IT-314 Software Engineering

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Lab-1: Choosing Software Process Models

a) A simple data processing project.

Model: Waterfall

Reason: A waterfall model would be appropriate since the project is simple and well-understood.

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

Model: Prototyping

Reason: The Prototyping model allows for early user involvement and feedback, which is crucial when designing a user interface for users who are not familiar with computers.

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

Model: Evolutionary Prototyping

Reason: For a system with changing requirements and a focus on adding new features step by step while building on what's already there, the Evolutionary Prototyping model is ideal. It's an iterative approach where the prototype is continually improved and expanded until it becomes the final product.

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.

Model: Agile

Reason: The Agile model is a great fit for this project as it values people over process and uses iterative steps. The in-house development team is available to easily handle new requirements.

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.

Model: Incremental

Reason: For a web-based system that requires frequent releases and prioritizes fast delivery of new features, the Incremental model would be a suitable choice. This model facilitates iterative development, allowing for flexibility in implementing necessary changes and is also beneficial in reducing Time to Market.

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

Model: Spiral
Reason: The Spiral model is perfect for safety-critical systems like car antilock braking. It focuses on risk analysis, iterative development, and frequent testing for high-quality control and continuous improvement.

g) A virtual reality system to support software maintenance

Model: Incremental or Synchronize and Stabilize

Reason: Our goal is to keep the software up-to-date, so in maintenance, we regularly check for updates and take necessary actions. The Incremental or Synchronized and Stabilized model fits well, as it periodically checks if requirements are met and releases the model after each build.

h) A university accounting system that replaces an existing system

Model: Waterfall

Reason: The Waterfall model is an appropriate choice when replacing an existing system, as the requirements are likely to be well-defined and stable.

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

Model: Evolutionary Prototyping

Reason: The evolutionary prototyping model offers advantages due to its emphasis on crucial user interface and usability, especially for passengers locating trains. It also proves effective for inexperienced users, like passengers with limited prior knowledge. Moreover, the model allows for iterative revisions and expansions, eliminating the need for complete rewrites each time

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

Model: Spiral

Reason: For safety-critical systems like a missile guidance system, a well-structured and comprehensive model such as the Spiral model would be appropriate. These models prioritize risk management, thorough testing, and verification at each stage to ensure accuracy and reliability.

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.

Model: Agile

Reason: Agile methodologies are suitable for making emergency changes, as they allow for quick adaptations and iterative development without the need for formal approvals at each step.

l) Software for ECG machine.

Model: Spiral

Reason: For safety-critical medical devices like an ECG machine, a suitable model that emphasizes thorough testing and verification is the Spiral model. It guarantees proper validation and verification of the software at each stage to meet stringent medical standards, ensuring accuracy and reliability.

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

Model: Waterfall model

Reason: The Waterfall model is appropriate for small-scale projects with well-defined and stable requirements.