

*Methods of IT Project Management* (Brewer/Dittman)

**Chapter 2 A Systems View and Systems Methodology**

**2.1 Essay Questions**

1) Explain what is meant by "systems approach".

Answer: Systems approach is the ability to examine problems or opportunities in the environment or entire organization that they exist in, and then decomposing those problems into smaller components, thus making them easier to understand and then solve, and finally managing the resolution of those problems. It's utilizing the systems development life cycle to plan, identify requirements, design the solution, and then implement it all while using a separate methodology to manage it all. The key is using the appropriate systems development life cycle or process based on the characteristics of the project.

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2) Describe the relationship between the project management life cycle (PMLC) and the system development life cycle (SDLC) and how they work together.

Answer: Projects have a life cycle which is separate but integrated with the products' system development life cycle. Project managers divide projects into phases to facilitate better communication and control. When we put these phases together into a prescribed order, we have the project life cycle. Many organizations have a formal information system development process consisting of a standard set of processes or activities to follow to build a system. A SDLC is a systems approach to problem solving that organizes these processes into phases for the purpose of building an information system product starting with the initial planning processes and carrying through to implementation and support. The PMLC and SDLC each contains phases, deliverables, and decisions to be made before moving to a subsequent phase, but the focus and work product are very different. See figure 2-9 in the text.

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3) Define and explain "objectives" with respect to a system and project.

Answer: Open systems are designed to do something to change an input into an output via an internal process. The something that the system is designed to do is spelled out in the list of objectives. Our IT projects consist of customer driven requirements or outputs they need from the system. Based on the desired outcomes and our knowledge of the inputs we must build a project plan which describes the process of changing the inputs into outputs (meeting the objectives) and dealing with the changes the environment brings.

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4) List and define the three interrelated components of a systems approach.

Answer: The systems approach consists of three interrelated components: systems theory; systems analysis; and systems management. Systems theory involves a philosophy of, or a way of looking at the world - a language or set of principles and interventions for thinking and problem solving. Systems analysis is "a problem-solving technique that decomposes a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purpose" [Whitten, Bentley, Dittman]. The systems management component is responsible for the management of the whole system - objectives, environment both internal and external, constraints, resources both human and non-human, and culture and social environment of the organization. Systems management is what project management is all about.

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5) In order to put a project in context, what are some of the questions that need to be answered.

Answer: When a project manager is handed a new project, one of the first things to do is put the project in context. The following are examples of questions that need to be answered in order to do that. 1) Who is the project sponsor? 2) What other projects are on-going or pending that might have an impact on this project? 3) What outside influences could have an impact on this project? 4) What early constraints, if any, have been placed on the project from a scope, time, and/or cost perspective?

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6) What are the six phases of the project life cycle?

Answer: The six phases of the project life cycle are: Initiate; Plan; Execute; Control; Close Iteration; and Close Project.

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7) List the items that should be included in the project life cycle.

Answer: The project life cycle should include: what specific work (activities) should be done in each phase; a definition of each phase's deliverable (outcomes); the integrated change control process being used; what resources are involved with each deliverable; criteria that needs to be met to complete each phase.

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8) Describe some steps of the process during a "Close Iteration" phase.

Answer: "Close Iteration" addresses those process steps that happen at the end of each iteration, such as: 1) Did we get everything done in this iteration we planned to?; 2) If not, what is remaining and when will it get done?; 3) Iteration lessons learned review; 4) Schedule the next iteration.

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9) Describe some steps of the process during a "Close Project" phase.

Answer: The "Close Project" phase occurs after the team has determined to complete the project. This determination could be attributed to many factors, such as we satisfied all requirements or we ran out of money. In this final phase, we update our project database with final results, conduct a thorough lessons learned exercise, and release project resources.

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10) Explain the waterfall model as a SDLC methodology, as well as its advantages and disadvantages.

Answer: The waterfall model is considered the traditional approach to systems development. It describes a development approach that is linear and sequential, has distinct objectives for each phase, and the output of one phase is the input for the next. It received its name from the fact that once water goes over the falls, it cannot turn back or go back up. In waterfall systems development, once a phase is complete you can't return to a prior phase. The advantage of waterfall development is that it allows for strict managerial control. Some other advantages are: it is well understood; works well for large, complex applications; works well with geographically distributed teams; and works well when less experienced IT personnel are involved in the project. The primary disadvantage of the waterfall model is that it does not easily accommodate changes to requirements. Some other disadvantages: all requirements must be known and defined in the beginning; does not allow to go back and repeat a phase (iterate); adaptability to different project types; encourages communication gaps between users and IT personnel.

