

CHAPTER 2

SYSTEMS TECHNIQUES AND DOCUMENTATION

LEARNING OBJECTIVES

1. Characterize the use of systems techniques by auditors and systems development personnel.
2. Describe the use of flowcharting techniques in the analysis of information processing systems.
3. Define common systems techniques, such as HIPO charts, system flowcharts, and logical data flow diagrams.

TRUE/FALSE QUESTIONS

1. Tools used in the analysis, design, and documentation of system and subsystem relationships are known as system techniques.
(moderate, page 31, true)
2. The interim audit requires some type of substantive testing.
(easy, page 31, false)
3. Substantive testing involves direct verification of financial statement figures.
(moderate, page 31, true)
4. When evaluating internal controls, auditors are usually not concerned with the flow of processing and distribution of documents within an application system.
(moderate, page 32, false)
5. Auditors undertake compliance testing to determine the degree of reliance of existing internal controls.
(moderate, page 32, true)
6. It is desirable for auditors to have a basic understanding of systems techniques.
(easy, page 32, true)
7. The usual focus of an audit is to review an existing system rather than design a new system.
(moderate, page 32, true)
8. Analytic and system flowcharts are seldom found in the working papers of auditors.
(easy, page 32, true)
9. A systems development project generally consists of six phases.
(moderate, page 32, false)
10. Systems techniques assist the analyst in the collection and organization of facts.
(moderate, page 33, true)

11. Systems analysis involves formulating a blueprint for a completed system.
(moderate, page 33, false)
12. Auditors primarily use IPO and HIPO charts.
(easy, page 37, false)
13. Manual input and display symbols are among the basic flowchart symbols.
(moderate, 34, false)
14. In the United States, the AICPA is responsible for establishing standard flowchart symbols.
(easy, page 33, false)
15. The four basic symbols corresponding to basic data processing functions are the input/output symbol, the process symbol, the flowline symbol, and the annotation or comment symbol.
(moderate, page 34, true)
16. If no special symbol exists to depict a function, verbal descriptions are used in the flowchart.
(difficult, page 34, false)
17. The decision symbol represents a named procedure consisting of one or more operations or program steps that are not specified within the set of flowcharts.
(difficult, page 35, false)
18. The normal flow direction of a flowchart is from left to right and top to bottom.
(easy, page 36, true)
19. The triangle is a specialized symbol representing a decision process.
(difficult, page 36, false)
20. When the flow is bidirectional, it can only be shown by double lines.
(difficult, page 36, false)
21. An IPO chart provides a narrative description of the inputs needed to generate desired system outputs.
(moderate, page 38, true)
22. A HIPO chart contains two segments: a hierarchy chart and one or more IPO charts.
(easy, page 38, true)
23. AN IPO chart can provide much detail concerning the processing function.
(easy, page 37, false)
24. HIPO structures a “bottom-up” strategy in structured systems analysis and design.
(moderate, page 38, false)
25. A program flowchart is also known as a block flowchart.
(easy, page 39, true)

26. The intent of using DFDs is to clearly separate the logical process of systems analysis from the physical process of systems design.
(moderate, page 39, true)
27. A DFD may consist of either DFD or ANSI flowchart symbols.
(moderate, page 40, false)
28. A document flowchart is similar to a systems flowchart.
(difficult, page 42, false)
29. The forms distribution chart is closely related to the document flowchart.
(easy, page 43, true)
30. The sandwich rule states that every process symbol should be placed between an input and output symbol.
(moderate, page 46, true)

FILL-IN-THE-BLANK QUESTIONS

31. Preparing flowcharts can be viewed as more _____ than _____.
(moderate, page 47, art; science)
32. _____ are a fact-gathering technique where persons provide written answers to general, rather than specific, questions.
(moderate, page 49, Open-ended; questionnaires)
33. _____ is based on the premise that quantitative measurement is essential to the design of efficient procedures.
(moderate, page 49, Work; measurement)
34. The formula for capacity utilization can be expressed as Total time _____ / Total _____ time.
(moderate, page 49, available; task)
35. After operational characteristics of a system have been identified and selected through some form of work measurement, a work _____ must be undertaken to assign specific tasks to employees.
(moderate, page 50, distribution; analysis)
36. The basic _____ symbol represents the making available of data for processing of the recording of processed information.
(easy, page 34, input/output)
37. A(n) _____ flowchart identifies the overall flow of operations in a system, and focuses on storage media and processing functions.
(easy, page 39, systems)
38. _____ flowcharts are organized into columns or groups representing processing functions performed by different entities.

