### Chapter 11

## **Managing Knowledge**

#### **True-False Questions**

1.	Knowledge residing in the minds of employees that has not been documented is ca	lled
	explicit knowledge.	

Answer: False Difficulty: Medium Reference: p. 432

2. Knowledge can reside in e-mail, voice mail, graphics, and unstructured documents as well as structured documents.

Answer: True Difficulty: Easy Reference: p. 432

3. Knowledge is universally applicable and easily moved.

Answer: False Difficulty: Easy Reference: p. 433

4. The CIO is a senior executive who is responsible for the firm's knowledge management program.

Answer: False Difficulty: Easy Reference: p. 436

5. COPs are formal social networks of professionals and employees within and outside the firm who have similar work-related activities and interests.

Answer: False Difficulty: Medium Reference: p. 436

6. Structured knowledge is explicit knowledge that exists in informal documents.

Answer: False Difficulty: Easy Reference: p. 437–438

7. Semistructured information is all the knowledge in a firm that resides in the heads of experienced employees.

Answer: False Difficulty: Medium Reference: p. 438

8. Knowledge workers are primarily clerical and data workers who usually do not possess high levels of education.

Answer: False Difficulty: Easy Reference: p. 448

9. VRML is platform dependent, operates over a minicomputer, and requires large amounts of bandwidth.

Answer: False Difficulty: Medium Reference: p. 450

10. Expert systems are the primary tools used for knowledge discovery.

Answer: False Difficulty: Easy Reference: p. 451

11. Intelligent agents can discover underlying patterns, categories, and behaviors in large data sets

Answer: False Difficulty: Medium Reference: p. 460

12. Expert systems capture the knowledge of skilled employees in the form of a set of rules in a software system that can be used by others in the organization.

Answer: True Difficulty: Easy Reference: p. 452

13. Given their limitations, expert systems are seldom used for making discrete, highly structured decision-making situations.

Answer: False Difficulty: Medium Reference: p. 452

14. Expert systems work by applying a set of AND/OR rules against a knowledge base, both of which are extracted from human experts.

Answer: False Difficulty: Medium Reference: p. 455

15. Case-based reasoning is not well-suited for diagnostic systems in medicine.

Answer: False Difficulty: Easy Reference: p. 455

16. Fuzzy logic can describe a particular phenomenon or process linguistically and then represent that description in a small number of flexible rules.

Answer: True Difficulty: Medium Reference: p. 455

17. Fuzzy logic systems "learn" patterns from large quantities of data by sifting through data, searching for relationships, building models, and correcting over and over again the model's own mistakes.

Answer: False Difficulty: Medium Reference: p. 455–457

18. Because neural network applications cannot always explain why they arrive at a particular solution, they are not well suited for use in the medical profession.

Answer: False Difficulty: Medium Reference: p. 457–458

19. Intelligent agents are used only for specific, repetitive and predictable tasks.

Answer: False Difficulty: Medium Reference: p. 460

20. Shopping bots are a form of intelligent agent.

Answer: True Difficulty: Medium Reference: p. 460

#### **Multiple-Choice Questions**

21. Analysis

What capability of its new knowledge management system allowed Southern Company to experience greater productivity from its engineers?

- a. Knowledge repository
- b. Expertise location and management
- c. Intelligent techniques
- d. Learning management

Answer: a Difficulty: Medium Reference: p. 429–430

Analysis in terms of categorize

- 22. The percentage of Gross Domestic Product of the United States that is produced by the knowledge and information sectors is estimated to be:
  - a. 20 percent.
  - b. 40 percent.
  - c. 60 percent.
  - d. 80 percent.

Answer: c Difficulty: Hard Reference: p. 431

- 23. The flow of events or transactions captured by an organization's system describes:
  - a. information.
  - b. data.
  - c. wisdom.
  - d. knowledge.

Answer: b Difficulty: Easy Reference: p. 432

- 24. Expertise and experience of organizational members that has not been formally documented best describes:
  - a. wisdom.
  - b. information.
  - c. data.
  - d. tacit knowledge.

Answer: d Difficulty: Medium Reference: p. 432

**Difficulty: Easy** 

Reference: p. 436

CKO.

