

Chapter 2: The Development of Enterprise Resource Planning Systems

TRUE/FALSE

1. The complex hardware and software that goes into an ERP system was not available until the 1970s.

ANS: F PTS: 1 REF: 19

2. The capabilities of computer hardware doubling every 18 months is known as Gates' Law.

ANS: F PTS: 1 REF: 19

3. Scalability refers to a piece of equipment's capacity being exceeded and that capacity being expanded by adding new hardware.

ANS: T PTS: 1 REF: 20

4. The software that holds data in an organized fashion is known as a database management system, or a DBMS.

ANS: T PTS: 1 REF: 20

5. Materials requirements planning (MRP) software allows a plant manager to plan production and raw materials requirements by guess-timation.

ANS: F PTS: 1 REF: 20

6. The direct computer-to-computer exchange of standard business documents is known as EDI, or electronic data interchange.

ANS: T PTS: 1 REF: 21

7. The functional model of business and management was useful for decades and is still the current school of thought.

ANS: F PTS: 1 REF: 22

8. SAP's first software project involved developing a materials and logistics management system for ICI.

ANS: T PTS: 1 REF: 24

9. SAP expanded into international markets but kept the software in a single language, German, and a single currency, the Euro.

ANS: F PTS: 1 REF: 33

10. SAP's R/3 can only run on mainframe computers.

ANS: F PTS: 1 REF: 24

11. Old systems are known as legacy systems.

ANS: T PTS: 1 REF: 25

12. Open architecture is defined as allowing third-party software vendors to write software to integrate with the main package, such as SAP's R/3.

ANS: T PTS: 1 REF: 24

13. The Oracle corporation began selling ERP software; they recently acquired a firm known for its database management systems.

ANS: F PTS: 1 REF: 26

14. Defining the dollar limits on transactions in the SAP R/3 system is known as limiting the tolerance groups.

ANS: T PTS: 1 REF: 30

15. R/3's design incorporates best practices, which means the designers have chosen the best, most efficient way in which a business process should be handled.

ANS: T PTS: 1 REF: 31

16. One benefit of ERP systems is the elimination of updating and repairing many separate computer systems.

ANS: T PTS: 1 REF: 33

17. A large company might spent \$1 million on ERP implementation, which includes software and training.

ANS: F PTS: 1 REF: 34

18. Not every company is suited to ERP systems.

ANS: T PTS: 1 REF: 34

19. SAP's internal programming language is visual basic.

ANS: F PTS: 1 REF: 35

20. The return on investment (ROI) is an assessment of an investment's project's value that is calculated by dividing the value of the project's benefits by the value of the project's cost.