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## 2.2 True/False Questions

1) There are different types of life cycles to choose from when building a solution.

Answer: TRUE

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2) The project management life cycle (PMLC) is the equivalent of the system development life cycle (SDLC).

Answer: FALSE

Diff: 2 Page Ref: 32

3) The systems approach is a process that allows projects to be viewed in the context of the entire internal organization.

Answer: FALSE

Diff: 3 Page Ref: 33

4) A system is a set of interacting, interrelated, or interdependent elements working to create a whole.

Answer: TRUE

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5) A system is made up of subsystems, smaller systems that are part of a larger system.

Answer: TRUE

Diff: 1 Page Ref: 34

6) An element is the smallest part of a system.

Answer: TRUE

Diff: 1 Page Ref: 34

7) An attribute is an individual characteristic that is part of systems and subsystems.

Answer: TRUE

Diff: 1 Page Ref: 34

8) A boundary surrounds the system and integrates it into the environment.

Answer: FALSE

Diff: 1 Page Ref: 34

9) The environment is everything that exists outside of the system.

Answer: TRUE

Diff: 1 Page Ref: 35

10) A list of objectives is rarely based on the customer driven requirements.

Answer: FALSE

Diff: 2 Page Ref: 35

11) For a system to reach its objectives, all of the subsystems and elements must work together effectively.

Answer: TRUE

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12) Although all projects are influenced by forces in the environment, these cannot be allowed to control the outcome of the project.

Answer: TRUE

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13) Techniques such as risk analysis are tools that project managers can use to keep environment forces in check.

Answer: TRUE

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14) In traditional system development projects, a systems designer studies the needs presented by users and attempts to understand them and have them understood by others.

Answer: FALSE

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15) Each project life cycle may or may not have an end.

Answer: FALSE

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16) The gaps between project phases are often called "stage gates".

Answer: TRUE

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17) A life cycle is a random order of phases in which each contains a specific deliverable which collectively deliver a result.

Answer: FALSE

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18) The project life cycle phases (Initiate, Plan, Execute, Control, Close Iteration, Close Project) have the same meaning as the five major project management process groups.

Answer: FALSE

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19) A "Close Iteration" phase addresses those process steps that happen at the end of each iteration.

Answer: TRUE

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20) The "Close Project" phase occurs after we have determined to complete the iteration.

Answer: FALSE

Diff: 1 Page Ref: 37

21) The waterfall model allows for strict managerial control.

Answer: TRUE

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22) The waterfall approach works well for information systems projects because all requirements can be defined at the beginning and remain stable throughout the information systems project.

Answer: FALSE

Diff: 2 Page Ref: 39

23) One of the strengths of the waterfall approach is that it works well for large, complex applications.

Answer: TRUE

Diff: 2 Page Ref: 39

24) In evolutionary prototyping, requirements are known and defined at the beginning of the project.

Answer: FALSE

Diff: 2 Page Ref: 39

25) The prototyping approach is an excellent choice for research and development projects because these types of projects have many unknowns with respect to requirements.

Answer: TRUE

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26) With the prototyping approach, quickly building mockups of the system components delays feedback from users.

Answer: FALSE

Diff: 1 Page Ref: 40

27) The spiral life cycle model helps demonstrate a proof of concept early in the project.

Answer: TRUE

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28) The spiral life cycle model consists of four main parts, and the process is shown by a continuous loop going from the outside towards the inside.

Answer: FALSE

Diff: 3 Page Ref: 40

29) One of the strengths of the iterative and incremental life cycle model is that it is easier to test and debug during a smaller iteration.

Answer: TRUE

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30) The Scrum approach is based on the concept that software development is a defined process.

Answer: FALSE

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### 2.3 Multiple Choice Questions

1) Choosing a lifecycle is dependent on all of the following factors, EXCEPT:

A) Type of product being built.

B) Project team size.

C) Criticality of the application.

D) Name of the project.