CEO.

Answer: c

d.

- 30. Informal social networks of professionals and employees within and outside the firm who have similar work-related activities and interests are called:
  - a. communities of practice.
  - b. communities of professionals.
  - c. communities of interest.
  - d. communities of knowledge.

Answer: a Difficulty: Medium Reference: p. 436

- 31. Which of the following are major types of knowledge management systems?
  - a. Management information systems, decision support systems, and transaction processing systems.
  - b. Enterprise systems, customer support systems, and supply chain management systems.
  - c. Database management systems, expert systems, and knowledge work systems.
  - d. Enterprise-wide knowledge management systems, knowledge work systems, and intelligent techniques.

Answer: d Difficulty: Hard Reference: p. 436

- 32. These are specialized systems built for engineers, scientists, and other knowledge workers charged with discovering and creating new knowledge for a company:
  - a. KWS
  - b. LMS
  - c. Wikis
  - d. CAD systems

Answer: a Difficulty: Easy Reference: p. 436

- 33. Fuzzy logic is a type of:
  - a. data mining.
  - b. neural network.
  - c. intelligent technique.
  - b. business intelligence.

Answer: c Difficulty: Easy Reference: p. 437

- 34. A system for organizing formal documents and reports in a repository where it can be accessed throughout the organization best describes:
  - a. database management system.
  - b. expert system.
  - c. structured knowledge system.
  - d. neural network.

Answer: c Difficulty: Medium Reference: p. 438

35.	Knowledge that already exists inside a firm in the form of formal reports or presentations categorized as:				r presentations is	
	b. se c. ta	ructured knowledge. mistructured knowled cit knowledge. nstructured knowledge				
	Answe	er: a	Difficulty:	Easy	Reference:	рр. 437–438
36.	A collection of internal and external knowledge in a single location for more efficient management and utilization by the organization is called a:					
	b. kr	WS. nowledge repository. ocument database. ocument management	system.		2	2,7
	Answe	er: b	Difficulty:	Medium	Reference:	p. 438
37.	What r	management-oriented o	challenge did	Stikeman Elliot fac	e in building	a successful KM
	<ul> <li>a. Ensuring that everyone in the branches had access to the same resources</li> <li>b. Freeing up partners from client work in order to populate the database</li> <li>c. Ensuring that junior employees used the KM system</li> <li>d. Persuading senior partners from hoarding their personal experience</li> </ul>					
	Answe	er: b	Difficulty:	Medium	Reference:	p. 442
38.		knowledge taxonomy cation.	is developed	l, documents are all		with the proper
	b. linc. tu	gged nked pled ferenced				
	Answe	er: a	Difficulty:	Medium	Reference:	p. 443
39.	Which of the following is a collaboration tool used to support knowledge management systems?					
,	b. W	logs Tikis Ocial bookmarking Il of the above				
	Answe	er: d	Difficulty:	Medium	Reference:	рр. 445–447

40.	As discussed in the Interactive Session: Technology, what is one of the drawbacks to using social bookmarking within a corporate knowledge management system?				
	<ul><li>a. Lack of standards in tax</li><li>b. Lack of integration with</li><li>c. Lack of ability to categ</li><li>d. Proliferation and duplic</li></ul>	n other products orize bookmarks			
	Answer: a	Difficulty: Medium	Reference: p. 446		
41.	Tools for the management, of learning best describes:	nt of various types of employee			
	<ul> <li>a. investment workstation</li> <li>b. organizational learning</li> <li>c. employee enrichment s</li> <li>d. learning management s</li> </ul>	system. ystem.	96,		
	Answer: d	Difficulty: Medium	Reference: p. 447		
42.	Most knowledge workers red	quire specialized knowledge wor	k systems, but they also rely on:		
	<ul><li>a. office systems.</li><li>b. schools and universities</li><li>c. imaging systems.</li><li>d. data transferring system</li></ul>				
	Answer: a	Difficulty: Medium	Reference: p. 448		
43.	<ul> <li>a. careful filing system</li> <li>b. financial analysis system</li> <li>c. CAD capability</li> <li>d. user-friendly interface</li> </ul>	is very important to a know	ledge worker's system.		
	Answer: d	Difficulty: Medium	Reference: p. 449		
44.	tasks to be performed.	often are designed an	d optimized for the specific		
	<ul><li>a. Graphics programs</li><li>b. Knowledge workstation</li><li>c. Virtual simulators</li><li>d. CAD stations</li></ul>	ns			
	Answer: b	Difficulty: Medium	Reference: p. 449		

