

Learning Resource

Enterprise Systems

First, what do we mean by an **enterprise system**? This term refers to systems that integrate data across an enterprise (organization) to support the business processes related to a variety of business functions—from basic functions like human and financial resource management to managing the supply chain and customer relationships. The same system is used by employees performing a specific function from anywhere in the organization. Some business functions for which enterprise-wide solutions are often used include the following:

- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- Customer Relationship Management (CRM)
- Enterprise Messaging Systems (to include email)
- Human Resources Management
- Financial Management
- Billing and Payment Processing
- Call Center and Customer Support
- Enterprise Content/Document Management

These functions can be done by one large-scale, enterprise-wide system that integrates several major functions, or through linking (or integrating) individual systems through a type of middleware—usually referred to as *enterprise application integration (EAI)*. Generally, it is much more effective to use a single integrated platform rather than multiple applications that were not designed to work together.

Enterprise systems can be developed in-house or acquired as a commercial off-the-shelf (COTS) product. COTS products can be purchased and implemented on internal servers or acquired as a Software-as-a-Service (SaaS) from a cloud service provider. To attract more customers, the COTS/SaaS vendors implement features that all their customers can benefit from, such as heightened security protections, support for new industry standards and legislation, and increased ability to separate system access and update by job function.

The focus in this section will be on COTS systems developed to manage one or more business functions across the organization. The three most common types of enterprise systems will be covered: Enterprise Resource Planning (ERP), Supply Chain Management (SCM) and Customer Relationship Management (CRM).

Enterprise Resource Planning (ERP) Systems

An ERP system is built to support an integrated approach to managing some or all of the core processes involved in running a company: human resources management, financial management, procurement, etc. ERP systems were originally developed to handle these "back office" functions. ERP is actually the business *process* of integrating the core functions across an organization; the term by itself is not defined as a "system," although many people refer to an ERP systems as an "ERP."

ERP software was developed to implement the ERP process; such software integrates, standardizes and streamlines (or optimizes) the business processes across departments. Users of the various functions of ERP system are presented with common screens and system functions to allow them to move easily between functional components, and to reduce training costs. Generally, the ERP system operates as a single system with a common database employing common data definitions. Using one database saves organizations from updating several systems with the same data, and provides greater accuracy and collaboration between departments. Transactions are processed against the database immediately, and the updated information is available across the organization immediately. This is in contrast to an organization using multiple "stovepipe" systems with redundant (and often not synchronized) data. For example, employee data (name, address, SSN, etc.) is stored once and can be accessed for payroll, timekeeping, travel expense reimbursement, facilities access, etc., and if the employee makes a change, it is changed in one place for all to access.

In summary, the characteristics of an ERP include:

- enterprise-wide integration,
- a common database,
- real-time operation and processing of data and transactions, and
- consistent look and feel.

Business Benefits of ERPs

ERPs improve the efficiency and effectiveness of business operations by providing:

- **Integrated information** that is consistent across the enterprise and provides a "single truth" in areas such as
 - **Financial information**—There is one set of financial figures that everyone can use.
 - **HR information**—Employees can enter updates directly into the system, and their skills and experience can be viewed by managers across the organization.
 - **Order information**—Orders affect inventory, accounting, distribution, and manufacturing, all of which can be updated in the single system when an order is placed.
 - **Customer information**—The same customer information is available to all departments.
- **Best practices**—The systems are designed to implement best business practices for each of the functional areas and streamline the steps in the process, reducing the time required to complete each process.
- **Standardized business processes**—All users of the system perform the function in the same way, and every process is supported by the system with a similar look and feel for all users, regardless of their department.
- **Lower IT costs**—The use of a single system for multiple functions reduces total costs associated with acquiring, operating, and maintaining multiple systems; however, if the ERP is significantly modified to fit the organization, the cost advantage may disappear.
- **Reduced training costs**—Employees use a similar interface for all major business functions.
- **Consolidated procurements**—The use of a single system for purchasing products provides opportunities to consolidate similar orders from various departments to receive volume discounts.
- **Improved compliance**—Time and effort are reduced in responding to the wide variety of government reporting requirements, including financial reporting, human resources and wage reporting, environmental reporting, etc. Compliance is also enforced through the standardized business processes implemented in the ERP.

