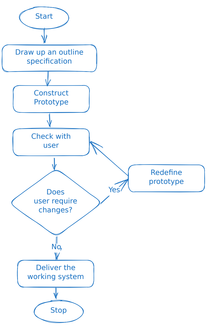
Prototyping



Throwaway Prototyping



Evolutionary Prototyping



Advantages of Prototyping

- Improved communication.
- Reduced risk and uncertainty.
- Flexible and responsive to the changes.
- Early user feedbacks.
- Faster development.

Disadvantages of Prototyping

- Incomplete system.
- Time and resource intensive.
- Difficulty in scaling.
- Abandoned prototypes.