# Chapter 2: Introduction to SAP ERP

## Learning Objectives

After completing this chapter you will be able to::

1. Understand the evolution and key business benefits of enterprise systems
2. Understand the role of enterprise systems in supporting business processes
3. Understand the different categories of data in SAP ERP
4. Understand options for reporting

## Chapter Outline and Teaching Suggestions

1. Enterprise Systems
    a. Architecture of Enterprise Systems
        i. Client-Server Architecture
        ii. Service-Oriented Architecture
    b. Enterprise Resource Planning (ERP) Systems
    c. Application Platforms

***Explain enterprise systems in terms of their architecture, ERP systems, and application platforms. Point out that modern ES have either a three-tier client-server architecture or a service-oriented architecture, both of which have benefits and drawbacks. Students must understand that the client-server architecture has three layers as well as the function of each layer. Consider using a Web browser or SAP GUI as an aid in presenting an example. Figure 2-1 can also assist you.***

***Explain that service-oriented architecture provides the capability of connecting many different client-server systems together using a Web browser and new technologies (Web services). An example is a company that connects its system with a shipping company's system so that it can access shipping rates in real time.***

***Explain that the primary focus of an ERP system is the internal operations of a company; for example, human resources and sales and marketing. Figure 2-2 can be useful in explaining the ERP intra-company processes and the integration of functional and cross-functional business processes.***

***Figure 2-3 is useful in explaining SAP module names and abbreviations and the capabilities that each one provides.***

*Briefly explain the enterprise systems application suite, which is based on inter-company processes. The key point is that the data and processes are integrated among the systems in the application suite. Figure 2-4 can aid you.*
*Point out that the application platform is an enterprise operating system that allows a company to integrate its various systems so that the entire enterprise can function more efficiently. .*

*SAP's application platform is NetWeaver. Mention that companies use SOA to integrate SAP systems with non-SAP systems. In addition, SOA enables companies to build new composite applications and to plug in independent software vendor (ISV) applications on top of their ERP and suite applications. An example is a firm whose SAP enterprise system is integrated with an independent vendor's procurement system. Consider searching the Internet for a vendor to use as an example. Point out that the SAP Business Suite is executed on SAP NetWeaver. Figure 2-5 will assist you in explaining NetWeaver.*

2. Data In An Enterprise System
    a. Organizational Data
        i. Client and Company Code
        ii. Plant
    b. Master Data
        i. Material Master
        ii. Material Types
        iii. Material Groups
        iv. Organizational Level

    c. Transaction Data

    *Emphasize that the central component of the enterprise system is the database. It is important for students to understand how data are organized in SAP. Process steps such as hiring an employee and selling a product to a customer are based on data types such as organizational, master, and transaction.*

    *Explain that organizational data are used to represent the structure of the enterprise, such as a bank or a warehouse. Figure 2-6 will assist you in explaining organizational data.*

    *A key point is that the terms* **organizational data, organizational levels**, *and* **organizational elements** *are used interchangeably, depending on the context.*

    *The client is the highest organizational level. If the client is headquartered in the United States and has subsidiaries in other countries, then each subsidiary is represented at the company code level and has a separate legal entity and central organizational elements in*

*financial accounting. Figure 2-7 will assist you in explaining the organizational data for GBI.*

*Explain that a plant is a facility that provides value (multiple functions) such as a hospital, an office, and a university. Make students aware of the rules that govern the relationship between company codes and plants.*

*Explain that master data represent entities associated with the various processes. Examples of master data are customers, vendors, materials, and employees.*

*Explain that master data are shared by various processes such as fulfillment, procurement, and production. Each process requires data about the material that may or may not be needed by other processes. Emphasize that different views of the material master are provided for the different processes. Figure 2-8 will assist you in explaining the material master data views.*

*Explain material types and how they influence the type of data or view needed for a material. Explain that the material type determines which business processes are permitted to use the material. If possible, demonstrate the screens that appear in the material master record. Point out and describe the material types listed in Chapter 2, and mention that these types are a subset of the total number of material types provided by SAP. Figure 2-9 will assist you in explaining the GBI product structure. Use Demo 4.1: Review material types.*

