Practical No. 1

Aim: Write a practical to list down all SDLC Models.

1. Write in brief about each model (along with diagram).
2. Analyze in which environment, which model is most suitable.
3. Identify which model will be used in your project and justify the same.

Analysis of SDLC Models

The following SDLC models are covered: Waterfall, Incremental, Spiral, Prototype, Rapid Application Development (RAD), and Agile.

1. Waterfall Model

Waterfall model is a SDLC model that follow linear and sequential approach. Once a phase is completed, it cannot be modified or backtracked, hence the name "Waterfall".

It has the following phases:

1. Requirement Analysis
2. Design
3. Development
4. Testing
5. Deployment
6. Maintenance

Advantages

1. Simple and easy to understand
2. Clear and well-defined phases
3. Easy to manage
4. Easy to control

Disadvantages

1. Not suitable for projects where requirements are not well defined
2. Not suitable for projects where requirements are changing
3. Not suitable for projects where requirements are not stable

Best Suitable for Projects

1. Projects where requirements are well defined
2. Projects where requirements are stable
3. Projects where requirements are not changing

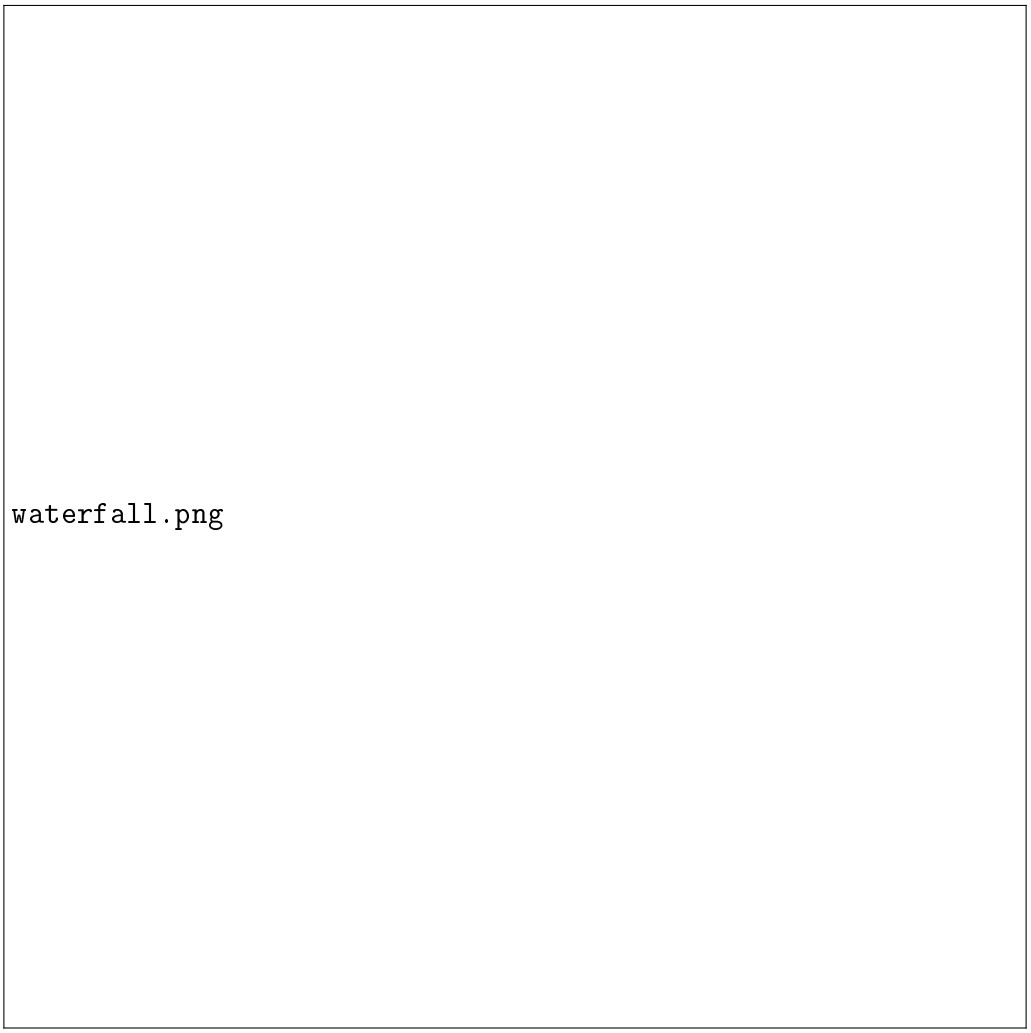

Figure 1: Waterfall Model

2. Incremental Model

Incremental model is a SDLC model that follow incremental approach. It is a combination of Waterfall and Spiral model. In this model phase can be repeated multiple times. It divides the project into small modules and develop them one by one. It is best suitable for projects where requirements are changing.