#### 45. CAD/CAM workstations:

- a. provide engineers, designers, and factory managers with precise control over industrial design and manufacturing.
- b. provide an important source of expertise for organizations.
- c. allow groups to work together on documents.
- d. are high-end PCs used in the financial sector to analyze trading situations instantaneously and facilitate portfolio management.

Answer: a Difficulty: Medium Reference: p. 451

- 46. Which of the following would <u>not</u> be classified as a knowledge work system?
  - a. Computer-aided design
  - b. 3D visualization
  - c. Investment workstations
  - d. Case-based reasoning

Answer: d Difficulty: Hard Reference: pp. 449-451

- 47. Which of the following is a type of intelligent technique?
  - a. Knowledge networks
  - b. Case based reasoning
  - c. Computer-aided design
  - d. VRML

Answer: b Difficulty: Hard Reference: p. 451–461

- 48. Virtual reality applications for the Web use a standard called:
  - a. CADDIS
  - b. VRML
  - c. KWSVR
  - d. TCP/IP

Answer: b Difficulty: Medium Reference: p. 450

- 49. Virtual reality systems:
  - a. provide engineers, designers, and factory managers with precise control over industrial design and manufacturing.
  - b. provide an important source of expertise for organizations.
  - c. allow groups to work together on documents.
  - d. provide architects, engineers, and medical workers with precise, photorealistic simulations of objects.

Answer: d Difficulty: Medium Reference: p. 450

- 50. Investment workstations:
  - a. provide engineers, designers, and factory managers with precise control over industrial design and manufacturing.
  - b. provide an important source of expertise for organizations.
  - c. allow groups to work together on documents.
  - d. are high-end PCs used in the financial sector to analyze trading situations instantaneously and facilitate portfolio management.

Answer: d Difficulty: Easy Reference: p. 451

- 51. Which of the following is used for knowledge discovery?
  - a. Expert systems
  - b. Transaction processing systems
  - c. Case-based reasoning
  - d. Data mining

Answer: d Difficulty: Medium Reference: p. 451

- 52. Which of the following are not used to capture tacit knowledge?
  - a. Expert systems
  - b. Case-based reasoning
  - c. Fuzzy logic
  - d. Neural networks

Answer: d Difficulty: Hard Reference: p. 451

- 53. Technology that consists of computer-based systems that attempt to emulate human behavior is called:
  - a. fuzzy logic.
  - b. neural networks.
  - c. AI technology.
  - d. genetic algorithms.

Answer: c Difficulty: Medium Reference: p. 452

- 54. An inference engine is:
  - a. a strategy for searching the rule base in an expert system that begins with information entered by the user.
  - b. the programming environment of an expert system.
  - c. a method of organizing expert system knowledge into chunks.
  - d. a strategy used to search through the rule base in an expert system by forward chaining or backward chaining.

Answer: d Difficulty: Medium Reference: p. 452

- 55. Forward chaining is:
  - a. a strategy for searching the rule base in an expert system that begins with information entered by the user.
  - b. the programming environment of an expert system.
  - c. a method of organizing expert system knowledge into chunks.
  - d. a strategy for searching the rule base in an expert system that begins with a hypothesis.

Answer: a Difficulty: Medium Reference: p. 452

- 56. Backward chaining is:
  - a. a strategy for searching the rule base in an expert system that begins with information entered by the user.
  - b. the programming environment of an expert system.
  - c. a method of organizing expert system knowledge into chunks
  - d. a strategy for searching the rule base in an expert system that begins with a hypothesis.

