Chapter 2: Software Processes

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

Answer：

Although there are many different software processes, they all must include, in some form, the four fundamental software engineering activities：

1. Software specification
2. Software development
3. Software validation
4. Software evolution

2. List 3 generic process models that are used in software engineering?

Answer：Three generic process models used in SE:

1. The waterfall model

2. Incremental development

3. Integration and configuration

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

Answer:

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 and costly and involve significant rework. Hence they are limited.

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

Answer:

1. The cost of implementing requirements changes is reduced.
2. It is easier to get customer feedback on the development work that has been done.

3. Early delivery and deployment of useful software to the customer is possible, even if all of the functionality has not been included.

5. What are the development stages in integration and configuration?

Answer:

1. Requirements specification
2. Software discovery and evaluation
3. Requirements refinement
4. Application system configuration
5. Component adaptation and integration

6. What are the principal requirements engineering activities?

Answer:

There are three main activities in the requirements engineering process:

1. Requirements elicitation and analysis
2. Requirements specification
3. Requirements validation

7. Why is it increasingly irrelevant to distinguish between software development and evolution?

Answer:

Distinction between development and maintenance is increasingly irrelevant. Very few software systems are completely new systems, and it makes much more sense to see development and maintenance as a continuum. Rather than two separate processes, it is more realistic to think of software engineering as an evolutionary process where software is continually changed over its lifetime in response to changing requirements and customer needs.

8. What are the advantages of using incremental development and delivery?

Answer:

Incremental delivery has a number of advantages:

1. Customers can use the early increments as prototypes and gain experience that informs their requirements for later system increments.
2. Customers do not have to wait until the entire system is delivered before they can gain value from it.
3. The process maintains the benefits of incremental development in that it should be relatively easy to incorporate changes into the system.
4. As the highest priority services are delivered first and later increments then integrated, the most important system services receive the most testing.

9. What are the two different approaches to process improvement and change that have been proposed?

Answer:

Two quite different approaches to process improvement and change are used:

1. The process maturity approach, which has focused on improving process and project management and introducing good software engineering practice into an organization.

2. The agile approach, which has focused on iterative development and the reduction of overheads in the software process.

10. What are the identified levels in the SEI's Capability Maturity Model?

Answer:

The levels in the process maturity model are:

1. Initial
2. Managed
3. Defined
4. Quantitatively managed
5. Optimizing