ANS: T PTS: 1 REF: 36

21. In the following figure, data is entered into the system once and then used throughout the organization.

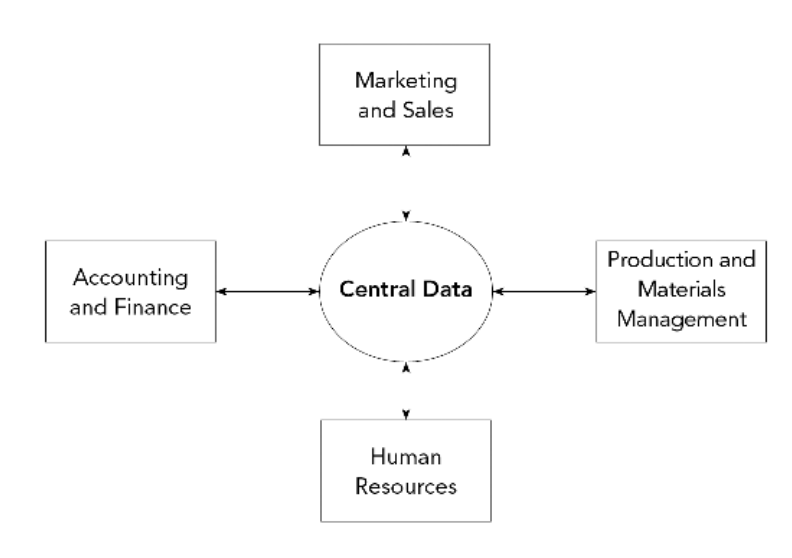


FIGURE 2-4 Data flow within an integrated information system

ANS: T PTS: 1 REF: 26

22. Individual information systems for each functional area in a company are known as silos.

ANS: T PTS: 1 REF: 18

23. Silos of information are also known as stovepipes.

ANS: T PTS: 1 REF: 18

24. The most current version of SAP's software is known as R/3.

ANS: F PTS: 1 REF: 26

25. The most current version of SAP's software is known as SAP ERP.

ANS: T PTS: 1 REF: 26

MULTIPLE CHOICE

1. The complex software and hardware required for ERP systems was not available until the
- a. 1960s
 - b. 1970s
 - c. 1980s
 - d. 1990s

ANS: D PTS: 1 REF: 19

2. The observation that the number of transistors built onto a computer chip doubles every 18 months is known as:
- a. Moore's Law
 - b. Gate's Prophecy
 - c. Doubling
 - d. Acceleration

ANS: A PTS: 1 REF: 19

3. When a piece of equipment's capacity is exceeded, its capacity can be increased by adding new hardware. This is commonly known as:

- a. Adaptability
- b. Middleware
- c. Scalability
- d. Computability

ANS: C PTS: 1 REF: 20

4. In the 1980s, ____, the technology that holds data in an organized fashion, existed for ERP development.

- a. Spreadsheets
- b. DBMS
- c. Client/Server
- d. Word-processors

ANS: B PTS: 1 REF: 20

5. ____ software allows a plant manager to plan production and raw materials requirements by working backward from the sales forecast.

- a. DBMS
- b. EDI
- c. MRP
- d. EFT

ANS: C PTS: 1 REF: 20

6. The direct computer-to-computer exchange of standard business documents is known as:

- a. MRP
- b. E-mail
- c. EDI
- d. DDS

ANS: C PTS: 1 REF: 21

7. Software ____ are individual programs that can be purchased, installed, and run separately, but extract data from the common database.

- a. Nodes
- b. Chunks
- c. Modules
- d. Tidbits

ANS: C PTS: 1 REF: 24

8. When third party software companies are able to write software to integrate with an ERP system, it is said to have:

- a. Open architecture
- b. Clip-ons
- c. Integrated pieces
- d. Piecemeal nodes

ANS: A PTS: 1 REF: 24

9. Old information and computer systems are known as:

- a. Dinosaurs
- b. Passe systems
- c. Legacy systems
- d. Aged ones

ANS: C PTS: 1 REF: 25

10. ____ is SAP's biggest competitor.

- a. J.D. Edwards
- b. PeopleSoft
- c. Microsoft
- d. Oracle

ANS: D PTS: 1 REF: 26

11. Which R/3 module records sales orders?

- a. SD
- b. MM
- c. PP
- d. QM

ANS: A PTS: 1 REF: 27

12. Which R/3 module records transactions in the general ledger?

- a. CO
- b. WF
- c. FI
- d. PS

ANS: C PTS: 1 REF: 29

13. After a company chooses the modules they want to implement, they must decide on about ____ options, which allow the customer to customize the modules to fit their business to some extent.

- a. Settings
- b. Configuration
- c. Optional
- d. Tandem

ANS: B PTS: 1 REF: 30

14. Which of the following is a benefit to running an ERP system?

- a. Global integration
- b. Elimination of updating and repairing multiple systems
- c. Capability to manage operations, not just monitor them
- d. All of the above are benefits

ANS: D PTS: 1 REF: 33

15. An ERP system for a large company will cost ____, including software, training, and implementation.

- a. \$50-500 million
- b. \$1-5 million
- c. \$1-5 billion
- d. \$50,000-\$500,000

ANS: A PTS: 1 REF: 34

16. SAP's internal programming language is called:

- a. R/3
- b. C++
- c. Visual Basic
- d. ABAP

ANS: D PTS: 1 REF: 35

17. One assessment of a project's value is calculated by the:

- a. DVT
- b. PMT
- c. ROI
- d. PPT

ANS: C PTS: 1 REF: 36

18. Bumpy rollouts of ERP systems are usually caused by:

- a. Software problems
- b. People problems
- c. Hardware problems
- d. Configuration problems

ANS: B PTS: 1 REF: 37

19. The statistical and logical analysis of large sets of transaction data is called:

- a. Digging
- b. Hunting
- c. Data mining
- d. Hacking

ANS: C PTS: 1 REF: 41

20. ____ is the conducting of business over the Internet.