Answer: d Difficulty: Medium Reference: p. 452

- 57. Which of the following is the expert system used by Countrywide Funding Corp. to make preliminary creditworthiness decisions on loan requests?
  - a. AskMe
  - b. EVAL
  - c. CLUES
  - d. CBR

Answer: c Difficulty: Hard Reference: p. 454

- 58. Expert systems:
  - a. solve problems too difficult for human experts.
  - b. are based on DO WHILE rules.
  - c. work in very limited domains.
  - d. share characteristics with mainframe computing.

Answer: c Difficulty: Medium Reference: p. 454

#### 59. Analysis

It is unlikely you could represent the knowledge in the *Encyclopedia Britannica* with an expert system because:

- a. there is no one expert who understands all the material contained within the encyclopedia.
- b. the knowledge changes radically over a short time.
- c. not all the knowledge in the encyclopedia can be represented in the form of IF-THEN rules.
- d. the knowledge is too general.

Answer: c Difficulty: Medium Reference: p. 454

Analysis in terms of appraise

- 60. Virtually all expert systems deal with problems of:
  - a. policy development.
  - b. classification.
  - c. logic and control.
  - d. high complexity.

Answer: b Difficulty: Hard Reference: p. 455

- 61. Expert systems are expensive and time-consuming to maintain:
  - a. because their rule base is so complex.
  - b. because they rely on equipment that becomes outdated.
  - c. because their rules must be reprogrammed every time there is a change in the environment, which in turn may change the applicable rules
  - d. because only the person who created the system knows exactly how it works, and may not be available when changes are needed.

Answer: c Difficulty: Hard Reference: p. 455

- 62. In this technique, descriptions of past experiences of human specialists are stored in a database for later retrieval when the user encounters a situation with similar characteristics.
  - a. CBR
  - b. Fuzzy logic
  - c. Data mining
  - d. LMS

Answer: a Difficulty: Easy Reference: p. 455

#### 63. Evaluation

You are an automotive engineer working on an application that will automatically parallel park a car. The intelligent technique you may find most useful is:

- a. case-based reasoning.
- b. artificial intelligence.
- c. fuzzy logic.
- d. expert system.

Answer: c Difficulty: Medium Reference: pp. 455-457

Evaluation in terms of choose

- 64. Hardware and software that attempts to emulate the processing patterns of the biological brain best describes:
  - a. neural network.
  - b. expert system.
  - c. case-based reasoning.
  - d. fuzzy logic.

Answer: a Difficulty: Medium Reference: p. 457

- 65. Genetic algorithms:
  - a. develop solutions to particular problems using fitness, crossover, and mutation.
  - b. represent knowledge as groups of characteristics.
  - c. do not work for most problems.
  - d. are based on logic.

Answer: a Difficulty: Medium Reference: p. 458–459

- 66. Which of the following describes a difference between neural networks and genetic algorithms?
  - a. Genetic algorithms are designed to process large amounts of information.
  - b. Genetic algorithms are a type of knowledge discovery, while neural networks are an intelligent technique.
  - c. Neural networks are programmed to "learn".
  - d. All of the above

Answer: c Difficulty: Hard Reference: pp. 457–459

- 67. Software programs that work in the background without direct human intervention to carry out specific, repetitive, and predictable tasks for individual users, business processes, or software applications, are called:
  - a. intelligent agents.
  - b. intelligent techniques.
  - c. business intelligence.
  - d. AI hybrid systems.

Answer: a Difficulty: Medium Reference: p. 460

- 68. What type of intelligent techniques helped Procter & Gamble determine the most efficient methods for their trucks to deliver goods?
  - a. Fuzzy logic
  - b. Intelligent agents
  - c. Genetic algorithms
  - d. None of the above

Answer: b Difficulty: Medium Reference: p. 460

69. Analysis

To automate routine tasks to help firms search for and filter information for use in electronic commerce and supply chain management a firm would most likely use:

- a. CAD systems.
- b. virtual reality systems.
- c. fuzzy logic systems.
- d. intelligent agents.

Answer: d Difficulty: Medium Reference: p. 460

Analysis in terms of categorize

70. Analysis

According to the case study, Boeing's decision to implement new knowledge management systems for its engineers was based on effecting what generic strategy to overcome market forces?