(easy, page 42, *Analytic or Document*)

39. When a flowchart covers more than one page, the continuation between pages is shown with a _____ symbol.
(easy, page 36, *connector*)
40. Terminator, process, data store, and data flow are the primary symbols used in the construction of _____.
(easy, page 39, *logical data flow diagrams or DFDs*)
41. The _____ is a specialized process symbol that represents a decision process in a flowchart.
(moderate, page 36, *diamond*)
42. A branching table depicts a decision function by means of a statement of the _____ to be made, a list of _____ that can occur, and the path to be followed for each condition.
(moderate, page 51, *decision; conditions*)
43. “Work” or “spread” sheets used in accounting systems are common examples of the _____ method.
(easy, page 53, *matrix*)
44. _____ might be used in lieu of program flowcharts to analyze and document the logic of an application system.
(moderate, page 53, *Decision; tables*)
45. The _____ symbol is used when additional descriptions or explanations are needed to clarify a point on the flowchart.
(easy, page 37, *annotation*)

MULTIPLE-CHOICE QUESTIONS

46. The acronym for the organization responsible for standardizing flowchart symbols is:
a. FASB
b. ANSI
c. AICPA
d. CMA
(easy, page 33, b)
47. Audit tests that follow compliance tests and rely on the interim audit’s results are called:
a. substantive test
b. follow-up tests
c. internal control tests
d. evaluation tests
(easy, page 31, a)

48. Which of the following is a procedure included in systems design?
- a. Computer program documentation
 - b. Forms design
 - c. Training personnel
 - d. Document review
- (moderate, page 33, d)**
49. In an analytic flowchart, the symbol which could be used to indicate unclaimed payroll checks is the:
- a. connector symbol
 - b. terminal symbol
 - c. document symbol
 - d. process symbol
- (moderate, page 42, c)**
50. Which of the following symbols should **not** be used to specify an input/output operation?
- a. decision symbol
 - b. document symbol
 - c. off-line storage symbol
 - d. communication link
- (moderate, page 35, a)**
51. In an analytic flowchart, the symbol which could be used to indicate the computation of gross pay is the:
- a. connector symbol
 - b. terminal symbol
 - c. input/output symbol
 - d. process symbol
- (moderate, page 44, d)**
52. In an analytic flowchart, the symbol which could be used to indicate unclaimed payroll checks is the:
- a. connector symbol
 - b. terminal symbol
 - c. document symbol
 - d. process symbol
- (moderate, page 44, c)**
53. In an analytic flowchart, the symbol which could be used to indicate the payroll data is the:
- a. connector symbol
 - b. magnetic disk symbol
 - c. terminator symbol
 - d. decision symbol
- (moderate, page 35, b)**

54. The manual input symbol could be used to represent:
- a. the entering of data at an on-line keyboard
 - b. the entering of data using switch settings
 - c. the entering of data using touch screens
 - d. All of these answers are correct.
- (moderate, page 35, d)**
55. The off-line storage symbol could be used to represent data stored:
- a. on diskettes
 - b. on magnetic tapes
 - c. in paper form
 - d. on all of these named media
- (moderate, page 34, d)**
56. The “hierarchy” aspect of HIPO charts refers to the fact that this technique factors a task into modules by:
- a. using the entity’s organization chart
 - b. utilizing a horizontal approach
 - c. going from the general to the specific
 - d. None of these answers are correct.
- (moderate, page 38, c)**
57. The charting technique which emphasizes a logical rather than a physical description of a system is a(n):
- a. analytic flowchart
 - b. forms distribution flowchart
 - c. data flow diagram
 - d. document flowchart
- (moderate, page 39, c)**
58. In the preparation of a logical data flow diagram for a payroll system, which of the following symbols could be used to indicate the payroll data?
- a. magnetic disk symbol
 - b. data store symbol
 - c. terminator symbol
 - d. input/output symbol
- (moderate, page 39, b)**
59. Instead of using the on-line storage symbol, a systems analyst wants to use an analytic flowcharting symbol that represents the medium that is used for the file. Which of the following would be the best symbol to use in place of the on-line analytic storage symbol?
- a. The display symbol
 - b. The magnetic tape symbol
 - c. The document symbol
 - d. None of these answers are correct.
- (difficult, pages 35, d)**

