# Lab Report – 1

# IT314 Software Engineering

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Group – 5

## Choosing Software Process Models

Giving reasons for your answer by taking examples (features, non-functional aspects, domain) based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following system.

A. A simple data processing project.
   Software Model – Waterfall
   Reason – As waterfall models are very simple and easy to execute, they can be used for managing this project accurately. They are logical and intuitive and provide better quality control over it.

B. A data entry system for office staff who have never used computers before. The user interface and user-friendliness are extremely important.
   Software Model – Prototyping
   Reason – As user interface and user-friendliness are extremely important, using a prototyping model can be beneficial as UI is very important in it. Also, it works well with novice users (office staff) who don't have any prior experience.

C. A spreadsheet system that has some basic features and many other desirable features that use these basic features.
   Software Model – Incremental
   Reason – As an incremental model can be used to develop the projects from step to step and use basic functionality to build better ones, it is highly suitable for this type of project. The basic functions built in earlier stages can be reused for upcoming updates.

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

Software Model – Agile or iterative

Reason – As the agile model focuses on the code, people over process and uses an iterative approach, it highly matches the requirement for the project. Also, an in-house development team is available, so the new requirements can be dealt with easily. Also, the iterative model can be used.

E. A website for an online 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.

Software Model – Incremental

Reason – As an incremental model can be used to develop the projects from step to step (faster changing requirements) and use basic functionality to build better ones, it is highly suitable for this type of project. The basic desired features built in earlier stages can be reused for upcoming releases of new features.

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

Software Model – Waterfall or Spiral

Reason – In anti-lock braking, reducing risk and ensuring safety is an important factor. Hence, we can spiral model to ensure these factors. Also, we can use the waterfall model as the requirements are fixed and pre-defined.

G. A virtual reality system to support software maintenance

Software Model – Incremental or Synchronize and Stabilize model

Reason – Here, in this system, our aim is to maintain the software. So, in maintenance, we need to regularly check for updates and take appropriate steps. Therefore, we can use the Incremental or Synchronize and Stabilize model as it releases the model after every build and checks if the requirements get fulfilled or not time-to-time.

H. A university accounting system that replaces an existing system

Software Model – Waterfall

Reason – As it is a well-understood, logical, and intuitive problem, using the waterfall model highly satisfies the need of the project. It also provides better quality control over the project.

I. An interactive system that allows railway passengers to find train times from terminals installed in stations.

Software Model – Evolutionary prototyping
Reason – As user interface and user-friendliness are extremely important, using an evolutionary prototyping model can be beneficial as UI is very important for the passenger to find the trains. Also, it works well with novice users (i.e., passengers) who might not have any prior experience. Also, it doesn't have to be rewritten every time and can be revised and expanded.

J. Company has asked you to develop software for a missile guidance system that can identify a target accurately.
Software Model – Spiral
Reason – The spiral model can accurately reflect the iterative nature of software development projects; it can decrease risk and provides good project visibility. As risk needs to be reduced significantly in missile guidance systems to identify targets accurately, using a spiral model can prove beneficial.

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 ensure that the requirements documents and the system implementation do not become inconsistent.
Software Model – Agile
Reason – As the agile model focuses on the code, people over process and uses an iterative approach, it highly matches the requirement for the project. As the changes need to be made immediately and urgently even before the changes are approved, agile suits best for the requirement as anytime changes are acceptable.

L. Software for ECG machine.
Software Model – Waterfall
Reason – As all the requirements are known priorly to the software developer for the ECG machine, the Waterfall model can be used here. It is intuitive as well as logical and works efficiently with well-understood problems with requirements known priorly.

M. A small scale well-understood project (no changes in requirement will be there once decided).
Software Model – Waterfall

Reason – As it is a small scale well-understood project and there are no changes of requirements, i.e., all the requirements are priorly known, we can use the waterfall model as it matches all the requirements of the project description.