

CHAPTER 2: LOGISTICS AND INFORMATION TECHNOLOGY

Multiple Choice Questions (correct answers are bolded)

1. Which of the following is not a benefit to utilizing information in logistics?
 - a. greater knowledge and visibility across the supply chain
 - b. greater awareness of customer demand via point-of-sale data
 - c. better coordination of manufacturing, merchandising, and distribution through ERP tools
 - d. more streamlined order processing and reduced lead time
 - e. **all of the above are benefits**
2. How do data and information differ?
 - a. data are a body of facts in a format suitable for decision making, while information is simply facts
 - b. they are the same
 - c. **data are simply facts; information is a body of facts in a format suitable for decision making**
 - d. data are associated with decision support systems; information is associated with ERP systems
3. ____ refers to the collection of large amounts of near-real-time data collected through a variety of sources such as sensors and smart phones, among others.
 - a. cloud computing
 - b. **big data**
 - c. data warehousing
 - d. decision support systems
4. ____ provide effective ways to process organizational business data, to perform calculations, and to create documents.
 - a. enterprise resource planning systems
 - b. transaction processing systems
 - c. decision support systems
 - d. **office automation systems**
5. The most relevant general software package for logisticians is _____.
 - a. **spreadsheets**
 - b. word processing
 - c. presentation packages
 - d. email

6. Which of the following is not considered a general software package?
- a. spreadsheets
 - b. presentation packages
 - c. word processing
 - d. database management
 - e. **all are general software packages**
7. ____ help various stakeholders—employers, suppliers, customers—work together by interacting and sharing information in many different forms.
- a. decision support systems
 - b. **communication systems**
 - c. office automation systems
 - d. transaction processing systems
8. What has emerged as the measuring stock for logistics information technology in the 21st century?
- a. Facebook
 - b. the Internet
 - c. **wireless communication**
 - d. enterprise resource planning systems
9. ____ refers to a network of satellites that transmits signals that pinpoint the exact location of an object.
- a. **global positioning systems**
 - b. geographic information systems
 - c. the National Security Agency
 - d. electronic data interchange
10. Electronic data interchange represents what general type of information management system?
- a. communication system
 - b. **transaction processing system**
 - c. decision support system
 - d. office automation system
11. ____ refers to the computer-to-computer transmission of business data in a structured format.

- a. big data
 - b. enterprise resource planning systems
 - c. **electronic data interchange**
 - d. data mining
12. Which of the following statements about EDI is not true?
- a. EDI can have high setup costs
 - b. **EDI can result in increased inventory carrying costs**
 - c. EDI can lead to increased billing accuracy
 - d. the Internet is likely a complement to, rather than substitute for, EDI
13. Automatic identification systems are an essential component in ____.
- a. every warehouse
 - b. **point-of-sale systems**
 - c. a logistics information system
 - d. dual distribution
14. The most popular automatic identification system currently in use is ____
- a. voice-data entry
 - b. radio-frequency identification
 - c. magnetic strips
 - d. **bar code scanners**
15. Which of the following statements about radio-frequency identification (RFID) is false?
- a. **RFID only offers read capabilities**
 - b. Walmart has been a major catalyst for RFID usage in logistics
 - c. RFID can store large quantities of data
 - d. RFID has helped to reduce the occurrence of inventory stockouts
 - e. all of the above are true
16. A logistics information system begins with:
- a. **a logistics manager requesting information**
 - b. a good computer system
 - c. lots of money
 - d. a customer order
17. All of the following statements about logistics information systems are true, except:
- a. “timely” can refer to the up-to-date status of information