- a. R/3
- b. ABAP
- c. E-Commerce
- d. SCM

ANS: C PTS: 1 REF: 41

21. Tolerance groups can be set in the SAP system as shown below. A tolerance setting is an example of one of the many _____ settings in the SAP system.

Change View "FI Tolerance Groups For Users": Details

Group:
Company code: FS Fitter Snacker Kalamazoo
Currency: USD

Upper limits for posting procedures

Amount per document	10,000.00
Amount per open item account item	10,000.00
Cash discount per line item	5.000 %

Permitted payment differences

	Amount	Percent	Cash discnt adj.to
Revenue	100.00	5.0 %	100.00
Expense	100.00	5.0 %	100.00

FIGURE 2-6 A customization example: tolerance groups to set transaction limits

- a. Running
b. Switch
c. Configuration
d. Programming

ANS: C PTS: 1 REF: 30

22. Individual information systems for each functional area in a company are known as

- a. Silos
b. Bagpipes
c. Tubers
d. Separated systems

ANS: A PTS: 1 REF: 18

23. Which ERP package is a popular software choice for managing human resources and financial activities at universities?

- a. SAP
b. PeopleSoft
c. Microsoft Dynamics
d. J.D. Edwards

ANS: B PTS: 1 REF: 25

24. Which of the following modules in SAP ERP maintains production information.

- a. SD
b. MM
c. PP
d. QM

ANS: C PTS: 1 REF: 27

25. Which of the following module in SAP is a set of tools that can automate the activities in SAP ERP?

- a. Workflow
b. Controlling
c. Financial Accounting
d. Project System

ANS: A PTS: 1 REF: 29

26. What are software that enables systems to exchange data without complicated software links?

- a. ABAP modules
b. Web Services
c. Legacy systems
d. Best practices

ANS: B PTS: 1 REF: 42

COMPLETION

1. _____ states that the number of transistors on a computer chip doubles every 18 months.

ANS: Moore's Law

PTS: 1 REF: 19

2. When the network's capacity can be expanded by the addition of a server, it's called _____.

ANS:
Scalable
Scalability

PTS: 1 REF: 20

3. The technology to hold data in an organized fashion, and to retrieve that data easily, is the _____.

ANS:
database management system
DBMS

PTS: 1 REF: 20

4. _____ software allows a plant manager to plan production and raw materials requirements by working backward from the sales forecast.

ANS: MRP

PTS: 1 REF: 20

5. The prediction of future sales is the _____.

ANS: sales forecast

PTS: 1 REF: 20

6. _____ is the direct computer-to-computer exchange of standard business documents.

ANS: Electronic data interchange or EDI

PTS: 1 REF: 21

7. SAP is the abbreviation for _____.

ANS: Systems Analysis and Program Development

PTS: 1 REF: 23

8. In _____, third-party software companies are encouraged to develop add-on software products that can be integrated with existing software.

ANS: open architecture

PTS: 1 REF: 24

9. Old systems are known as _____.

ANS: legacy systems

PTS: 1 REF: 25

10. SAP's biggest competitor is _____.

ANS: Oracle

PTS: 1 REF: 26

11. In an ERP system, all modules access the _____.

ANS: central database

PTS: 1 REF: 27

12. After a company chooses its major modules, it chooses from an assortment of _____ options.

ANS: configuration

PTS: 1 REF: 30

13. R/3's design incorporates _____, which means that R/3 designers choose the best, most efficient ways in which business processes should be handled.

