IT314 – Software Engineering

Lab Report 1

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Question: Choose Software Process Models

a) **A simple data processing project**

- Waterfall Model:
→ Here the project is simple, so using waterfall model is feasible as the requirements can be known beforehand. Also, using this model will provide better quality control and good control over software development process.

b) **A data entry system for office staff who have never used computers before. The user interface and user-friendliness are extremely important.**

- Prototyping Model:
→ As user friendliness and user interface are very important features of this project, prototyping model is best fit for it. This model ensures good user interface by using the resources effectively. Here, the progress is visible and the client is happy.

c) **A spreadsheet system that has some basic features and many other desirable features that use these basic features.**

- Incremental Model:
→ In incremental model, requirements divided into multiple modules of the software development cycle. Each of these modules go through the development phases and every subsequent modification adds functionality to previously added features. So, for this spreadsheet system, incremental model can be used.

d) A web-based system for a new business where requirements are changing fast and where an in-house development team is available for all aspects of the project.

- Agile:
→ Here, the requirements are changing fast, so we can use iterative or agile models for software development. We also have an in-house team for all aspects of the project, so, we prefer agile over iterative model because agile can work better with team of experts.

e) A Web-site for an on-line store which has a long list of desired features it wants to add, and it wants a new release with new features to be done very frequently.

- Incremental Model:
→ Incremental Model is a process of software development where requirements divided into multiple modules of the software development cycle. Every subsequent release of the module adds function to the previous release. So, incremental model can be used here.

f) A system to control anti-lock braking in a car.

- Waterfall Model/ Spiral Model:
→ We know all the functionalities that are required for anti-lock braking. As the requirements are known, waterfall model can be used. However, there are risks associated with braking system in the car. So, we can also use the spiral model as it works well for risk analysis and risk reduction.

g) A virtual reality system to support software maintenance

- Incremental Model/ Synchronize and Stabilize Model:
→ Here, we can release first build of the system and check whether it fulfils the system requirements or not and change the software accordingly. So, to implement this, we can use incremental or synchronize and stabilize model.

h) A university accounting system that replaces an existing system

- Waterfall Model:
→ We have an existing system. Hence, the requirements of the system are already known. So, we can use waterfall model. Using this model will also provide better quality control and good control over software development process. Other than that, waterfall model observes good software development practices such as define-before-design and design-before-code.

i) **An interactive system that allows railway passenger to find train times from terminals installed in stations.**

- Evolutionary Prototyping Model:
→ This project requires interactive system, so user interface is very important. Therefore, prototyping model can be used. Here, we can use evolutionary prototyping model to ensure that modifications/changes can be done at later stages of developing this system.

j) **Company has asked you to develop software for missile guidance system that can identify a target accurately.**

- Spiral Model:
→ Missile guidance system has associated risk factors. So, we can use spiral model to analyse the risks and perform risk reduction processes.

k) **When emergency changes have to be made to systems, the system software may have to be modified before changes to the requirements have been approved. Choose a process model for making these modifications that ensures that the requirements documents and the system implementation do not become inconsistent.**

- Agile:
→ Here, emergency changes have to be made to the systems. Agile software development process can handle frequent and anytime changes in requirements. Also, the code is the most important component in this model and documentation is secondary. So, agile model can be used here.

l) **Software for ECG machine.**

- Waterfall Model/ Spiral Model:
→ We know all the functionalities that are required for ECG machine. As the requirements are known, waterfall model can be used. However, there are risks associated with medical systems, involve risk to human lives. So, we can also use the spiral model as it works well for risk analysis and risk reduction.

m) **A small scale well understood project (no changes in requirement will be there once decided).**

- Waterfall Model:
→ The project is small scale, well understood and the requirements are decided beforehand. So, we can use waterfall model. Also, using this model will provide better quality control and good control over software development process.