- b. **internal sources of logistics information are relatively plentiful**
 - c. “timely” can refer to how quickly a manager receives requested information
 - d. a LIS must be concerned with the nature and quality of data
 - e. all of the above are true
18. The primary advantage of ____ is that enables a firm to test the feasibility of proposed changes at relatively little expense.
- a. data mining
 - b. expert systems
 - c. **simulation**
 - d. artificial intelligence
19. Which of the following is not a logistics-related decision support system?
- a. simulation
 - b. application-specific software
 - c. transportation management systems
 - d. **electronic data interchange**
 - e. all of the above are logistics-related decision support systems
20. Warehouse management systems represent an example of what general type of information management system?
- a. communication system
 - b. transaction processing system
 - c. **decision support system**
 - d. office automation system
21. Which of the following is not a potential benefit of transportation management systems?
- a. **fewer stockouts**
 - b. reduced fuel consumption
 - c. decreased empty vehicle miles
 - d. reduced transportation expenditures
 - e. all of the above are benefits
22. ____ refers to the application of mathematical tools to large bodies of data in order to extract correlations and rules.
- a. fuzzy logic
 - b. factor analysis
 - c. **data mining**
 - d. linear regression

23. Efficient data mining is dependent upon ____.
- a. good forecasting tools
 - b. top management commitment
 - c. high-speed technology
 - d. **data warehouses**
24. ____ create and maintain consistent data processing methods and an integrated database across multiple business functions.
- a. logistics information systems
 - b. **enterprise systems**
 - c. decision support systems
 - d. transaction processing systems
25. The origins of contemporary ERP systems can be traced back to logistics and ____.
- a. **manufacturing**
 - b. marketing
 - c. purchasing
 - d. finance
26. Which of the following statement about ERP is false?
- a. In recent years, ERP vendors have begun to provide high-quality application-specific logistic capabilities
 - b. ERP implementation costs can easily reach tens of millions of dollars
 - c. **ERP's origins can be traced back to finance and manufacturing**
 - d. ERP glitches often have a logistical component to them
 - e. all of the above are true
27. All of the following are potential costs associated with ERP implementation, except:
- a. employee training
 - b. system testing
 - c. data conversion
 - d. upgraded computer hardware
 - e. **all of the above are costs**
28. Approximately ____ percent of the world's population currently uses the Internet.
- a. 45
 - b. **35**
 - c. 25
 - d. 15

29. The return rates for online purchases is approximately ____ percent
- a. 20
 - b. 25
 - c. **30**
 - d. 35
 - e. none of the above
30. Which of the following statements is false?
- a. orders associated with online retailing tend to be for smaller quantities than in-store retailing
 - b. online retailing is characterized by open-case, rather than full-case, picking
 - c. online retailers are challenged by last-mile considerations
 - d. **online retailing and in-store retailing experience similar rates of product return**
31. The worldwide public cloud services market grew by approximately ____ percent between 2011 and 2012?
- a. **20**
 - b. 15
 - c. 10
 - d. 5
32. What has emerged as the most popular application of on-demand logistics software (cloud computing)?
- a. warehouse management systems
 - b. **transportation management systems**
 - c. inventory optimization
 - d. collaborative forecasting
33. Which of the following is not a type of benefits that comes from electronic procurement?
- a. transactional benefits
 - b. management information benefits
 - c. compliance benefits
 - d. **production benefits**
 - e. all of the above are benefits
34. In a reverse auction, ____.
- a. multiple sellers invite bids from multiple buyers

- b. one buyer invites bids from one seller
 - c. **one buyer invites bids from multiple sellers**
 - d. multiple sellers invite bids from one buyer
35. ____ has been identified as the biggest information technology challenge that companies face today.
- a. software viruses
 - b. information security
 - c. **the cost of technology**
 - d. employee resistance

True-False Questions

1. The effective and efficient use of information allows organizations to either reduce costs or improve customer satisfaction. (False)
2. “Data” and “information” are synonymous terms. (False)
3. Big data refers to large amounts of near-real-time data collected through a variety of sources such as sensors and smart phones, among others. (True)
4. Office automation systems provide effective ways to process personal and organizational business data, to perform calculations, and to create documents. (True)
5. A transaction processing system helps people work together by interacting and sharing information in many different forms. (False)
6. The Internet has emerged as the measuring stick for logistics information technology during the first decade of the 21st century. (False)
7. Transportation companies that have implemented global positioning systems have reported increased worker productivity, reduced operating costs, and improved customer relations. (True)
8. Global positioning implementations often pay for themselves within six months. (False)
9. EDI is an example of a logistics-related transaction processing system. (True)
10. EDI is no longer an important logistics technology in the 21st century. (False)
11. The idea behind point-of-sale systems is to provide data to guide and enhance managerial decision making. (True)