ANS: best practices

PTS: 1 REF: 31

14. SAP's internal programming language is _____.

ANS: ABAP

PTS: 1 REF: 35

15. An assessment of an investment's project value that is calculated by dividing the value of the project's benefits by the value of the project's cost is known as a(n) _____.

ANS: ROI

PTS: 1 REF: 36

16. The statistical and logical analysis of large sets of transaction data is known as _____.

ANS: data mining

PTS: 1 REF: 41

17. _____ is the conducting of business over the Internet.

ANS: E-commerce

PTS: 1 REF: 41

SHORT ANSWER

1. The following figure depicts Moore's Law. What significance does this law have with regard to the development of ERP systems?

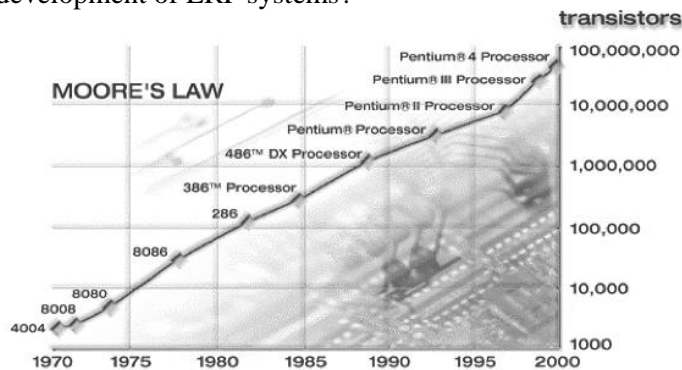


FIGURE 2-1 The actual increase in transistors on a chip approximates Moore's Law
Courtesy of Intel Corporation

ANS:

Computers had to be powerful enough to provide integrated, real time data for decision making

PTS: 1 REF: 19

2. Describe how information is exchanged between lower operating levels in the functional organization shown below.

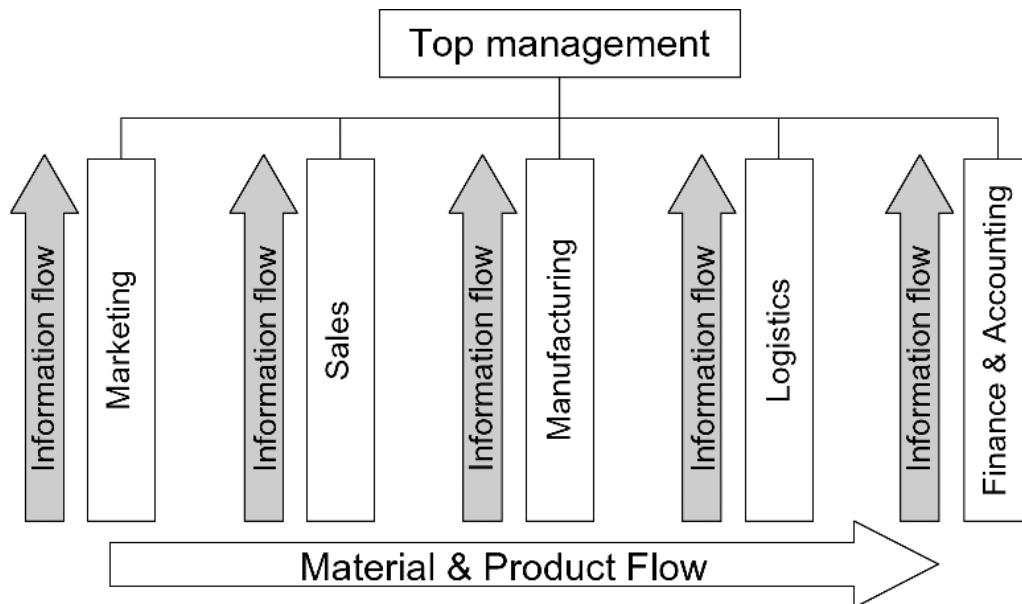


FIGURE 2-2 Information and material flows in a functional business model

ANS:

No exchange of information occurs between lower operating groups. Instead, exchange of information between operating groups is handled by top management which might not be knowledgeable about the functional area.