60. An internal auditor wants to flowchart a file of (hardcopy) purchase orders. Which of the following would be the best symbol to use for the file?
- a. The on-line storage symbol
 - b. The off-line storage symbol
 - c. The terminal symbol
 - d. The auxiliary operation symbol
- (difficult, page 35, b)**
61. Which of the following analytic flowcharting symbols is most appropriate to represent the accounts receivable subsidiary records?
- a. The basic input/output symbol
 - b. The basic manual operation symbol
 - c. The document symbol
 - d. None of these answers are correct.
- (difficult, pages 34, a)**
62. In a HIPO chart of a payroll system, which of the following activities would appear higher in the chart than the other activities?
- a. Calculate gross pay
 - b. Accumulate hours worked
 - c. Find correct pay rate
 - d. Look up authorized deductions
- (difficult, page 38, a)**
63. Which of the following would **not** appear in a HIPO chart of a payroll system?
- a. Data preparation
 - b. Calculate gross pay
 - c. Payroll master file
 - d. Look up authorized deductions
- (difficult, page 38, c)**
64. In an IPO chart of a payroll system, the payroll master file would:
- a. appear as an input
 - b. appear as an output
 - c. Answers a and b are correct.
 - d. not be represented in the chart
- (difficult, page 38, c)**
65. In a logical data flow diagram for a payroll system, the employees would best be represented by which of the following symbols?
- a. The process symbol
 - b. The terminator symbol
 - c. The data store symbol
 - d. The data flow symbol
- (difficult, page 40, b)**

66. In a logical data flow diagram for a payroll system, the employees' time cards would best be represented by which of the following symbols?
- a. The terminator symbol
 - b. The process symbol
 - c. The data store symbol
 - d. The data flow symbol
- (difficult, page 40, a)**
67. Which of the following systems development activities may require the use of systems techniques?
- a. systems analysis
 - b. systems design
 - c. systems implementation
 - d. All of these answers are correct.
- (easy, page 33, d)**
68. Which of the following is **not** one of the basic symbols used in analytic flowcharting?
- a. input/output
 - b. manual input
 - c. flowline
 - d. annotation
- (easy, page 44, b)**
69. The symbol which is used to link other symbols and indicate the sequence of information and operations is the:
- a. flowline symbol
 - b. annotation symbol
 - c. input/output symbol
 - d. process symbol
- (easy, page 34, a)**
70. Which of the following is **not** a specialized input/output symbol that represents a particular medium?
- a. the magnetic tape symbol
 - b. the magnetic disk symbol
 - c. the connector symbol
 - d. the document symbol
- (easy, page 34, c)**
71. Which of the following is **not** a specialized process symbol?
- a. The connector symbol
 - b. The manual operation symbol
 - c. The decision symbol
 - d. The preparation symbol
- (easy, page 34, a)**

72. Which of the following flow directions is(are) assumed in a flowchart?
- a. From top to bottom
 - b. From left to right
 - c. Neither answer a nor b is correct.
 - d. Answers a and b are both correct.
- (easy, page 36, d)**
73. The technique that is characterized by a series of charts that represent the system at increasing levels of detail is called:
- a. analytic flowcharting
 - b. HIPO
 - c. IPO
 - d. logical data flow diagram
- (easy, page 38, b)**
74. Which of the following is **not** a basic symbol used in logical data flow diagrams?
- a. Terminator
 - b. Data store
 - c. Data flow
 - d. Manual input
- (easy, page 39, d)**
75. Which of the following would **not** be appropriate to head a column in an analytic flowchart?
- a. Remittance advice
 - b. Production department
 - c. Purchasing department
 - d. Cashier
- (easy, page 42, a)**
76. Which of the following would generally **not** be appropriate in preparing a document flowchart?
- a. Columnar headings
 - b. Flowlines
 - c. Process symbols
 - d. Connector symbols
- (easy, page 42, c)**
77. A type of resource utilization technique which is used to rationally assign work activities to particular individuals, departments, or other entities is:
- a. work measurement
 - b. work distribution analysis
 - c. branching table
 - d. decision table
- (easy, page 50, b)**