It has the following phases:

1. Requirement Analysis
2. Design
3. Development
4. Testing

5. Deployment
6. Maintenance

Advantages

1. Simple and easy to understand
2. Clear and well-defined phases
3. Easy to manage
4. Easy to control

Disadvantages

1. Not suitable for projects where requirements are not well defined
2. Not suitable for projects where requirements are changing
3. Not suitable for projects where requirements are not stable

Best Suitable for Projects

1. Projects where requirements are well defined
2. Projects where requirements are changing
3. Project needs to be Delivered quickly.
4. Project can have major update later.
5. Developement Team is Small.

3. Spiral Model

A Spiral model is a SDLC model that follow incremental approach. In this model phase can be repeated multiple times. It is best suitable for projects where requirements are changing.

It has following phases:

1. Planning
2. Risk Analysis
3. Engineering
4. Evaluation

Advantages

1. Efficient risk management
2. Early identification of potential issues
3. Better resource allocation
4. Improved project planning

Figure 2: Incremental Model

Disadvantages

1. High cost
2. High time
3. High complexity
4. High risk

Best Suitable for Projects

1. For large-scale and mission-critical projects.
2. When requirements are unclear or expected to evolve significantly.
3. When risk and cost evaluation is critical to success.
4. When frequent releases or continuous feedback is required.

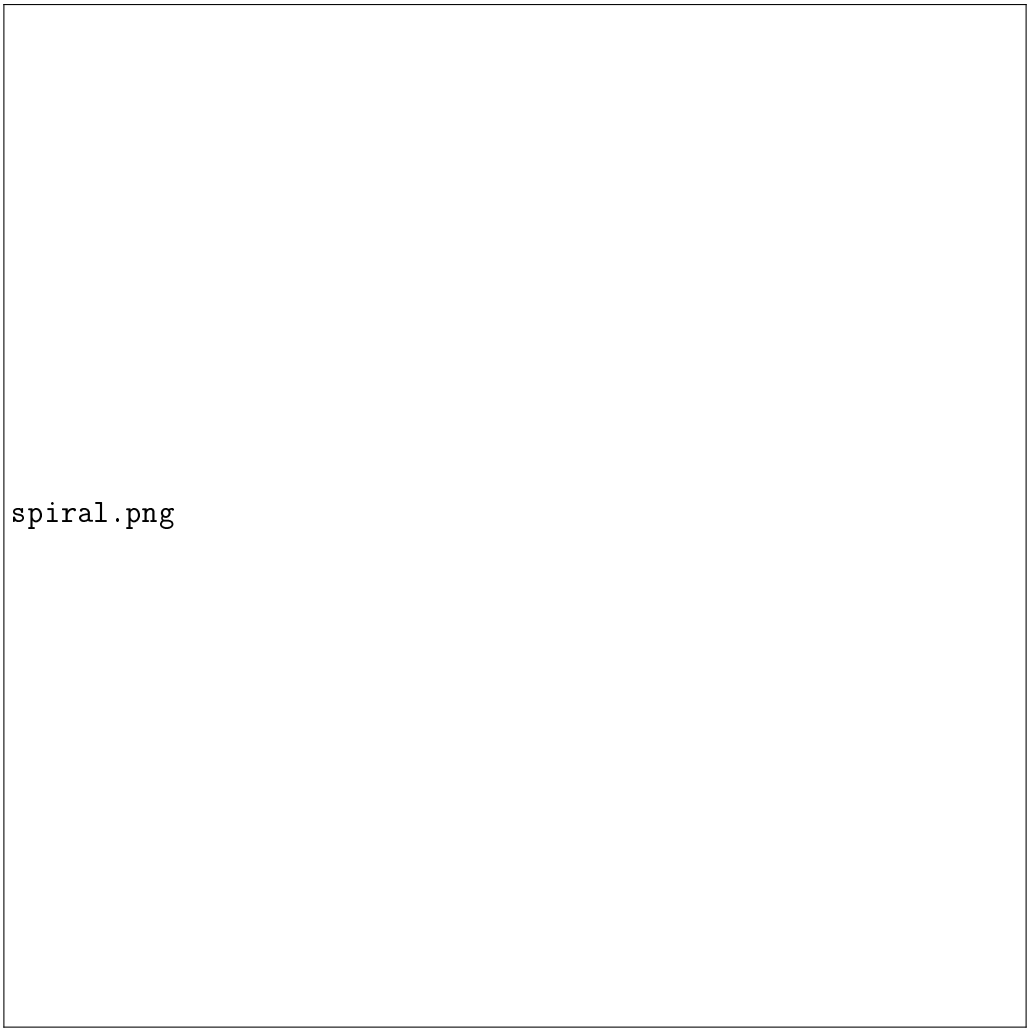

Figure 3: Spiral Model

4. Prototype Model

A Prototype model is a iterative SDLC model. In this model a priliminary version of the product is created before fullscale developement. This model is particularly Effective when product is user centric and end-users are involved in the development process.

