

Chapter 18

Building E-Commerce Applications and Infrastructure

Learning Objectives

Upon completion of this chapter, you will be able to:

1. Discuss the major steps in developing an EC application.
2. Describe the major EC applications and list their major functionalities.
3. List the major EC application development options along with their benefits and limitations.
4. Describe various EC application outsourcing options.
5. Discuss the major components of an electronic catalog and EC application suite.
6. Describe various methods for connecting an EC application to back-end systems and databases.
7. Describe the criteria used in selecting an outsourcing vendor and package.
8. Discuss the value and technical foundation of Web services in EC applications.
9. Understand the value and uses of EC application log files.
10. Discuss the importance and difficulties of EC application maintenance.

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Answers to Pause/Break Section Review Questions

Section 18.1 Review

1. *List the major steps in developing an EC application.*

The steps involved include: creating the architecture; selecting the development option; installing, testing and applying the application; and operations and maintenance.

2. *Define the various types of testing used during the EC development process.*

The types of testing include:

unit testing: testing application software modules one at a time

integration testing: testing the combination of application modules acting in concert

usability testing: testing the quality of the user's experience when interacting with the Web site

acceptance testing: determining whether a Web site meets the original business objectives and vision

Section 18.2 Review

1. *List the major subsystems of an electronic storefront.*

The three major subsystems include a merchant system, a transaction system, and a payment gateway.

2. *Describe some of the major functions required by an aggregating catalog.*

Some functions required of an aggregating catalog include: search engines, comparison engines, ordering mechanisms, budget and authorization features, usage comparisons, and a payment mechanism.

3. *Describe some of the major functions needed to build a reverse auction.*

Some of the functions required to build a reverse auction include: a catalog of items, a search engine, personalized pages, reverse auction mechanisms, RFQs, dynamic bidding, vendor approval, electronic collaboration, site maps, suppliers select matching systems, business process workflow systems, m-commerce systems, and language translation.

4. *List some of the functional requirements of an online exchange.*

Some of the requirements for an online exchange include: collaboration services, community services, automated workflow, integrated business process solutions, logistics coordination, integration services, data mining, transaction flow, negotiation systems, language translation, and comprehensive links.

Section 18.3 Review

1. *Define insourcing.*

Insourcing is defined as in-house development of applications.

2. *List some of the pros and cons of using packaged EC applications.*

Some of the benefits of using packaged solutions include the variety of available software, savings in time and money, reduced personnel requirements, defined product attributes, and a larger user base. Some of the disadvantages of using packaged solutions include inexact fit between software and the company, difficulty in modifying the software, loss of control over development, difficulties in integrating with existing systems, instability in vendors.

3. *Describe the major forms of application leasing.*

There are two types of application leasing. The first method allows the firm to lease the application and install it on an internal system. The application may or may not be supported by the lessor. The second method is to lease the application from an ASP that installs the application on their system.

4. *List some of the alternative leasing and hosting options.*

Some of the alternative leasing and hosting options include: electronic marketplaces, exchanges, auctions, reverse auctions, joint ventures, consortia, Internet malls, ISPs, television companies, and software houses.

Section 18.4 Review

1. *List some of the major criteria to consider when deciding whether to buy or lease an EC application.*

These criteria include: flexibility, information requirements, user friendliness, hardware and software resources, installation, maintenance services, vendor quality and track record, estimating costs, personnel, technological evolution, scaling, sizing, performance, reliability and security.

2. *Define latency.*

Latency is the time required to complete operations such as downloading a Web page.

3. *Define throughput.*

Throughput is the number of operations completed in a given period of time and indicates the number of users the system can handle.

Section 18.5 Review

1. *List the major features of an electronic catalog.*

Some of the common features include: templates for creating storefront pages, electronic shopping carts, Web-based order forms for secure purchases, a product database, and integration with third-party software.

2. *Describe the basic business systems in Microsoft's Commerce Server.*

This product offers a product catalog system, targeting system, profiling system, business processing pipelines system and a business analysis system.

3. *Describe the functions supported by IBM's WebSphere Commerce suite.*

IBM's product supports the following functions: order management, collaborative filtering, portal capabilities, localization, electronic coupons, and support for additional bundled products.

4. *Describe the key EC applications provided by Oracle for building B2C and B2B sites.*

These include Oracle iStore, Oracle Marketing, Oracle iPayment, Oracle Quoting, Oracle iSupport and Oracle Configurator.

