Chapter 9

Electronic Commerce Software

At a Glance

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Chapter Overview

In this chapter, you will learn that companies that undertake electronic commerce initiatives often combine software and tools from different vendors to accomplish their goals. Although small companies can sometimes use a single vendor to supply all their electronic commerce software, most companies need to integrate a number of software products, each of which performs a particular task or process.

Chapter Objectives

In this chapter, you will learn about:

- Finding and evaluating Web hosting services
- Basic functions of electronic commerce software
- Advanced functions of electronic commerce software
- Electronic commerce software for small and midsize businesses
- Electronic commerce software for midsize to large businesses
- Electronic commerce software for large businesses that have an existing information technology infrastructure

Instructor Notes

Web Hosting Alternatives

Service providers offer clients hosting arrangements that include shared hosting, dedicated hosting, and co-location. Shared hosting means that the client’s Web site is on a server that hosts other Web sites simultaneously and is operated by the service provider at its location. With dedicated hosting, the service provider makes a Web server available to the client, but the client does not share the server with other clients of the service provider. In both shared hosting and dedicated hosting, the service provider owns the server hardware and leases it to the client. The service provider is responsible for maintaining the Web server hardware and software, and provides the connection to the Internet through its routers and other network hardware. In a co-location (also spelled collocation and colocation) service, the service provider rents a physical space to the client to install its own server hardware. The client installs its own software and maintains the server. The service provider is responsible only for providing a reliable power supply and a connection to the Internet through its routers and other networking hardware.
Basic Functions of Electronic Commerce Software

The specific duties that electronic commerce software performs range from a few fundamental operations to a complete solution - from catalog display to fulfillment notification. All electronic commerce solutions must at least provide:

| Basic Components:          | ♦ A catalog display  
|                           | ♦ Shopping cart capabilities  
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<th>♦ Transaction processing</th>
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| Additional Software Components: | ♦ Middleware that integrates the electronic commerce system with existing company information systems that handle inventory control, order processing, and accounting  
|                           | ♦ Enterprise application integration  
|                           | ♦ Web services  
|                           | ♦ Integration with enterprise resource planning (ERP) software  
|                           | ♦ Supply chain management (SCM) software  
|                           | ♦ Customer relationship management (CRM) software  
|                           | ♦ Content management software  
|                           | ♦ Knowledge management software  |

Catalog Display

A small commerce site can have a very simple static catalog. A catalog is a listing of goods and services. A static catalog is a simple list written in HTML that appears on a Web page or a series of Web pages. To add an item, delete an item, or change an item’s listing, the company must edit the HTML of one or more pages. Larger commerce sites are more likely to use a dynamic catalog. A dynamic catalog stores the information about items in a database, usually on a separate computer that is accessible to the server that is running the Web site itself. A dynamic catalog can feature multiple photos of each item, detailed descriptions, and a search feature that allows customers to search for an item and determine its availability.

Shopping Cart

In the early days of electronic commerce, shoppers selected items they wanted to purchase by filling out online forms. Using text box and list box form controls to indicate their choices, users entered the quantity of an item in the quantity text box, the SKU (stock-keeping unit) or product number in another text box, and the unit price in yet another text box. This system was awkward for ordering more than one or two items at a time.
The forms-based method of ordering has given way to electronic shopping carts. Today, shopping carts are a standard of electronic commerce. A shopping cart, sometimes called a shopping bag or shopping basket, keeps track of the items the customer has selected and allows customers to view the contents of their carts, add new items, or remove items. To order an item, the customer simply clicks that item. All of the details about the item, including its price, product number, and other identifying information, are stored automatically in the cart. If a customer later changes his or her mind about an item, he or she can view the cart’s contents and remove the unwanted items. When the customer is ready to conclude the shopping session, the click of a button executes the purchase transaction.

**Transaction Processing**

Transaction processing occurs when the shopper proceeds to the virtual checkout counter by clicking a checkout button. Then the electronic commerce software performs any necessary calculations, such as volume discounts, sales tax, and shipping costs. At checkout, the customer’s Web browser software and the seller’s Web server software both switch into a secure state of communication.