ERPs lead to **better decision-making**.

- **Common data** that is shared across the organization is used for analysis and decision-making.
- **Better data** improves planning and reporting.
- ERPs promote **collaboration** across departments and levels of the organization since all involved have the same version of the facts.

- ERPs support **distributed decision-making**, as participants can act locally in accordance with the guidance provided and the results of their actions are available throughout the organization.

ERPs lead to increased organizational **agility**.

- The standardization and simplification of the business processes and the use of a common system allows the organization to adapt quickly when necessary.

ERPs provide **enhanced security** for corporate data.

- Data that is stored in one location can be better secured than data that is stored in multiple locations, especially since corporate data may be stored on hundreds of servers and personal computers anywhere and its existence may even be unknown to the security specialists.
- Vendors serving multiple customers can provide better and more extensive security for systems and data than individual organizations are able to provide.

Industry-specific ERPs are designed to support the unique business processes of the industry, such as those required by financial institutions, service industries, government, health care, higher education, and hospitality. The way that processes are carried out in each of those can be quite different. ERPs are also designed specifically for small, small-to-medium size, large, and very large international organizations. The size and type of organization are taken into account when selecting an ERP.

Major Disadvantages of Implementing ERPs

- The **time it takes to implement** them: Since ERPs are used throughout the organization, many departments are affected and much coordination is required. Further, since the ERP may be replacing a myriad of systems implemented throughout the organization (including on individual desktop PCs), it takes a considerable amount of time to discover all those legacy systems and determine if and how to incorporate the data into the new system.
- The **cost** of the system: There are initial purchase costs, which can be quite high, and significant implementation costs to coordinate the implementation across the enterprise. Depending on the amount of customization needed, the ongoing maintenance costs can be very high, since each new release from the vendor needs to be thoroughly tested, and any modifications already made need to be applied to the upgraded system.
- **Change management** is required before, during and after implementation to align business practices with the way the system works.

There have been some very well publicized ERP implementation **failures**, and you may have witnessed one where you work(ed). Among the causes of failure are:

- **Selecting the wrong ERP.** As mentioned above, ERPs are designed for various sizes of organizations. Choosing an ERP with too many features may overwhelm a small organization; conversely, not having enough features to support a very large and diverse organization can lead to failure. Although ERP systems were originally designed for large organizations, there are now many products available for small to mid-sized businesses.
- **Customizing the ERP.** When organizations implement an ERP, their business processes must be adapted to the way the system is designed. If an enterprise determines that they will modify the software to match their process, many issues are introduced. The time to implement and the costs go up significantly, as does the risk. Future upgrades from the vendor may not function without significant code changes due to the customization.
- **Employee resistance.** People resist change, but employee resistance seems much more common with ERPs, where the changes are more pervasive and obvious. The process changes that an ERP requires may remove flexibility formerly enjoyed by the staff, who might perceive a loss of autonomy and control.
- **Lack of common data definitions.** When an ERP is implemented, data from multiple stovepipe systems must be migrated to the single database. Most often those legacy systems each have their own definitions and formats for the data – and the same data item stored in different systems may be called by a different name and/or may be formatted differently. Before the data can be loaded into the ERP, a common set of definitions and formats is needed. For some organizations, this is an insurmountable problem, and they end up abandoning their ERP implementation.

ERP Summary

ERP systems have been extended in many organizations to include seamless integration of supply chain management (SCM) and customer relationship management (CRM) processes and data across the organization. Linked with ERPs, SCM and CRM systems provide the end-to-end visibility of a company's information; the ERP provides the "glue" to allow all the systems of an enterprise to work together to get the right information to the right people at the right time.

By now two things should be clear:

1. Effective ERPs can provide great strategic advantage to an organization and help break down the stovepipes of information aligned to specific functions (like human resources, finance, etc.).

- 2. ERPs require significant investment of time and money and can be very expensive to effectively select and implement.