Answer: D

Diff: 3 Page Ref: 32

2) Projects have a life cycle which is separate but integrated with the products':

A) System development life cycle (SDLC).

B) System design life cycle (SDLC).

C) Project development life cycle (PDLC).

D) Project management life cycle (PMLC).

Answer: A

Diff: 2 Page Ref: 32

3) The systems approach is a process which allows projects to be viewed in the \_\_\_\_\_ of the entire environment.

A) exclusion

B) context

C) perspective

D) inside

Answer: B

Diff: 2 Page Ref: 33

4) The systems approach is the opposite of a(n) \_\_\_\_\_ process, which takes the whole and breaks it into its component parts.

- A) analytical
- B) critique
- C) breakdown
- D) drilldown

Answer: A

Diff: 3 Page Ref: 33

5) The systems approach consists of \_\_\_\_\_ interrelated components.

- A) five
- B) four
- C) three
- D) two

Answer: C

Diff: 3 Page Ref: 33

6) Which of the following is NOT one of the interrelated components comprising the systems approach?

- A) System
- B) Systems theory
- C) Systems analysis
- D) Systems management

Answer: A

Diff: 3 Page Ref: 33

7) Systems theory involves a philosophy of, or way of looking at the world - a language or set of \_\_\_\_\_ and interventions for thinking and problem solving.

- A) opinions
- B) words
- C) instructions
- D) principles

Answer: D

Diff: 2 Page Ref: 33

8) There are two broad categories of systems - open and \_\_\_\_\_.

- A) closed
- B) free
- C) purchased
- D) built

Answer: A

Diff: 1 Page Ref: 34

9) A closed system is considered to be completely \_\_\_\_\_.

- A) integrated
- B) modifiable
- C) self-contained
- D) manageable

Answer: C

Diff: 1 Page Ref: 34

10) An open system is not \_\_\_\_\_.

- A) manageable
- B) self-defining
- C) modifiable
- D) free

Answer: B

Diff: 1 Page Ref: 34

11) An element is the \_\_\_\_\_ part of a system.

- A) smallest
- B) largest
- C) least significant
- D) most significant

Answer: A

Diff: 1 Page Ref: 34

12) A boundary surrounds the system and \_\_\_\_\_ it from the environment.

- A) separates
- B) extracts
- C) processes
- D) takes

Answer: A

Diff: 2 Page Ref: 34

13) The environment is everything that exists outside of the system or outside of the control of the \_\_\_\_\_.

- A) executive
- B) machine
- C) project manager
- D) boundary

Answer: C

Diff: 2 Page Ref: 35

14) Which term best describes the limitations forced on a system by internal or external forces.

- A) Objectives
- B) Environment
- C) Integration
- D) Constraints

Answer: D

Diff: 1 Page Ref: 35

15) Using the \_\_\_\_\_ approach will aid project managers to identify and understand all of the pressures that the external environment can create.

- A) project
- B) systems
- C) integration
- D) open

Answer: B

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16) Systems \_\_\_\_\_ is a "problem-solving technique that decomposes a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purpose" [Whitten, Bentley, Dittman].

- A) analysis
- B) design
- C) implementation
- D) management

Answer: A

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17) The systems \_\_\_\_\_ component is responsible for the management of the whole system.

- A) management
- B) analysis
- C) integration
- D) theory

Answer: A

Diff: 2 Page Ref: 36

18) Which of the interrelated components comprising a system is what project management is all about?

- A) Systems theory
- B) Systems analysis
- C) Systems management
- D) Systems integration

Answer: C

Diff: 2 Page Ref: 36

19) Project managers divide projects into \_\_\_\_\_ to facilitate better communication and control.

- A) subsystems
- B) teams
- C) objects
- D) phases

Answer: D

Diff: 2 Page Ref: 36

20) Each \_\_\_\_\_ life cycle should have a beginning and an end.

- A) project
- B) system
- C) solution
- D) application

Answer: A

Diff: 2 Page Ref: 36

21) Each project \_\_\_\_\_ should have defined deliverables and criteria that signal that it is time to move to the next.

- A) phase
- B) life cycle
- C) objective
- D) manager

Answer: A

Diff: 3 Page Ref: 36

22) What is the decision making opportunity between phases or iterations in the project life cycle?