*Explain material groups and how they are used.*

*Explain that materials can be defined differently for different organizational levels. Use Demo 4.2: Review material master data.*

*Explain transaction data, and provide examples such as payment and prices. Point out that transaction data are recorded in documents, which consist of a header and line items. Figures 2-10 and 2-11 will assist you in explaining transaction data. Use Demo 4.3: Review a purchase order.*

3. Reporting
    a. Work Lists
    b. Online Lists
    c. Information Systems
    d. Business Intelligence

*Explain the four types of reporting available with SAP. Point out that transaction and historical data are stored in the SAP main database.*

*Explain online transaction processing (OLTP), online analytic processing (OLAP), and the differences between them. Figure 2-12 can assist you in explaining both OLTP and OLAP. Point out that the OLAP environment utilizes information structures, which* ***capture and store specified transaction data in an aggregated form.*** *Each information structure is defined in terms of characteristics, key figures, and period definition. Figure 2-13 will aid you in explaining the three components of information structures.*

*Discuss the three broad categories (LIS, FIS, and HIS) of information systems that SAP provides. Identify the two types of information structures — standard and user-defined — and assess the value of each one.*

*Point out that SAP provides business intelligence via a separate SAP system and server. SAP BW systems are designed and optimized to process large quantities of data and to provide powerful analytics. Figure 2-19 will assist in providing an overview of SAP BW.*

*The following are valuable learning tools — Demo 2.4: Review a work list; Demo 2.5: Review an online list; and Demo 2.6: Review ERP reports.*

## Review questions

1. **Question:**
   Describe the client-server and service-oriented architectures. What are their advantages and disadvantages?

   **Answer:**
   Client-server architecture uses three layers to provide functionality: the presentation layer, application layer, and data layer. It uses a Web browser or a graphical user interface (GUI) to communicate with the application layer. In desktop applications all three layers are contained in one system. The shift to three-tier client-server architecture dramatically reduced the costs of acquiring, implementing, and using an enterprise system while significantly increasing the scalability of these systems. Service-oriented architecture allows multiple client server systems to communicate via new technologies called Web services. SOA also enables companies to create new applications quickly and inexpensively. In addition, it allows them to build composite applications on top of their existing three-tier client-server applications without changing the underlying applications. The disadvantage is that this arrangement exposes business processes and data contained in an enterprise system.

2. **Question:**
   What is an enterprise system application suite? Describe the capabilities of the individual components of the application suite.

   **Answer:**
   The collection of inter-company systems and an underlying intra-company ERP system is called an application suite. Suite vendors, such as SAP and Oracle, provide fairly comprehensive collections of applications that offer an enormous amount of functionality and cover most of the standard business processes. Supply chain management connects a company to other

companies that supply the materials it needs to make its products. Supply relationship management systems typically manage the overall relationships with the suppliers. Customer relationship management systems provide companies with capabilities to manage marketing, sales, and customer service. Product lifecycle management systems help companies administer the processes of research, design, and product management.

3. **Question:**
   Briefly explain the three types of data in an enterprise system and how they are related.

   **Answer:**
   The three types of data in an enterprise system are organizational data, master data, and transaction data. Organizational data are used to represent the structure of an enterprise. Examples of organizational structure are companies, subsidiaries, factories, warehouses, storage areas, and sales regions. Examples of organizational data are client, company code, and plant. Master data represent entities associated with various processes such as selling a product to a customer. Examples of master data are customers, vendors, and materials. Transaction data reflect the consequences of executing process steps, or transactions. Examples of transaction data are dates, quantities, prices, and payment and delivery terms. Transaction data are a combination of organizational data, master data, and situational data, that is, data that are specific to the task being executed, such as who, what, when, and where.

4. **Question:**
   Explain the relationship between client, company code, and plant in SAP ERP. What are these typically used to represent?