78. Which of the following is an example of narrative techniques?
- a. depth interviews
 - b. open-ended questionnaires
 - c. document reviews
 - d. All of these answers are correct.
- (easy, page 49, d)**
79. The decision analysis techniques that are similar because both are tabular representations of decision-making processes are:
- a. work measurement and work distribution analysis
 - b. work distribution and decision tables
 - c. branching and decision tables
 - d. None of these answers are correct.
- (easy, page 51, c)**
80. Systems techniques may be used to:
- a. assist in designing computer programs.
 - b. give an overall picture of transaction processing in the organization.
 - c. assist a systems analyst in organizing facts about a system.
 - d. All of these answers are correct.
- (easy, page 31, d)**
81. Which of the following is **not** true with respect to the use of systems techniques by auditors?
- a. Systems techniques assist the auditor in evaluating a client's internal control.
 - b. Systems techniques replace audit working papers.
 - c. Auditors rely on systems techniques to assist with compliance testing.
 - d. Auditors use systems techniques as part of their documentation for their audit working papers.
- (moderate, page 32, b)**
82. Systems techniques may be used by:
- a. internal auditors
 - b. external auditors
 - c. systems personnel
 - d. All of these answers are correct.
- (easy, page 31, d)**
83. The component of an audit whose objective is to establish the degree of reliance that can be placed on the organization's internal control structure is called:
- a. the interim audit
 - b. the financial statement audit
 - c. work paper verification
 - d. the internal audit
- (easy, page 31, a)**

84. To confirm the existence and assess the effectiveness of an organization's internal controls, auditors:
- a. create systems techniques
 - b. perform substantive testing
 - c. perform compliance testing
 - d. create HIPO and IPO charts
- (moderate, page 32, c)**
85. The flowchart which is most similar to a document flowchart is the:
- a. IPO chart
 - b. DFD
 - c. analytic flowchart
 - d. HIPO chart
- (moderate, page 42, c)**
86. The first step in preparing a flowchart is to:
- a. select the symbols to be used
 - b. analyze the system
 - c. sketch a rough draft of the system
 - d. consult the work papers from previous audits
- (moderate, page 48, b)**
87. How many general guidelines should be followed when preparing a flowchart?
- a. Three
 - b. Five
 - c. Seven
 - d. Four
- (moderate, page 48, b)**
88. The goal of work measurement is to create a benchmark or yardstick to use in measuring the efficiency of an operation. The first step taken in work measurement is to:
- a. identify the tasks
 - b. analyze requirements
 - c. examine IPO and HIPO documentation
 - d. obtain time estimates for performing the tasks
- (moderate, page 49, a)**
89. The formula used to compute total task time for work measurement purposes is:
- a. $(\text{average time} / \text{unit} + \text{idle time} / \text{unit}) \times \text{average volume}$
 - b. $\text{total time available} / \text{total task time}$
 - c. $(\text{average volume} / \text{unit} + \text{average time} / \text{unit}) \times \text{average volume}$
 - d. $\text{total task time} / \text{total time available}$
- (moderate, page 49, a)**
90. A branch table may be used to:
- a. validate the degree of reliance placed on an organization's internal controls
 - b. document the decision logic in a computer program
 - c. document work measurement analysis
 - d. validate the computing speed of a program
- (moderate, page 51, b)**