Supply Chain Management (SCM) Systems

If you think of the basic model of a business, it is: input/process/output. Resources (human, financial or supply resources) come in, and then the work of the company is to transform them some way into something that customers want (process), and then provide it to the customers (output)—the output could be to wholesalers, retailers, or individual customers. A simplistic overview of the input/process/output supply business model is provided in the table below:

Input/Process/Output Supply Business Model

Industry	Input	Process	Output
Manufacturing	Raw materials	Combine raw materials to make a product	Product
Consulting	Information; human capital (analysts)	Analysis	Report
Restaurant	Fresh or frozen food	Cooking/Preparation	Meals

SCM can be thought of as "the management of the chain of supplies." It encompasses the range of activities needed to plan, manage, and execute the development of the product, from the acquisition of raw materials, through production and distribution, all the way to the final customer. The objective is to do so in the most cost-effective manner possible.

In the example of a simplified manufacturing supply chain, we might start with several suppliers of raw materials—all the things needed to make the product. Each of these items may come from a different supplier, in different quantities, and on different schedules. All of the necessary items need to be assembled at the manufacturing plant and then they are put together to make the product. The product then is shipped to a warehouse where it is stored. At the appropriate time, product is moved from the warehouse to a retail store, where it is put on a shelf to be sold. The supply chain does not stop there. After the product is sold, it may need service, or the customer may wish to return it. Every one of these steps have costs and complexity associated with them. Through SCM, both management and employees can view what's happening along the supply chain to make better decisions. Each step in the supply chain provides an opportunity to impact profitability, quality, etc.

In today's world, it is impossible to have an effective supply chain without the use of technology, including the right technology solution to implement the business strategy. Companies compete on the basis of who has the right product, in the right place, at the right time. Once again, getting the right information to the right people at the right time is critical to successful SCM, and that is exactly what good SCM systems do. Businesses use SCM to *plan, source, make, deliver, and return* their products. SCM helps them develop a plan for managing all the resources needed; choose reliable suppliers; manufacture their products or services; implement their logistics processes (receive and fulfill orders and receive payment); and provide for returns, excess product, and customer support. This is an iterative process that goes on continuously as companies monitor, evaluate, and modify their supply chains. SCM is a clear example of the relationship between people, information, business processes, and information technology.

Customer Relationship Management (CRM) Systems

CRM, like ERP and SCM, is a **business philosophy**, not a technology, although many people use the term to represent a system. CRM is based on the idea that a strong competitive advantage can be achieved by understanding customer needs. Companies that recognize that their customers are not just generators of revenue but are valued assets are moving quickly from a focus on their product to a focus on the customers. As companies deal with customers around the world and expanding competition, they find that adopting a CRM strategy is essential. It costs much less to make a repeat sale to an existing customer than it costs to make a sale to a new customer.

CRM helps organizations of all sizes, but the larger the company, the more complex the problems become. Here's where an information system can provide immense value—allowing the company to capture information, make it available to all functions that need to know something about the customers, and provide superior customer service. In addition, the availability of this data enables companies to analyze the information to determine patterns and trends in customer habits, analyze demographic profiles of customers to target

marketing campaigns, and identify ways to build customer loyalty. CRM systems can link customer information from a variety of sources, including social media. While they are designed for use by marketing, sales, and support organizations, the information they contain can inform a wide variety of business decisions, such as production levels, geographic distribution of their products, markets for new products, etc.

ERP, SCM, or CRM System?

SCM and CRM systems bring similar advantages and disadvantages to those discussed above for an ERP. Organizations determine which type of enterprise system is appropriate based on analysis of the requirements of the organization, just as for any other system. If the organization simply wishes to automate its "back office" functions, then an ERP (focused on accounting or finance) may suffice. If the organization can take advantage of an industry-specific ERP to perform those functions in a way that is uniquely suited to the industry, then that is the category of ERP that should be researched. If the organization needs supply chain or customer relationship management tools, and already has an ERP in place, it might look for additional modules from the ERP vendor to perform those functions. Such solutions should come with built-in integration with the ERP, which could greatly benefit the organization. If an SCM or a CRM is needed and there is no ERP in place, the organization should consider the totality of its requirements and determine whether a combined capability is needed or a point solution (just SCM or CRM) is what is needed. Certainly an SCM or a CRM can be implemented on its own, but as the organization looks forward, it may wish to select such a system that has the ability to be expanded to include other modules as may be needed in the future. The selection should, therefore, be based on a combination of what the needs are, what systems are already in place, and what future needs should be considered.

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