Transaction processing can be the most complex part of the online sale. Computing taxes and shipping costs are important parts of this process, and site administrators must continually check tax rates and shipping tables to make sure they are current. Some software enables the Web server to obtain updated shipping rates by connecting directly to shipping companies to retrieve information.

**Advanced Functions of Electronic Commerce Software**

In this section, you will learn about the features that larger companies need in their electronic commerce software. Although there are exceptions, such as Amazon.com and Buy.com, most large companies that have electronic commerce operations also have substantial business activity that is not related to electronic commerce. Thus, integrating electronic commerce activities into the company’s other operations is very important.

**Middleware**

Larger companies usually establish the connections between their electronic commerce software and their existing accounting system by using a type of software called middleware. Some large companies that have sufficient IT staff write their own middleware; however, most companies purchase middleware that is customized for their businesses by the middleware vendor or a consulting firm. Thus, most of the cost of middleware is not the software itself, but the consulting fees needed to make the software work in a given company. Making a company’s information systems work together is called interoperability and is an important goal of companies when they install middleware.
Enterprise Application Integration and Databases

A program that performs a specific function, such as creating invoices, calculating payroll, or processing payments received from customers, is called an application program, application software or, more simply, an application. An application server is a computer that takes the request messages received by the Web server and runs application programs that perform some kind of action based on the contents of the request messages. The actions that the application server software performs are determined by the rules used in the business. These rules are called business logic. An example of a business rule is: When a customer logs in, check the password entered against the password file in the database.

Application servers are usually grouped into two types: page-based and component-based systems. Page-based application systems return pages generated by scripts that include the rules for presenting data on the Web page with the business logic. Larger businesses often prefer to use a component-based application system that separates the presentation logic from the business logic. Each component of logic is created in its own module.

Web Services

Companies are beginning to extend the idea of application server systems so that these programs can communicate across organizational boundaries. Although a generally accepted definition has not yet evolved, many IT professionals define Web services as a combination of software tools that let application software in one organization communicate with other applications over a network by using a specific set of standard protocols known by their acronyms: SOAP, UDDI, and WSDL. Another definition of Web services that IT professionals use is: a self-contained, modular unit of application logic that provides some business functionality to other applications through an Internet connection.

Issues Box: CIOs Focus on Internet, Web Services

NewsFactor's CIO Today Magazine asked CIOs from Fortune 1000 companies in a variety of industries what emerging technologies are going to be important for their enterprises. Their responses generally fell into two broad categories: technologies that are "way out there" and perhaps will not become mainstream for five to 10 years, and technologies that are available today but have not yet hit their stride in terms of realizing business benefits.

Web services is a technology that can be grouped in the "available today" category. Such vendors as SAP, IBM, Microsoft, BEA, and Oracle already offer Web-service integration products and services.

What is new and exciting about Web services is not the technology per se, but the effect it will have on the enterprise. "Web services hold a lot of promise as the tools to unlock and improve the mining of information," Lockheed Martin CIO Joseph R. Cleveland told NewsFactor's CIO Today. Intelligent agents -- that is, "technologies that help us get access to information and quickly get it in a form that helps us make decisions -- have huge potential in terms of changing business," Cleveland said.

Web service technology isn't necessarily new, but what is emerging is the real value proposition and the business
process side to it," agrees Thomas Shelman, Northrop Grumman CIO. "Web services will become a BPO proposition. We're just scratching the surface."

During the mid to late 1990s, most CIOs were involved in a frenzied rush to implement Web applications. Many organizations had an almost single-minded focus on becoming e-businesses and taking advantage of the Internet's low cost, ubiquitous access to information.

While the pace has slowed -- some would add "thankfully" -- in delivering new applications, CIOs are becoming introspective, looking at the applications born as a result of that frenzy and trying to make sense of how they can be tied together with Web services.