91. A decision table format generally uses a(n):
a. "or" premise
b. "some, many" premise
c. "if, then" premise
d. "all, none" premise
(moderate, page 51, c)
92. In an application control matrix, row entries are:
a. controls
b. processing actions
c. either controls or processing actions
d. neither controls nor processing actions
(moderate, page 53, a)
93. A block flowchart is also known as a(n):
a. data flow diagram
b. HIPO chart
c. analytic flowchart
d. program flowchart
(easy, page 39, d)
94. A tabular technique used to represent a decision function in a flowchart is known as a:
a. block flowchart
b. logical data flow diagram
c. decision table
d. branching table
(moderate, page 51, d)
95. The display symbol in a flowchart represents information displayed for human use using a device such as a:
a. video monitor
b. plotter
c. console printer
d. All of these answers are correct.
(easy, page 34, d)
96. Flowchart symbols that represent the I/O function and the medium upon which the information is recorded, and/or the manner of handling such information, are known as:
a. basic input/output symbols
b. specialized input/output symbols
c. LDFD symbols
d. HIPO hierarchy chart modules
(easy, page 34, b)

97. The principle behind the “sandwich rule” states that:
- a. flowcharts should leave as little white space as possible on each page to minimize waste
 - b. annotations should be placed between each key input and output symbol
 - c. every process symbol should be placed between an input and output symbol
 - d. flowcharts should use as many different types of symbols as possible to thoroughly document basic I/O functions
- (easy, page 46, c)**
98. Connector symbols may be used in place of:
- a. comment symbols
 - b. long flowlines
 - c. data flow symbols
 - d. communications links
- (easy, page 46, b)**
99. The on-line storage symbol would be used to represent:
- a. a deck of cards
 - b. a magnetic tape
 - c. an optical disk
 - d. a punched tape
- (easy, page 34, c)**
100. An annotation or comment may be represented in a flowchart using a:
- a. brace
 - b. flowline
 - c. square
 - d. diamond
- (easy, page 34, a)**

MATCHING QUESTIONS

101. Presented below is a list of terms relating to accounting information systems, followed by definitions of those terms.

Required: Match the letter next to each definition with the appropriate term. Each answer will be used only once.

(moderate, pages 54 through 55)

- _____ 1. On-line storage symbol
- _____ 2. Off-page connector symbol
- _____ 3. Manual input symbol
- _____ 4. Basic process symbol
- _____ 5. Decision symbol
- _____ 6. Off-line storage symbol
- _____ 7. Terminal symbol
- _____ 8. Basic input/output symbol
- _____ 9. Connector symbol
- _____ 10. Manual process symbol

- A. To indicate that a factory employee uses a workstation on the factory floor to key in a code that means that the production run has been completed
- B. To indicate that the treasurer will sign the payroll checks
- C. To indicate that a check is being mailed outside the company
- D. To indicate that a document is being sent to another department
- E. To indicate that the bank loan officer approves or does not approve of an increase in the customer's line of credit
- F. To indicate that computer software will calculate the employees' gross pay, deductions, and net pay
- G. To indicate a file of paper documents
- H. To indicate files stored on the hard disk
- I. To indicate the general ledger file
- J. To indicate the beginning or the end of the flowchart

Key:

- | | |
|------|-------|
| 1. H | 6. G |
| 2. C | 7. J |
| 3. A | 8. I |
| 4. F | 9. D |
| 5. E | 10. B |

102. Presented below is a list of terms relating to accounting information systems, followed by definitions of those terms.

Required: Match the letter next to each definition with the appropriate term. Each answer will be used only once.

(moderate, pages 54 through 55)

- | | |
|-------|--------------------------------|
| _____ | 1. Systems techniques |
| _____ | 2. Work measurement |
| _____ | 3. Decision table |
| _____ | 4. HIPO chart |
| _____ | 5. Data flow diagram |
| _____ | 6. Program flowchart |
| _____ | 7. Systems development project |
| _____ | 8. Compliance testing |
| _____ | 9. Substantive testing |
| _____ | 10. Sandwich rule |
-
- | | |
|----|--|
| A. | Consists of systems analysis, design, and implementation |
| B. | Charting technique used to document the logical design of a system |
| C. | Every process symbol should be placed between an input symbol and an output symbol |
| D. | Techniques used to measure activities in a production framework |
| E. | Tools used in the analysis, design, and documentation of systems |
| F. | Confirms the existence and assesses the effectiveness of internal controls |
| G. | Supplements or replaces flowcharts when there are a large number of alternative decision paths |
| H. | Indicates detailed processing functions |
| I. | A collection of IPO charts |
| J. | The direct verification of financial statement figures |

Key:

- | | |
|------|-------|
| 1. E | 6. H |
| 2. D | 7. A |
| 3. G | 8. F |
| 4. I | 9. J |
| 5. B | 10. C |

PROBLEMS

103. The following data is related to the time required to post checks drawn by the Last National Bank's depositors:

Number of checks posted	780
Total elapsed minutes	520
Rest period minutes	10
Interruption minutes	16

Required:

- Calculate the standard posting time per check.
- Calculate the combined rest and interruption time as a percentage of the standard time per check.

