

**Tutorial 2**  
**Development of ERP Systems**

---

**Objectives:**

- Define integrated information systems, and explain why they are essential in today's globally competitive business environment.
  - Identify the factors that led to the adoption of ERP systems.
  - Discuss the characteristics of ERP systems.
  - Discuss the benefits of ERP systems.
  - Explore the success and failures of ERP systems.
- 

**Discussion Questions: (~40 mins)**

In groups of 2 or 3, discuss the following questions.

1. What are the typical functions or departments in an organization? What type of work is done in each of these functions?
  2. Define integrated information systems, and explain why they are essential in today's globally competitive business environment.
  3. What are the motivating factors or impetus that drives management to consider ERP adoption?
  4. What are the main characteristics of an ERP system? What are some newly developed features of ERP systems?
  5. In what way does the SAP HANA platform support the real-time enterprise systems?
- 
- 

**Answer:**

1. What are the typical functions or departments in an organisation? What type of work is done in each of these functions?

The following table is just some examples of the many functions (and tasks) in an organisation:

**TABLE 1-1 Basic Activities in a Functional Organizational Structure**

Functions	Key Activities
Purchasing	Identify vendors Select vendors Create and send purchase orders to vendors Evaluate vendor performance
Warehouse (Inventory Management)	Receive goods from vendors Perform quality inspection of goods received Prepare goods to be returned to vendors Prepare goods for shipment to customers Ship goods to customers Receive goods returned by customers
Operations	Plan capacity Design workflow Schedule production Execute production Perform quality inspection of goods produced
Marketing and Sales	Identify customers Manage relationships with customers Promote products and services Receive customer orders Initiate processing of customer orders Provide after-sales service
Research and Development	Conduct research Develop/refine products Develop/refine processes
Finance and Accounting	Process incoming payments from customers Process outgoing payments to vendors Manage cash flow Manage capital needs Prepare financial statements
Human Resources	Identify workforce needs Recruit employees Hire employees Train employees Evaluate (appraise) employees Manage compensation Manage employee rights and benefits
Information Systems	Help process transactions Capture transaction data Provide information to monitor processes Provide information to detect and define problems with processes Provide information and tools to solve problems

2. Define integrated information systems, and explain why they are essential in today's globally competitive business environment.

Given the complexity of managing the data across entire processes, it is not feasible to rely on manually connecting functional information systems by printing information from one system and rekeying it into the next system. Therefore, in addition to moving from silos to processes, organisations must also move from functionally focused information systems to integrated enterprise systems (ES). Enterprise systems support the entire process rather than parts of the process. Put differently, enterprise systems not only support the execution of individual activities in a process, they also help the organisation coordinate work across functions. This coordination further reduces delays, avoids excess inventory, and increases visibility.

In addition to eliminating the need to communicate explicitly among departments, enterprise systems make processes more efficient by automating some of the routine steps in the process. In the procurement process, for example, when a purchase requisition is created, the ES automatically selects a suitable supplier, creates a purchase order, and sends it to the supplier, based on previously established rules. In the fulfilment process, the ES automatically

generates an invoice as soon as a shipment is sent to the customer and electronically send it to the customer.

Another benefit of enterprise systems is that they provide greater visibility across the process. Each person involved in the process has almost instant access to the information about the process. At any time, the system can be queried about the current state of the customer order or purchase requisition, for example, which part of the order fulfilment process is currently being executed, or when the purchase order was sent to the supplier. This increased visibility reduces uncertainty for all. (Magal, Simha. Essentials of Business Processes and Information Systems. Wiley)

3. What are the motivating factors or impetus that drives management to consider ERP adoption?

- Hard economic times of the late 1980s and early 1990s caused many companies to downsize and reorganize – which acts as a stimulus to ERP development.
- Inefficiencies caused by the functional model of business organization which limits the exchange of information between the operating levels.
- Functional model led to top-heavy and overstaffed organizations incapable of reacting quickly to change
- Process business model - Information flows between the operating levels without top management's involvement
- With the introduction of the Sarbanes-Oxley Act (2002) which requires companies to substantiate internal controls on all information – adopting ERP systems helps with the compliance of this regulation.

4. What are the main characteristics of an ERP system? What are some newly developed features of ERP systems?

Main characteristics of an ERP system:

- Single database
- Consistent information
- Management control
- Open architecture
- Global integration
- Easier maintenance due to one system, not many legacy systems

Newly developed features of ERP systems:

- BW – Business Warehouse
- BI – Business Intelligence
- In-memory computing – eg SAP HANA

### **Case Study/Practical Exercises and Discussion: (~40 mins)**

#### 1. Integrated Information Systems

Large organizations dealing with hundreds, or thousands of suppliers have a difficult task in keeping information flowing to the right person at the right time. At one point, Lockheed Martin Aeronautics, with \$13.2 billion in sales (2010) and over 29,000 employees, was running 75 legacy systems, some dating from the 1970s. To stay efficient while keeping customers happy and taking on more aircraft orders, the company decided to implement an Enterprise Resource Planning system.

Lockheed Martin's final system allows suppliers to handle more of their own transactions by accessing the new ERP system through an existing secure Web portal. For example, using the portal, a supplier can now track each step of an order. In addition, the supplier can see the production trends at Lockheed Martin, and plan its own production to satisfy Lockheed Martin's needs—in effect, anticipating orders. Through this integration of many systems into one large ERP system, Lockheed Martin was able to cut costs and connect suppliers worldwide into its system, enabling the company to become more efficient.

In another industry, Tumi, Inc., the luggage and travel products company, was running several legacy systems that were written “in-house,” meaning they were programmed by company staff. The different systems covered processes such as taking an order, running the warehouse, and completing financial statements. None of the systems were linked; therefore, passing information from one system to another was a slow and cumbersome process. Tumi could not fill its orders on time, had excess inventory in the warehouse, and was frequently unable to meet customers' shipping deadlines. To address these issues—and to better support the company's expansion plans—Tumi made a conscious effort to make information technology a business driver, and the company brought in an ERP system to integrate the business functions. With the new integrated ERP system, Tumi has been able to expand its business, decrease inventory by 30 percent, cut its warehouse space by 38 percent, and increase sales by 25 percent. Tumi's management believes that one of the company's primary strengths lies in its integrated systems. Manufacturing is now quick to react when demand increases, and forecasting is more accurate. Source: Ellen Monk, Bret Wagner. (2013). Concepts in Enterprise Resource Planning. (4e) Course Technology, Cengage Learning. (Pg 15)

- Discuss the problems that both Lockheed Martin and Tumi faced with an unintegrated system.
  - How does the implementation of an ERP system improve the performance of both companies?
-