CIOs are extremely interested in Web-service technology. 85 percent of the respondents to a recent Forrester Research survey said they intended to implement Web services in the near future. But there is a glitch. "We are not quite where we need to be with regards to having a complete stack of Web-service standards," Forrester Research vice president Uttam Narsu told NewsFactor's CIO Today. "I think we are going to be looking into 2005 before we will see a relatively stable set of specifications," he said.

Source: http://cio-today.newsfactor.com/story.xhtml?story_title=CIOs_Focus_on_Internet__Web_Services&story_id=23743

Question

- What are some of the hurdles that must be overcome in order to successfully implement Web services?

Integration with ERP Systems

Many B2B Web sites must be able to connect to existing information systems such as enterprise resource planning software. Enterprise resource planning (ERP) software packages are business systems that integrate all facets of a business, including accounting, logistics, manufacturing, marketing, planning, project management, and treasury functions. The major ERP vendors include Baan, Oracle, PeopleSoft, and SAP. A typical installation of ERP software costs between $2 million and $25 million; thus, companies that are already running these systems have made a significant investment in them and expect their electronic commerce sites to integrate with them.

Quick Quiz

1. A(n) _____ is a simple list written in HTML that appears on a Web page or a series of Web pages.
   Answer: static catalog

2. _____ occurs when the shopper proceeds to the virtual checkout counter by clicking a checkout button.
   Answer: Transaction processing

3. Making a company’s information systems work together is called _____.
   Answer: interoperability
4. A(n) _____ a computer that takes the request messages received by the Web server and runs application programs that perform some kind of action based on the contents of the request messages.
   Answer: application server

5. _____ software packages are business systems that integrate all facets of a business, including accounting, logistics, manufacturing, marketing, planning, project management, and treasury functions.
   Answer: Enterprise resource planning (ERP)

Electronic Commerce Software for Small and Midsized Companies

Using a service provider’s shared or dedicated hosting services instead of building an in-house server or using a co-location service means that the staffing burden shifts from the company to the Web host. CSPs have the same advantages as ISP hosting services, including spreading the cost of a large Web site over several “renters” hosted by the service. The biggest single advantage - low cost - occurs because the host provider has already purchased the server and configured it. The host provider has to worry about keeping it working through lightning storms and power outages.

Mall-Style Commerce Service Providers

Mall-style CSPs provide small businesses with an Internet connection, Web site creation tools, and little or no banner advertising clutter. Web hosts in this group charge a monthly fee that is often higher than that of lower-end providers, and may also charge one-time setup fees. Some of these providers also charge a percentage of or fixed amount for each customer transaction. These Web hosts also provide high quality tools, storefront templates, an easy-to-use interface, and quick Web page generation capabilities and page maintenance.

Mall-style CSPs provide shopping cart software or the ability to use another vendor’s shopping cart software. They also furnish customer payment processing so that customers can choose to purchase their goods and services with a credit card or other form of payment. The CSP processes the acceptance and authorization of credit cards on behalf of the merchant. Another benefit is that because they are paying a monthly fee to the CSP, sites do not have to display any Web banners, which can be unattractive and distracting. The fourth benefit of the mall-style CSPs is that they provide higher-quality Web store building and maintenance tools than do the basic CSPs.

Estimated Operating Expenses for a Small Web Business

A reasonable guideline for payment processing fees that would be charged to a new merchant opening a business on the Web is about 3 percent of gross sales. Thus, if a site’s annual gross sales are $50,000, then the payment processing fees should be approximately $1500. That estimate would include both the per-transaction fixed costs and the percentage of total sales costs charged by most merchant credit card processing agencies.
Electronic Commerce Software for MidSize to Large Businesses

Midrange packages allow the merchant to have explicit control over merchandising choices, site layout, internal architecture, and remote and local management options. In addition, the midrange and basic electronic commerce packages differ on price, capability, database connectivity, software portability, software customization tools, and computer expertise required of the merchant.