PTS: 1

REF: 22

3. Describe how information is exchanged between lower operating levels in the business process model shown below:

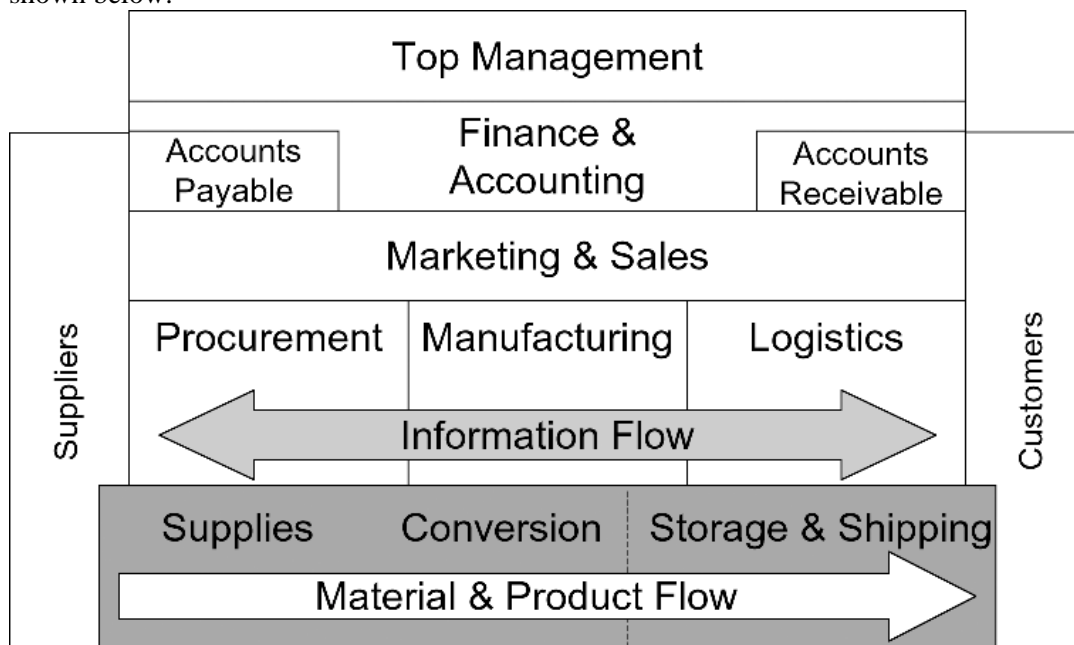


FIGURE 2-3 Information and material flows in a process business model

ANS:

Information can flow between operating levels without top management's involvement.

ESSAY

1. Besides the fact that ERP systems are integrated information systems and lead to more efficient business processes, there are other benefits. Outline them.

ANS:

The significance of ERP lies in its many benefits. As was previously mentioned, integrated information systems can lead to more efficient business processes that cost less than those in unintegrated systems. ERP systems have these benefits as well:

- ERP allows easier global integration: Barriers of currency exchange rates, language, and culture can be bridged automatically, so data can be integrated.
- ERP not only integrates people and data, but it also eliminates updating and repairing many separate computer systems. For example, Boeing had 450 data systems that fed data into its production process. The company now has a single way to record production data.
- ERP allows management to manage operations, not just monitor them. For example, without ERP, getting an answer to “How are we doing?” requires getting data from each business unit and then putting the data together for a comprehensive, integrated picture. The ERP system already has all the data, allowing the manager to focus on improving processes. This focus enhances management of the company as a whole, and makes the organization more adaptable when change is required.

PTS: 1

REF: 33-34

2. Discuss the various costs associated with the implementation of an ERP system for a large company and for a midsize company. How long does implementation take?

ANS:

Cost of an ERP system includes several factors:

- The size of the ERP software, which corresponds to the size of the company it serves
- New hardware that is capable of running complex ERP software
- Consultants' and analysts' fees

- Time for implementation (which causes disruption of business)
- Training (which costs both time and money)

A large company, one with well over 1,000 employees, will likely spend \$50 million to \$500 million for an ERP system with operations involving multiple countries, currencies, languages and tax laws. Such an installation might cost as much as \$30 million in software license fees, \$200 million in consulting fees, additional millions to purchase new hardware, and even more millions to train managers and employees. In addition, full implementation of the new system might take four to six years.