(difficult, pages 49 through 50)

Solution:

a. $\text{Standard time/check} = (520 + 10 + 16)/780$
 $= 0.70 \text{ min./check}$

b. $\text{Rest/interruption per check} = (10 + 16)/780$
 $= 0.033 \text{ min./check (rounded)}$

$\text{Rest/interruption percentage} = 0.033/0.70$
 $= 0.047 \text{ (rounded)} \times 100$
 $= 4.7\%$

104. The following data is related to the time required to post Kryptonite Corporation's daily general ledger entries:

Number of GL entries posted	844
Total elapsed minutes	320
Rest period minutes	5
Interruption minutes	7

Required:

- Calculate the standard posting time per GL entry.
- Calculate the combined rest and interruption time as a percentage of the standard time per GL entry.

(difficult, pages 49 through 50)

Solution:

- $\text{Standard time/entry} = (320 + 5 + 7)/844$
 $= 0.39 \text{ min./entry (rounded)}$
- $\text{Rest/interruption per entry} = (5 + 7)/844$
 $= 0.014 \text{ min./entry (rounded)}$

$$\begin{aligned}\text{Rest/interruption percentage} &= 0.014/0.39 \\ &= 0.0359 \text{ (rounded)} \times 100 \\ &= 3.59\%\end{aligned}$$

105.

Complete the limited-entry decision table below to document credit card purchase authorization procedures for The Whodunit Bookshop.
(moderate, pages 51 through 52)

A purchase under \$75 is approved automatically. Purchases between \$75 and \$500 (inclusive) are given an authorization number. For purchases over \$500, a hold is placed on the customer's account as well as an authorization number being assigned.

Condition/Action	Rules:		
	1	2	3
Purchase less than \$75			
Purchase between \$75 and \$500			
Purchase over \$500			
Approve with no action			
Assign authorization number			
Place hold on account			

Solution:

Condition/Action	Rules:		
	1	2	3
Purchase less than \$75	Y	N	N
Purchase between \$75 and \$500		Y	N
Purchase over \$500			Y
Approve with no action	x		
Assign authorization number		x	
Place hold on account			x

106. The approval policies for sales on account at Barton Brothers Lumber Company are given below:

A sale under \$1,000 is automatically approved for a builder or contractor. Sales between \$1,000 and \$5,000 (inclusive) require the approval of the credit department. Sales over \$5,000 require the approval of the credit department and the vice president of the company.

Required: Create a limited-entry decision table to document the sales department approval policies for Barton Brothers Lumber Company.
(difficult, pages 51 through 52)

Solution:

<u>Condition/Action</u>	Rules:		
	1	2	3
Sales less than \$1,000	Y	N	N
Sales between \$1,000 and \$5,000		Y	N
Sales over \$5,000			Y
Automatic approval	x		
Approval from credit dept.		x	
Approval from credit dept. & V.P.		x	x

ESSAYS

107. Name the four basic symbols used in analytic flowcharting, and briefly define them.
(moderate, pages 33 through 36)

Suggested answer:

Basic input/output symbol: Represents the making available of data for processing or the recording of processed information

Basic process symbol: Represents any kind of processing function

Flowline symbol: Used to link other symbols; indicates the sequence of available information and operation

Annotation symbol: Represents the addition of descriptive comments or explanations

108. Name the four basic symbols used in data flow diagrams, and briefly define them.
(moderate, pages 39 through 42)

Suggested answer:

Terminator	Represents sources and destinations of data
Process	Represents the task or function being done
Data store	Represents a repository (store, source) of data
Data flow	Represents a communication channel

109. Discuss one major characteristic of logical data flow diagrams which may be an advantage over analytic flowcharts in some situations.
(moderate, pages 39 and 42)

Suggested answer:

Logical data flow diagrams emphasize logical design rather than physical design. Some symbols used in analytic flowcharts emphasize data processing operations or physical media for inputs, storage, and outputs. Advocates of logical data flow design believe that such symbols confuse logical design with physical design. Some logical data flow diagrams emphasize processes rather than physical characteristics and are more suited to structured systems analysis.

