

Chapter 2: Software processes

Your name:

Answer all questions. 1 mark per question

1. What is a software process? What are the fundamental activities that are common to all software processes?

A structured set of activities required to develop a software system.

Software specification

Software design and implementation

Software validation

Software evolution

2. What is software process model? List the 3 generic process models that are used in software engineering?

A software process model is an abstract representation of a process.

The waterfall model

Incremental development

Reuse-oriented software engineering

3. Why are iterations usually limited when the waterfall model is used?

The waterfall model is a document-driven model with documents produced at the end of each phase. Because of the cost of producing and approving documents, iterations are costly and involve significant rework. Hence they are limited.

4. What are the three benefits of incremental development, compared to the waterfall model?

- (a) *The cost of accommodating changes to customer requirements is reduced.*
- (b) *It is easier to get customer feedback on development work that has been done.*
- (c) *More rapid delivery and deployment of useful software to the customer is possible*

5. What are the development stages in reuse-based development?

Component analysis

Requirements modification

System design with reuse

Development and integration

2.1. Giving reasons for your answer 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 systems:

- A course registration system
- An online bookstore system
- A university accounting system that replaces an existing system
- An interactive travel planning system that helps users plan journeys with the lowest environmental impact

Ans:

1. A course registration system: If this system is developed at the first time, it will require a lot of up-front analysis before implementation. It certainly needs a **plan-driven** approach to development with the requirements carefully analysed. A **waterfall** model is therefore the most appropriate approach to use, perhaps with formal transformations between the different development stages.

If there are some similar existing systems, we can apply a **reuse-based** approach.

2. An online bookstore system: This is a system where the requirements will change to adapt new customer needs. **Incremental** development with, perhaps, some UI **prototyping** is the most appropriate model. An agile process may be used. In some cases, if some similar systems have been developed and the requirements are simple, a **reuse-based** approach might be applied.

3. *University accounting system*: This is a system whose requirements are fairly well-known and which will be used in an environment in conjunction with lots of other systems such as a research grant management system. Therefore, a **reuse-based** approach is likely to be appropriate for this.

4. *Interactive travel planning system*: System with a complex user interface but which must be stable and reliable. An **incremental** development approach is the most appropriate as the system requirements will change as real user experience with the system is gained.