- a. Focus on market niche
- b. Strengthen customer and supplier intimacy
- c. Low-cost leadership
- d. Product differentiation

Answer: c Difficulty: Medium Reference: p. 466

Analysis in terms of categorize

#### Fill In the Blanks

71. <u>Wisdom</u> is thought to be the collective and individual experience of applying knowledge to the solution of problems.

Difficulty: Easy Reference: p. 432

72. <u>Structured knowledge</u> is explicit knowledge that exists in formal documents, as well as in formal rules that organizations derive by observing experts and their decision-making behaviors.

Difficulty: Easy Reference: pp. 437–438

73. Knowledge network systems are also known as expertise location and management systems.

Difficulty: Medium Reference: p. 439

74. A *taxonomy* is a scheme for classifying information and knowledge in such a way that it can be easily accessed.

Difficulty: Medium Reference: p. 443

75. A *learning management system (LMS)* provides tools for the management, delivery, tracking, and assessment of various types of employee learning and training.

Difficulty: Medium Reference: p. 447

76. <u>Computer aided design (CAD)</u> automates the creation and revision of designs, using computers and sophisticated graphics software.

Difficulty: Easy Reference: p. 449

77. The model of human knowledge used by expert systems is called the *knowledge base*.

Difficulty: Easy Reference: p. 452

78. The strategy used to search through the rule base is called the *inference engine*.

Difficulty: Easy Reference: p. 452

79. A(n) <u>knowledge engineer</u> is similar to a traditional systems analysts but has special expertise in eliciting information and expertise from other professionals.

Difficulty: Easy Reference: p. 454

80. Systems that integrate genetic algorithms, fuzzy logic, neural networks, and expert systems are called *hybrid AI systems*.

Difficulty: Medium Reference: p. 460

#### **Essay Questions**

#### 81. Evaluate

What is knowledge management? What types of knowledge might a company such as a taxi service have, and could a taxi service benefit from knowledge management?

Knowledge management is the set of processes developed in an organization to create, gather, store, disseminate, and apply the firm's knowledge. A taxi company's knowledge might include explicit knowledge, such as maps and routes between destinations. Tacit knowledge would include the experience of drivers, such as the best alternate routes between destinations or passenger needs. A taxi service might benefit from a system that gave drivers guides on routes that included alternate routes drivers had found. It might benefit from a learning management system that trained drivers for locations, destinations, and alternate routes.

Difficulty: Easy Reference: p. 434

Evaluate in terms of appraise

#### 82. Synthesis

Briefly outline the knowledge management chain as it might apply to the online catalog system of a public library.

Steps in the knowledge management chain include:

- **Acquisition.** For an online catalog of a library this would be getting the book data into digital format.
- Storage. This would involve the systems for storing this data, perhaps a central server.
- **Dissemination.** The library would need to determine how the card catalog information is accessed by the public or by staff.
- **Application.** This would involve the card catalog becoming part of the library's business processes. For example, the card catalog would be linked to a system of borrowing, so that users would know from the card catalog whether a book was out on loan.
- Management and organizational activities. This would entail using the system with a
  card catalog base for other services, perhaps linking up to a wider library system to
  share resources, information, or book loaning between systems.

Difficulty: Medium Reference: p. 434

Synthesis in terms of model

## 83. Identify the three major types of knowledge management systems. Provide two examples of each.

The major types of knowledge management systems are enterprise knowledge management systems, knowledge work systems, and intelligent techniques.

Enterprise knowledge management systems include: Structured knowledge systems, semistructured knowledge systems, learning management systems, and knowledge networks.

Knowledge work systems include: Computer-aided design systems, virtual reality systems, and financial investment workstations.

Intelligent techniques include: Data mining, expert systems, case-based reasoning, fuzzy logic, neural networks, genetic algorithms, hybrid AI systems, and intelligent agents.

Difficulty: Easy Reference: pp. 437–460

# 84. How can knowledge be gathered from the personal and undocumented expertise of professionals within a firm? List at least four ways to gather and disseminate such knowledge.

The experience of firm employees can be gathered by documenting their experience through documenting best practices and frequently asked questions. You can also develop a referral system by providing a way for employees to find a company expert for the solution they are looking for. There is commercially available software for enterprise-wide knowledge network system, but other tools you can use include best-practices documents, FAQs, social bookmarking, collaboration tools, wikis, and blogs for helping gather and disseminate tacit knowledge.