Section 18.6 Review

1. *Describe the basic elements of a multitiered application architecture.*

A multitiered application architecture consists of four tiers: Web browsers, Web servers, application servers, and database servers.

2. *List the ways in which an EC application can be connected to back-end databases and other transaction processing systems.*

EC applications can be connected to databases in a variety of ways. Some of these methods include: using a multitiered application architecture, storing the information in legacy databases, integrating with other database systems, and integrating with other business systems.

Section 18.7 Review

1. *List some reasons why it is difficult for applications running in different environments on different computers to communicate with one another.*

Some reasons include the languages spoken by the applications and their ability to communicate due to security constraints.

2. *Define Web services.*

A software system identified by a URI (uniform resource indicator), whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition, using XML-based messages conveyed by Internet protocols.

3. *What role does XML play in Web services?*

XML can be a common language for passing requests and results.

4. *Describe the key technologies underlying Web services.*

Some of these technologies include XML, SOAP, WSDL and UDDI.

5. *What types of Web services do Amazon.com and Google offer application developers?*

Both firms offer users the ability to access their databases and relate that information on their Web sites.

6. *What are some of the advantages of Web services?*

Some advantages include the ability to more easily communicate components and the ability to modularize services.

7. *What are some of the factors limiting the adoption of Web services?*

Some factors include a lack of standards and security concerns.

Section 18.8 Review

1. *List the major steps in selecting an EC application vendor and package.*

The major steps include: identifying potential vendors, determining the evaluation criteria, evaluating vendors and packages, choosing the vendor and package, negotiating the contract, and establishing service level agreements.

2. *Describe a request for proposals (RFP).*

A request for proposal is a notice sent to potential vendors inviting them to submit a proposal describing their software package and how it would meet the company's needs.

3. *Describe a service level agreement (SLA).*

A service level agreement is a formal agreement regarding the division of work between a company and its vendors.

Section 18.9 Review

1. *List some of the statistics provided by an access log.*

Some of the statistics provided include: page views by time slot; page views by customers logged-in status; page views by reverse; page views by visitor's hardware platform, operating system, browser, browser version, and page views by visitors host.

2. *Describe some of the uses of an access log.*

Access logs can be used for all of the following: overall store performance, advertising, external referrals, shopper segmentation, product groupings, promotions and recommendations, shopping metaphor, design features, and product assortment.

Answers to EC Application Case Questions

EC Application Case 18.1: Hosting Services from Verio

1. *What are some of the major services provided by Verio?*

The core business is to provide a variety of hosting options.

2. *What are the value-added services offered by Verio?*

Some of these services include site promotion, load balancing, server monitoring, security, and system administration services.

EC Application Case 18.2: Floriculture Partnership Streamlines Real-Time Ordering

1. *What business problems were addressed by the FFA portal?*

It provided an easier and more efficient way to place and manage orders.

2. *What are the business benefits provided by the FFA portal?*

It reduced errors and created a better likelihood of successful orders/deliveries.

Answers to Discussion Questions

1. *Discuss the advantages of leasing an application over purchasing one.*

Leasing has several advantages. One of these advantages is the decrease in cost and time in the actual creation of the site. Additionally, leasing can spread the financial impact of the new system over time, making it easier for a company to absorb. Finally, leasing in many cases involves a higher level of support and service from the consulting group that lease the application, and this may be very beneficial to the firm.

2. *A large company with a number of products wants to start selling on the Web. Should it use a merchant server or an EC application suite? Assuming it elects to use an EC application suite, how would you determine whether the company should outsource the site or run it themselves?*

Student responses will vary. Students will weigh the benefits and disadvantages of both merchant servers and application suites as well as outsourcing or insourcing running the site.

3. *A large chemical manufacturing company is interested in starting an online exchange. What are some of the ways it could achieve this goal?*

The company has a wide variety of options. The company could build an exchange application, buy an existing application, or lease an existing application. Additionally, the firm could work with other firms to create the exchange, or join an existing exchange.

4. *A firm decides to make its EC Web site more dynamic by tying its application to a back-end database. What are some of the ways in which the firm could accomplish this task?*

The firm will need to link the data in the database to its Web site. This can be done by linking the actual database (using PHP or ASP for example) or using a Web service to communicate with the database (using XML for example).

5. *An online vendor selling wants to hook its shopping cart application to a credit card authorization Web site. How could this be done with Web services, and how would the authorization site advertise its services for other sites to use?*

The shopping cart would have to pass the order and credit card information to the authentications site through a Web service (probably using XML as the language). The authentication site would approve the transaction and pass the approval back to the shopping cart through a Web service. The authorization site might set up Web services compatible with several shopping carts to advertise its services.