Advantages

1. Continuous feedback ensures the product meets actual user needs.
2. Early identification of potential issues
3. Easily accomodates changes and updates
4. Validates Technical Feasibility before full development

Disadvantages

1. Multiple iteration cycles can extend timelines and increase upfront costs.
2. Scope of project may exceed original requirements.
3. CLient may mistake prototype for final product.
4. A rushed prototype may not result in poor project architecture and design.

Best Suitable for Projects

1. When product is user centric and end-users are involved in the development process.
2. Where user UX is critical factor
3. Where End-User requirements are ambiguous or changing

5. Rapid Application Development (RAD) Model

Rapid Application Development (RAD) is a SDLC model which is used when multiple teams work on the same project. In this this modal Project is divided into modules and then different teams work on different modules. After Modules are completed then they are merged and tested before final release.

Phases

1. Requirement Gathering
2. User Design
3. Rapid Construction in multiple Teams
4. Testing and Integration
5. Deployment

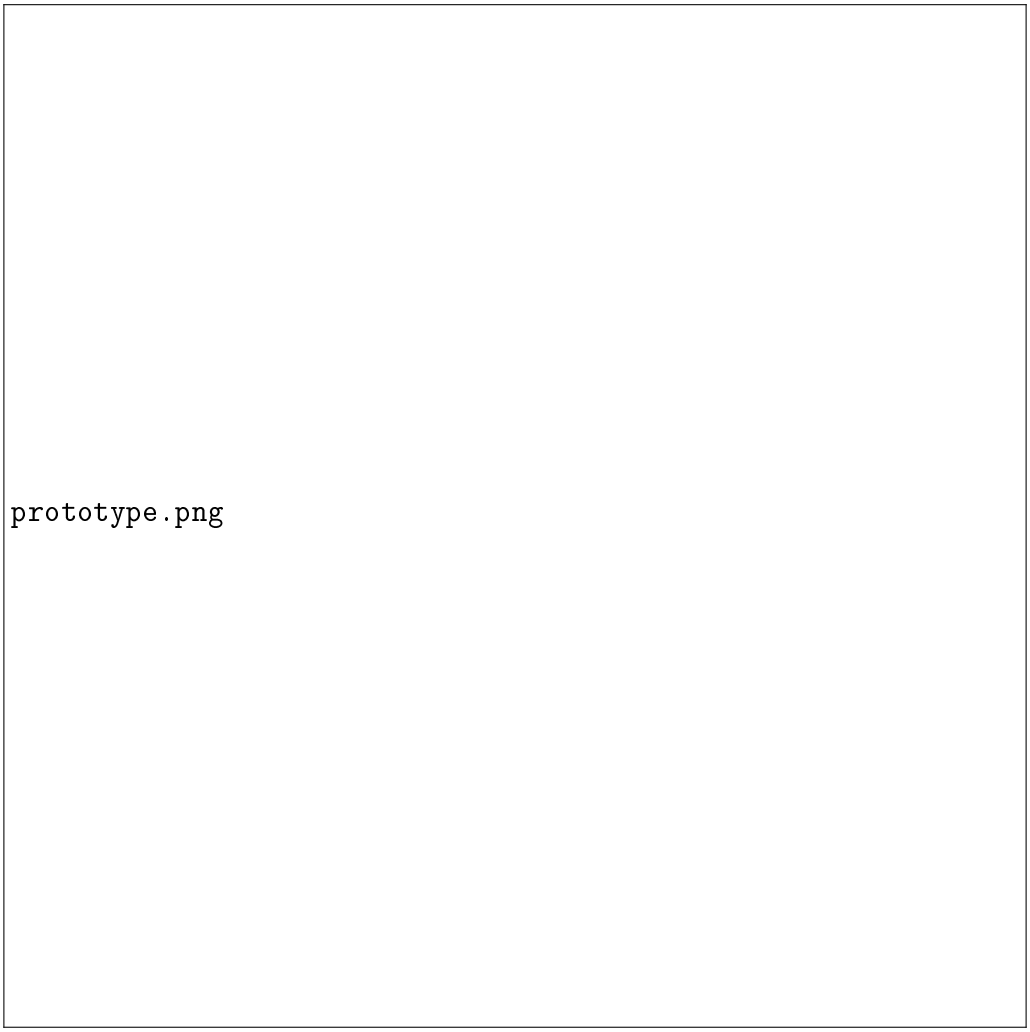

Figure 4: Prototype Model