Difficulty: Medium Reference: pp. 444–445

#### 85. Evaluation

Why are knowledge workers so important to the digital firm? What are their functions and which of these do you feel is most critical to the success of the firm? Why?

Student answers will vary, but should include an understanding of the three main functions of knowledge workers. An example answer is:

Knowledge workers create new products or find ways to improve existing ones. Without them, the firm would stagnate and become less competitive in an environment that is always changing and is increasingly more competitive. In the modern economy, knowledge is truly power. The three major functions of knowledge workers are: keeping the organization up-to-date in knowledge as it develops in the external world; serving as internal consultants regarding their areas of knowledge and its opportunities; and acting as change agents as they evaluate, initiate, and promote new projects. The most important of these is to develop new knowledge as it applies to the making of products or services, as offering products and services is the mainstay of the corporation.

Difficulty: Medium Reference: p. 448

Evaluation in terms of judge

#### 86. Identify three important qualities or capabilities of knowledge work systems.

Knowledge work systems must give knowledge workers the specialized tools they need, such as powerful graphics, analytical tools, and communications and document-management tools. Knowledge work systems must provide a user-friendly interface to the KWS. These user-friendly interfaces save time by allowing the user to perform needed tasks and get to required information without having to spend a lot of time learning to use the computer.

Knowledge work systems must be carefully designed to optimize the performance of the specific tasks of the pertinent knowledge worker.

Difficulty: Medium Reference: pp. 448–449

## 87. Discuss the concept of virtual reality, especially with regard to VRML and its applications in the business arena.

Virtual reality systems use interactive graphics software and hardware to create the illusion of reality in cyberspace. The original applications were in gaming, but new uses in education, science, and business are being developed and have great promise. Virtual reality applications are being developed for the Web using a standard called Virtual Reality Modeling Language (VRML), which can organize multiple media types to put users in a simulated real-world environment. VRML is platform independent, operates over a desktop computer, and requires little bandwidth. DuPont's HyperPlant is an example of a business application. HyperPlant allows users to go through three-dimensional models as if they were physically walking through a plant, which reduces errors during the construction of manufacturing structures.

Difficulty: Medium Reference: p. 450

#### 88. Synthesis

What is the difference between a neural network, fuzzy logic, and genetic algorithms? Which would be most useful to an organization of astronomers analyzing gamma ray emissions reaching Earth?

A neural network attempts to emulate the processing patterns of the biological brain. The results are a program that can "learn" by comparing solutions to known problems to sets of data presented to it. Neural networks are used for solving complex, poorly understood problems for which large amounts of data have been collected. Fuzzy logic creates rules that use approximate or subjective values. It describes a particular phenomenon or process linguistically and then represents that logic in a small number of flexible rules. Genetic algorithms are problem-solving methods that use the model of living organisms adapting to their environment. Possible solutions are evaluated, the "best" choices are made, then more possible solutions are created by combining the factors involved in those first "best" choices, and choosing again. The process continues until an optimum solution is reached. These genetic algorithms are useful for finding the optimal solution for a specific problem by examining a very large number of alternative solutions for that problem.

I think a neural network would be of most use, because of its ability to analyze large amounts of data and find hidden relationships.

Difficulty: Hard Reference: p. 344–348

Synthesis in terms of formulate, propose

#### 89. Evaluation

#### What do you see as the challenges in setting up a knowledge management system?

Determining what knowledge will be the most effective or offer the most benefits to the company; defining taxonomies, gathering accurate knowledge, quantifying the system's success, change management and implementing business processes that incorporate the system.

Difficulty: Hard Reference: pp. 429–468

Evaluation in terms of appraise, assess

#### 90. Evaluation

You have been hired by a small architectural firm interested in implementing a knowledge management system. What features do you think would be of most benefit to them?

The ability to store structured documents, such as plans, blueprints; collaboration tools, the ability to reference up-to-date local or national building codes, a system for storing case studies, best practices, and corporate standards.

Difficulty: Hard Reference: pp. 349–356

Evaluation in terms of appraise, assess