12. Radio-frequency identification is the most popular automatic identification system currently in use. (False)
13. One prominent drawback to radio-frequency identification (RFID) involves privacy concerns. (True)
14. A logistics information system begins with a logistics manager requesting information and ends with the manager receiving regular and customized reports. (True)
15. Internal sources of logistics information are not always as plentiful as might be desired. (True)
16. “Timely” information can refer to its nature and quality. (False)
17. The primary advantage of simulation is that it enables a firm to test the feasibility of proposed changes at relatively little expense. (True)
18. Application-specific software is a type of decision support system. (True)
19. One benefit to transportation management systems is fewer stockouts. (False)
20. Activities that can be controlled by a warehouse management system include inventory management, determination of storage locations, and order shipping. (True)
21. Correlation analysis uses sophisticated quantitative techniques to find “hidden” patterns in large volumes of data. (False)
22. Wal-Mart and its vendors make extensive use of data mining to improve supply chain efficiency and effectiveness. (True)
23. The attractiveness of ERP systems comes from their potential for lower costs as well as increased productivity and customer satisfaction. (True)
24. The origin of ERP systems can be traced back to finance and manufacturing. (False)
25. There are suggestions that consultant fees for ERP implementations may be three times as costly as the software itself. (True)
26. A general rule of thumb is that the actual time to implement an ERP system may range from 1 ½ to 2 times longer than the time period specified by the ERP vendor. (False)
27. In recent years, ERP vendors have begun to provide high-quality application-specific logistical capabilities. (True)
28. About 25 percent of the world’s population currently uses the Internet. (False)

29. There are few logistical similarities between online and in-store retailing. (False)
30. The smaller order quantities occasioned by online retailing tend to favor transport companies with extensive delivery networks and expertise in parcel shipments. (True)
31. The return rates associated with e-commerce are quite similar to those associated with other kinds of retailing. (False)
32. The worldwide public market for cloud computing grew nearly 20 percent between 2011 and 2012. (True)
33. One reason for the popularity of on-demand software is that its pay-per use formula allows customers to avoid high capital investment costs. (True)
34. Cloud-based software allows for a great deal of customization. (False)
35. The Internet is the primary transaction medium for cloud-based software. (True)
36. Electronic procurement uses the Internet to make it easier, faster, and less expensive for an organization to purchase goods and services. (True)
37. In a reverse auction, one seller invites bids from multiple buyers. (False)
38. Information technology should be regarded as a tool to help managers address organizational problems. (True)
39. Software viruses are viewed as the most important information technology issue that companies face today. (False)
40. People-related factors such as employee resistance have been identified as a major cause of information technology implementation failure. (True)

PART IV CASE SOLUTIONS

CASE 2-1 JUST-IN-TIME IN KALAMAZOO

Question 1: What is the total annual cost of maintaining the components inventory under the present system?

Current system

Item	Average distance from vendor (in miles)	Number of units used each week	Current lot size purchased	Unit cost	Average freight cost per unit
Gas range	1,145	10	200	\$100	\$20
Toilet	606	10	240	\$80	\$18
Pump	26	56	125	\$16	\$3
Refrigerator (large)	22	6	120	\$110	\$20
Refrigerator (small)	22	7	15	\$95	\$15
Foam cushion	490	675	1,500	\$8	\$2
CB radio (type D)	1,800	9	24	\$136	\$11
Dome lights	3	824	1,720	\$2	None
Awning bracket	48	540	1,200	\$4	\$1
Insect screen	159	570	1,240	\$7	\$1

Current system (continued)