A midsize company (one with fewer than 1,000 employees) might spend \$10 million to \$20 million in total implementation costs and have its ERP system up and running in about two years.

PTS: 1

REF: 34

3. Discuss the reasons behind a bumpy rollout of an ERP system. Cite some real examples.

ANS:

Some reports indicate that only a low percentage of companies experience a smooth rollout of their new ERP systems *and* immediately begin receiving the benefits they anticipate. You should put such reports into perspective. *All* kinds of software implementations can suffer from delays, cost overruns, and performance problems, not just ERP projects. Such delays have been a major problem for the IS industry since the early days of business computing. Nevertheless, it is worth thinking specifically about why ERP installation problems can occur.

There are numerous cases of implementation woes in the press. W.L. Gore, the maker of GoreTex, had some problems implementing its PeopleSoft system for personnel, payroll, and benefits. The manufacturer sued PeopleSoft, Deloitte & Touche LLP, and Deloitte Consulting for incompetence. W.L. Gore blamed the consultants for not understanding the system and leaving its personnel department in a mess. PeopleSoft consultants were brought in to fix the problems, but the fix cost W.L. Gore additional hundreds of thousands of dollars. Hershey foods had a rough rollout of its ERP system in 1999, due to what experts say was the "Big Bang" approach to implementation, in which huge pieces of the system are implemented all at once. Companies rarely use this approach because it is so risky. Hershey lost a large share of the Halloween candy market that year due to ERP problems from this poor implementation.

Usually, a bumpy rollout and low ROI are caused by *people* problems and misguided expectations, not computer malfunctions. For example:

- Some executives blindly hope that new software will cure fundamental business problems that are not curable by any software.
- Some executives and IT managers don't take enough time for a proper analysis during the planning and implementation phase.
- Some executives and IT managers skim on employee education and training.
- Some companies do not place the ownership or accountability for the implementation project on the personnel who will operate the system. This lack of ownership can lead to a situation where the implementation becomes an IT project rather than a company-wide project.
- Unless a large project like an ERP installation is promoted from the top down, it is doomed to fail. The top executives have to be behind the project 100 percent for it to be successful.
- ERP implementation brings a tremendous amount of change for the users. Managers need to manage that change well so that the implementation goes smoothly.

Many ERP implementation experts stress the importance of proper education and training for both employees and managers. Most people will naturally resist changing the way they've done their jobs. Many analysts have noted that active top management support is crucial for successful implementation.

Some companies willingly part with funds for software and new hardware, but don't properly budget for employee training. ERP software is complex and can be intimidating at first. This fact alone supports the case for adequate training. Typically, ERP training costs \$10,000 to \$20,000 per employee. Some analysts recommend allocating 11 percent of the project's budget for training. The cost includes training employees on how to use the software to do their job, employees' nonproductive downtime during training, and—very important—educating employees about how the data they control affects the entire business operation.

Nestle has learned many lessons from its implementation of ERP systems. Its six-year, \$210 million project was initially headed for failure because Nestle didn't include on the implementation team any employees from the operating groups affected. Employees left the company, morale was down and help desk calls were up. After three years, the ERP implementation was temporarily stopped. Jeri Dunn, the vice president and CIO of Nestle USA learned that the project was not about implementing the software, but about change management. "When you move to SAP, you are changing the way people work... You are challenging their principles, their beliefs and the way they have done things for many, many years," said Dunn. Nestle ultimately reaped benefits from its ERP installation.

Most ERP installations do generate returns. Only 4 percent of managers reported that they had achieved *all* the benefits that they had anticipated from their ERP installation. Thirty-eight percent of managers have achieved the majority of benefits they expected, and 38 percent have achieved about half of the anticipated benefits.

PTS: 1

REF: 37-38