Assignment-7.4 (SDLC)

→ what is SDLC?

The software development life cycle (SDLC) is a systematic process used by software developers to design, develop, & test high-quality software, ensuring the final product meets or exceeds customer expectations. Various SDLC models exists to suit different project requirement and development environments.

=> Phases of SDLC-

1) Planning - To outline the project goals, scope & constraints.
- → Define the project scope & objectives.
- → Identify project constraints & assumptions.
- → Develop a project plan & schedule.
- → Conduct feasibility studies.

2) Requirements Analysis - To gather & analyze the requirements for software.
- → Conduct stakeholder interviews & surveys.
- → gather detailed functional & non-functional requirements.
- → create requirements documentation.

3) Design - To design architecture & detailed specifications of software.
- → Define the system architecture.
- → Create detailed design documents, including database design, UI design and system interfaces.
- → Develop prototypes, if necessary.

4) Coding - To translate the design into code.
- → Write code for different modules & components.
- → Follow coding standards & guidelines.
- → perform unit testing.

5) **Testing** - To ensure the software functions correctly & meets requirements.

→ perform various types of testing.

→ identify & fix defects.

→ Conduct performance & security testing.

6) **Deployment** - To deploy the software in production environment.

→ prepare deployment plans.

→ Setup production environments.

→ deploy the software.

→ conduct a post-deployment review.

7) **Maintenance** - To maintain & enhance the software post-deployment.

→ monitor the software for issues.

→ perform regular updates & patches.

→ implement new features & enhancements.

→ provide technical support.

Various SDLC Models -

① **Waterfall Model -**

The waterfall model is a linear & sequential approaches where each phases must be completed before the next phases.

Advantages -

→ Simple & easy to understand.

→ Well-documented stages with clear deliverables.

Disadvantages -

→ inflexible to changes.

→ late testing phases can lead to costly fixes.

② Agile Method :

Agile is an iterative & incremental model emphasizing flexibility, collaboration, & customer feedback.

Advantages -

→ Adaptable to changing requirements.
→ continuous customer involvement & feedback.
→ frequent delivery of functional software.

Disadvantages

→ Requires active customer involvement.
→ Less predictable outcomes due to iterative nature.

③ Spiral Model -

The spiral method combines iterative development with systematic aspects of waterfall model, focusing on risk analysis.

Advantages -

→ Strong emphasis on risk management.
→ Suitable for large & complex project.

Disadvantages -

→ can be costly & time-consuming.
→ complex to manage & implement.

④ V-model -

The V-model is an extensible of waterfall model emphasizing verification & validation steps parallel to each development phases.

Advantages -

→ Enhanced testing & quality assurance.

→ Early detection of defects.

Disadvantages -

→ Inflexible to changes.

→ Similar drawbacks as waterfall model.