   **Answer:**
   A client is the highest organizational level in SAP ERP. It represents an enterprise consisting of many companies or subsidiaries. Each company within the enterprise is represented by a company code. Each company code represents a separate legal entity, and it is the central organizational element in financial accounting. A plant is an organizational element that performs multiple functions and is relevant to multiple processes.

5. **Question:**
   Why is the material master one of the most complex types of data in an ERP system? Provide some examples of data in a material master.

   **Answer:**
   The material master is one of the most complex types of data in an ERP system because it is used by many processes and each process uses the material differently. Each process, therefore, requires data about the material that may or may not be needed by other processes. To manage these data, the material master groups them into different categories or views, each of which is

relevant to one or more processes. Some of the data that are provided in the material master are basic data, sales data, and financial accounting data.

6. **Question:**
   What are material types? Explain the four common material types in SAP ERP.

   **Answer:**

   Material types are categories of materials that are based on how the materials are used in the firm's operations. The four most common material types are raw materials, semi-finished goods, finished goods, and trading goods. Raw materials are purchased from a vendor and used in the production process. Semi-finished goods are typically produced in-house from other materials and are used in the production of a finished good. Finished goods are created by the production process from other materials, such as raw materials and semi-finished goods. Trading goods are purchased from a vendor and resold to customers. The company does not perform any additional processing of trading goods prior to reselling them.

7. **Question:**
   What are material groups? How are they different from material types?

   **Answer:**

   Material groups consist of materials with similar characteristics. For example, all touring bikes can be included in one material group. In contrast, material types group materials based on how they are used. Examples of material types include raw materials and finished goods.

8. **Question:**
   How are transaction data created in an ERP system?

   **Answer:**
   Transaction data are a combination of organizational data, master data and situational data. A SAP ERP system records transaction data using several different types of documents, such as sales orders and purchase orders.

9. **Question:**
   Explain the document concept in SAP ERP. Explain the function of the four types of documents in SAP ERP.

   **Answer:**

   SAP ERP records transaction data using several different types of documents. Some of these documents are created or utilized as the process is being executed, whereas others record data after the process has been completed. The first category is referred as transaction documents. Documents that store data generated after the business processes have been completed include

financial accounting (FI) documents, management accounting or controlling (CO) documents, and material documents. These three categories are referred to as virtual documents because they reside in the enterprise system and are consulted or printed as needed.

10. **Question:**
    Most documents in SAP ERP have a common structure. Explain this common document structure.

    **Answer:**

    Documents typically consist of two sections, a header section and a detail or line item section. The header includes data applicable to the entire document, that is, to all line items. Examples of header data are dates and totals. A document can have one or more line items.

11. **Question:**
    Explain the three reporting options in SAP ERP. How are these different from each other? How are these different from the reporting options available in SAP BI?

    **Answer:**
    SAP ERP provides simple lists (online and work) of data and document and analytics via information systems using either standard information structures or user-defined information structures. SAP BI provides users with powerful analytic capabilities that are not available in the OLAP environment within SAP ERP.

## Exercises

Exercises for this chapter are available on the Wiley student companion website at http://www.wiley.com/college/magal/.

## Test Questions

Three types of test questions are provided – True/False, Multiple Choice (one right answer), and multiple answer (at least two right answers). These are provided in MS word format as well as in a format that can be imported as a test in blackboard.

The files are:

Chapter02 Test Questions True False.docx
Chapter02 Test Questions Multiple-choice.docx

Chapter02 Test Questions Multiple-answer.docx

Blackboard versions of these files are also provided. These versions end with the word Blackboard. Remember that these are zipped files that should be uploaded to blackboard as they are, without unzipping. Your blackboard administrator can help with any problems you encounter in uploading these files to your course on blackboard.

If you include all three types of questions, the following grading suggestion is offered.
T/F questions 1 point each
Multiple -choice questions 2 points each
Multiple -answer questions 3 (or 4) points each.

All of the correct answers must be chosen in order to receive credit for Multiple-answer questions. We suggest you do not offer partial credit.