- **Web site development tools**: Although they are more often used for creating small business sites, it is possible to construct the elements of a midrange electronic commerce Web site using Web page creation and site management tools. For example, recent versions of Macromedia Dreamweaver all include integrated development environments.
- **Intershop Enfinity**: Provides search and catalog capabilities, electronic shopping carts, online credit card transaction processing, and the ability to connect to existing back-end business systems and databases.
- **IBM WebSphere Commerce Professional Edition**: A set of software components that provides software suitable for midsize to large businesses to sell goods and services on the Internet. It includes catalog templates, setup wizards, and advanced catalog tools to help companies create attractive and efficient electronic commerce sites.
- **Microsoft Commerce Server 2002**: Allows businesses to sell products or services on the Web using tools such as user profiling and management, transaction processing, product and service management, and target audience marketing.

Electronic Commerce Software for Large Businesses

Larger businesses require many of the same advanced capabilities as midsize firms, but the larger firms need to handle higher transaction loads. In addition, they need dedicated software applications to handle specific elements of their online business. In this section, you will learn about electronic commerce software that has higher transaction-load capability, and you will learn about software that accomplishes specific tasks in large businesses, such as customer relationship management, supply chain management, content management, and knowledge management.
♦ **Enterprise-Class Electronic Commerce Software:** Enterprise-class electronic commerce software running large online organizations usually requires several dedicated computers - in addition to the Web server system and any necessary firewalls. Examples of enterprise-class products that can be used to run a large online business with high transaction rates include IBM WebSphere Commerce Business Edition, Oracle E-Business Suite, and Broadvision One-To-One Commerce.

♦ **Customer Relationship Management Software:** Must obtain data from operations software that conducts activities such as sales automation, customer service center operations, and marketing campaigns. The software must also gather data about customer activities on the company’s Web site and any other points of contact the company has with its existing and potential customers.

♦ **Supply Chain Management Software:** Helps companies to coordinate planning and operations with their partners in the industry supply chains of which they are members. SCM software performs two general types of functions: planning and execution.

♦ **Content Management Software:** Helps companies control the large amounts of text, graphics, and media files that have become a key part of doing business. With the rise of wireless devices, such as mobile phones, handheld computers, and personal digital assistants (PDAs), content management has become even more important.

♦ **Knowledge Management Software:** Helps companies do four main things: collect and organize information, share the information among users, enhance the ability of users to collaborate, and preserve the knowledge gained through the use of information so that future users can benefit from the learning of current users. KM software includes tools that read electronic documents (in formats such as Microsoft Word or Adobe PDF), scanned paper documents, e-mail messages, and Web pages.

### Quick Quiz

1. _____ software helps companies to coordinate planning and operations with their partners in the industry supply chains of which they are members.
   Answer: Supply chain management (SCM)

2. _____ helps companies control the large amounts of text, graphics, and media files that have become a key part of doing business.
   Answer: Content management
3. True or False: The goal of CRM is to understand each customer’s specific needs and then customize a product or service to meet those needs.  
   Answer: True

4. True or False: A server must be housed in a room that is both secure and convenient to communications access.  
   Answer: True

Discussion Questions

- Discuss the security risks involved in allowing cookies to be stored on your computer.
- Why is transaction processing considered the most complex part of online processing?
- What are the advantages of having middleware developed in-house?

Additional Resources

- Middleware: http://www.sei.cmu.edu/str/descriptions/middleware.html

Key Terms

- **Application server**: A computer that takes the request messages received by the Web server and runs application programs that perform some kind of action based on the contents of the request messages.
- **Application service providers**: Firms that offer Web server management and the renting of application software.
- **Data mining**: Looking for hidden patterns in data.
- **Interoperability**: Making a company’s information systems work together.
- **Middleware**: Software used by companies to establish the connections between their electronic commerce software and their existing accounting system.
- **Web services**: A combination of software tools that let application software in one organization communicate with other applications over a network by using a specific set of standard protocols known by their acronyms: SOAP, UDDI, and WSDL.