110. One broad type of resource utilization analysis is work measurement.
- What fundamental assumption underlies work measurement?
 - What is an essential ingredient for an organization to be able to perform work measurement?
- (moderate, page 49 through 51)**

Suggested answer:

- The fundamental assumption is that quantitative measurement is essential to designing efficient work procedures.
- The essential ingredient is the existence of a standard, norm, or yardstick by which the procedure can be measured.

111. Describe the purpose and nature of the following types of flowcharts:
- Systems
 - Program or block
 - Analytic
 - Document
 - Forms distribution

(moderate, pages 39 and 42 through 44)

Suggested answer:

A systems flowchart identifies an organization's overall data flows. It shows the origination of inputs, processing (manual or automated), and the disposition of outputs. It emphasizes storage media and general processing rather than a detailed view of individual processes.

A program flowchart is a more detailed version of a systems flowchart. Each process in the systems flowchart is further detailed in the program flowchart. Program flowcharts are also known as block flowcharts.

Analytic flowcharts highlight the flow documents in significant processes, emphasizing processing tasks that apply controls. Symbols are connected with flowlines, as in the systems flowchart. The flowchart is separated into columns representing entities.

A document flowchart identifies the point of origination, distribution, and ultimate disposition of each document in the system. It does not emphasize processes, and is arranged by columns by entity as is the analytic flowchart. However, the primary (and many times only) symbol used is the document symbol.

The forms distribution chart emphasizes the distribution of multiple-copy forms in an organization, and it can be used to analyze unauthorized distribution, unnecessary copies, or unnecessary filing of copies. It is arranged in columns, with the form's originating department to the left and the departments receiving copies in columns to the right.

112. Discuss the main activities in each systems development phase: systems analysis, systems design, and systems implementation. Include two systems techniques in each phase. **(moderate, pages 32 through 33)**

Suggested answer:

Systems analysis includes activities to help formulate and evaluate solutions to systems problems. The systems analyst must first observe the system as it currently functions, and uses depth interviews, questionnaires, and documents reviews. The analyst organizes facts with work measurement analysis and work distribution analysis. To understand information flow, the analyst may prepare logical data flow diagrams and analytic flowcharts.

Systems design includes activities to evaluate the relative effectiveness and efficiency of design alternatives compared with the overall system requirements. Input/output analysis, systems flowcharting, and data flow diagrams help the designer understand and convey the completed system's concepts. This phase uses IPO and HIPO charts, program or block flowcharts, and branching and decision tables to document the design.

Systems implementation includes the activities to carry out the design plan and put it into operation. Systems techniques are used to document the completed system. The development team prepares program flowcharts and decision tables to help in training users and to assure that the systems design specifications are met.

113. How do systems techniques help in auditing? **(moderate, pages 31 through 33)**

Suggested answer:

Most auditing engagements are divided into two basic components: the interim audit and the financial statement audit. In an interim audit, auditors must first establish some degree of reliance on the organization's internal control structure. This is achieved through the use of compliance testing to confirm the existence, assess the effectiveness, and check the continuity of the operation of internal controls. The auditor must understand the internal controls that are selected for testing. Controls that are part of the organization's information system require an understanding of the technology employed in the system. To understand the technology and the basics of the information system, the auditor must make use of systems techniques used to document such a system.

Auditors must also document the results of the audit using working papers. Auditors document and analyze the content of working papers using various systems techniques. Internal control questionnaires, analytic flowcharts, and systems flowcharts help to provide excellent documentation for the evaluation of internal controls, and provide evidence of such audit evaluation in the working papers.

The financial statement audit of financial figures cannot be relied upon without the proper compliance testing and reliance upon the internal controls of the organization. Systems techniques form "building blocks" upon which the auditor can examine, assess, and place reliance upon controls used to ultimately prepare the financial statement audit.