Item	Safety stock	Average inventory	Total inventory	Inventory cost	Inventory carrying charges	Inventory maintenance cost
Gas range	40	100	140	\$62,400	\$3,360	\$65,760
Toilet	40	120	160	\$50,960	\$3,136	\$54,096
Pump	56	63	119	\$55,328	\$450	\$55,778
Refrigerator (large)	6	60	66	\$40,560	\$1,716	\$42,276
Refrigerator (small)	7	8	15	\$40,040	\$319	\$40,359
Foam cushion	1,350	750	2,100	\$351,000	\$4,200	\$355,200
CB radio (type D)	36	12	48	\$68,796	\$1,411	\$70,207
Dome lights	824	860	1,684	\$85,696	\$674	\$86,370
Awning bracket	540	600	1,140	\$140,400	\$1,140	\$141,540
Insect screen	1,140	620	1,760	\$237,120	\$2,816	\$239,936

Total inventory maintenance cost per year = \$1,151,522

Using JIT

Item	JIT lot size	Unit cost	Average freight cost per unit (surface)	Inventory maintenance cost
Gas range	10	\$105	\$22	\$66,040
Toilet	10	\$100	\$18	\$61,360
Pump	7	\$15	\$4	\$55,328
Refrigerator (large)	6	\$113	\$25	\$43,056
Refrigerator (small)	1	\$85	\$15	\$36,400
Foam cushion	75	\$7	\$3	\$351,000
CB radio (type D)	3	\$130	\$26	\$73,008
Dome lights	36	\$4	None	\$171,392
Awning bracket	60	\$5	\$1	\$168,480
Insect screen	50	\$7	\$2	\$266,760

Total inventory maintenance cost per year = \$1,292,824.00

The table in this case is a 10% sample of the firm's inventory and reflects the inputs needed for one week's activities. We must calculate the average stock on hand for each item (safety stock + $\frac{1}{2}$ order lot size), and must calculate the cost per item (unit cost plus freight). For the first item—gas ranges—a safety stock of 40 units is maintained, and $\frac{1}{2}$ the order lot size is 100 units, for a total inventory in stock of 140 units. Unit cost (\$100) plus freight (\$20) equals \$120. Multiplying average inventory (140) times \$120 equals \$16,800. Doing all the items on table gives a total of \$96,175. Because this is a 10% sample, the total parts inventory would be worth \$961,750. Inventory carrying costs on this, at 20% per year, would be \$192,350.

Question 2: What would be the total annual cost of maintaining the components inventory under the JIT system (assuming no safety stocks)?

One would look at the average number used per week, but apply the new, usually higher unit costs and freight charges. For one week's activity shown on the table, the new cost would be \$24,862 per week (compared with about \$21,818 under the existing system). Hence the cost of the JIT system is higher.

Question 3: Should Ballenger take into account any other costs or benefits from the JIT system? If so, what are they?

Under a JIT system, Ballenger should exhibit less concern with various problems associated with maintaining a large inventory such as shrinkage and obsolescence.

Question 4: If the JIT system is adopted, are there safety stocks of any item that should be maintained? If so, which ones, and how much?

Unfortunately, the case does not provide sufficient information to answer this question. Parts that are crucial to the process would need to be indicated by management, or perhaps work-flow process charts.

Question 5: If the JIT system is adopted, what changes, if any, should occur in the relationships between Ballenger's firm and his suppliers of components? Discuss.

He would need better discipline in terms of prompt delivery and freedom from defects.

Question 6: Assume that Ballenger has switched to the JIT system and that he receives a surprise phone call from a competitor who is going out of business. The competitor wants to sell Ballenger 7,000 dome lights of the type listed on Exhibit 3-C. Should Ballenger buy them? If so, at what price?

Probably not, because this would undermine the discipline envisioned by the JIT system. On the other hand, if the purchase price was very low, and there were no unique storage requirements, Ballenger might buy them.

Question 7: Carrying costs are 20%. Is there a level of carrying costs at which both Ballenger's present system and a JIT system have similar costs? If so, what is it?

Using a basic spreadsheet package, we found that at the astronomical rate of **167%**, the two systems were equal.

DISCUSSION

This is a difficult case although it can be approached in several ways. One must calculate the average costs of all the goods, as they are used each week, plus a figure for inventory carrying costs.