- A) phase
- B) project life cycle
- C) stage gate
- D) iterations

Answer: C

Diff: 2 Page Ref: 36

23) Which of the following is NOT one of the project life cycle phases?

- A) Sponsor
- B) Plan
- C) Close Iteration
- D) Close Project

Answer: A

Diff: 2 Page Ref: 36

24) \_\_\_\_\_ are small releases delivered throughout the project, each following the life cycle.

- A) Sub-projects
- B) Sub-systems
- C) Iterations
- D) Projects

Answer: C

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25) Waterfall, RUP, SCRUM, and XP are examples of SDLC \_\_\_\_\_.

- A) projects
- B) methodologies
- C) products
- D) steps

Answer: B

Diff: 2 Page Ref: 38

26) The primary disadvantage of the waterfall model is that it does not easily accommodate \_\_\_\_\_.

- A) resources
- B) project managers
- C) changes to requirements
- D) vacation time

Answer: C

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27) Which of the following is NOT a weakness of the waterfall approach?

- A) Does not accommodate changes to requirements very well
- B) All requirements must be known and defined at the beginning.
- C) Does not work well for geographically distributed teams
- D) Does not allow to go back and repeat a phase

Answer: C

Diff: 2 Page Ref: 39

28) Evolutionary \_\_\_\_\_ focuses on gathering correct and consistent requirements and is the approach of building a system incrementally.

- A) prototyping
- B) development
- C) refinement
- D) management

Answer: A

Diff: 2 Page Ref: 40

29) In evolutionary prototyping, requirements are discovered throughout the process and the system is repeatedly \_\_\_\_\_ based on those discoveries.

- A) refined
- B) redesigned
- C) discarded
- D) approved

Answer: A

Diff: 2 Page Ref: 40

30) Which of the following is NOT a strength of evolutionary prototyping life cycle?

- A) Customers can see steady progress
- B) Feedback from user reviews is timely
- C) Allows for accurate cost estimating at the beginning
- D) Helps gain customer commitment to a set of requirements

Answer: C

Diff: 3 Page Ref: 41

31) The \_\_\_\_\_ life cycle model is a series of short waterfall cycles.

- A) evolutionary prototyping
- B) spiral
- C) waterfall
- D) incremental

Answer: B

Diff: 3 Page Ref: 40

32) In the diagram of a spiral life cycle model, the angular component represents progress, and the radius of the spiral represents \_\_\_\_\_.

- A) scope
- B) time
- C) cost
- D) quality

Answer: C

Diff: 3 Page Ref: 40

33) A weakness of the spiral life cycle model is:

- A) That the project's success is highly dependent on the risk analysis phase.
- B) It does not accommodate change well.
- C) It cannot react to risks quickly.
- D) All of the above

Answer: A

Diff: 3 Page Ref: 41

34) In the \_\_\_\_\_ life cycle model, a working version of the software is produced during the first iteration.

- A) evolutionary prototyping
- B) spiral
- C) waterfall
- D) iterative and incremental

Answer: D

Diff: 3 Page Ref: 42

35) The main idea of Scrum is that systems development involves several environmental and technical \_\_\_\_\_ that are likely to change during the process.

- A) resources
- B) variables
- C) requirements
- D) projects

Answer: B

Diff: 2 Page Ref: 43

36) Which of the following is NOT a phase of the RUP approach?

- A) Inception
- B) Elaboration
- C) Construction
- D) Lessons Learned

Answer: D

Diff: 2 Page Ref: 44

37) In the Scrum approach, each phase contains one or more iterations where a(n) \_\_\_\_\_ is produced.

- A) executable
- B) system
- C) product
- D) service

Answer: A

Diff: 3 Page Ref: 43

38) Which of the following is a key value of the Extreme Programming approach?

- A) Communication
- B) Feedback
- C) Simplicity
- D) All of the above

Answer: D

Diff: 2 Page Ref: 44

39) Which of the following is NOT an XP practice?

- A) Courage
- B) Planning
- C) Small releases
- D) Testing

Answer: A

Diff: 3 Page Ref: 45

40) In the XP approach, \_\_\_\_\_ is/are integrated into the build process.

- A) coding standards
- B) testing
- C) meetings
- D) planning

Answer: B

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