6. *An enterprise wants to modify its EC site so that it conforms more closely with its overall business strategies. What sorts of online data are available for this purpose? What types of business strategy questions can be addressed by these data?*

The company can evaluate its system access logs and any EC management tools it may have. These tools will allow the firm to determine what type of customers visit their site,

what they view, what they purchase, and other specific information. If this information has been gathered correctly, it can assist the firm in answering a wide variety of questions pertaining to the current state of the EC application.

7. *In what ways do you think a Web site's log files violate your privacy?*

Student answers will vary.

8. *You have decided to use a third-party application to develop and deploy a sell-side B2B site. Create a checklist for determining which third-party EC application products will best meet your application requirements.*

Student answers will vary.

Internet Exercises

(Note: URLs may change over time; please check the Internet Exercises on the Turban Web site for possible updates: www.prenhall.com/turban.)

1. *Access the Choice Mall Web site (choicemall.com). Visit some of the online stores in the mall. What are the functionalities of the mall? What are some of the benefits of the online mall to the participating vendors? To shoppers? Do you think a shopper is better off using an online mall or using a search engine such as AltaVista to locate a store providing a product of interest? In what ways could Choice Mall improve the chances that buyers will make return visits?*

This site provides an aggregated catalog shopping system from a wide variety of merchants. This site has one integrated shopping cart. Participating vendors have the benefit of being part of a large mall where users can easily shop several different stores at one time. This is especially beneficial for small vendors who may not have a wide product variety to entice shoppers to a stand-alone site. Shoppers have the benefit of being able to select from a wide variety of products from wide variety of merchants while using a single shopping cart. Student responses will vary concerning the effectiveness of malls over searching for specific stores. The mall may improve return visits because of the wide variety of products available.

2. *Visit a large online storefront of your choice. What functions does it provide to shoppers? In what ways does it make shopping easy? In what ways does it make shopping more enjoyable? What support services does it provide?*

Student responses will vary.

3. *Enter hotwired.lycos.com/webmonkey and find the tracking tutorials. What is the difference between a "hit" and a "pageview"? Write a summary of the three*

tutorials—gathering data, using databases, and using pageviews.

A hit is a request for one Web document. This can include the Web page or the graphics contained in it. A page view is a request for one Web page. One page view may contain several hits. Student responses will vary concerning the summaries for tutorials.

4. Go to the WebTrends site (**webtrends.com**). What types of information does its Analysis Suite provide? How can this information be used to improve a Web site? What types of tracking information are not provided by this suite? (See Discussion Question 3, above.)

This firm provides a wide variety of information in its tracking tools. The name of the company's products has changed. Products provide a wide variety of services including information about customers' viewing and purchasing habits, incoming and outgoing traffic, hardware usage and a variety of other reports. This information could be used to improve a Web site by determining what customers are interested in, what systems need to be improved, and where performance may be lacking. This company has a wide variety of tracking software, that appears to fill several different purposes.

5. Visit IBM's site (**ibm.com**). Find its WebSphere product. Read some of the recent customer success stories. What makes this software so popular?

Student responses will vary.

6. Go to the World Wide Web Consortium's discussion of Web services architecture (**w3.org/TR/ws-arch**). Based on this discussion, what role does a UDDI play in Web services? If a company wants to publicize its Web services, what means are available?

Student responses will vary. UDDI acts as a directory of available Web services. Firms would advertise available services within the UDDI framework.

7. Visit Sun Microsystems (**sunmicrosystems.com**). What type of development platform does Sun provide for creating and deploying Web services? What are the capabilities and benefits of the platform?

Student responses will vary. Sun uses the Sun ONE™ platform to develop web services.

8. Visit the Microsoft Web site (**microsoft.com**). Find its Biztalk product. What kind of software is this? What role could it play in an EC application?

This product from Microsoft is a system that allows for the creation and transmission of XML documents. XML would be an ideal system to transport information between e-commerce sites, and information systems. XML documents could be used to move

information from database to database, from database to e-commerce system, and from e-commerce system to legacy EC system.

9. Go to **covisint.com**. What is Covisint? Who are the partners involved in Covisint? What types of B2B functionality does it provide? Based on the press releases at Covisint's Web site, has Covisint been successful? Why or why not?

This firm is an online exchange that provides supply chain integration services as well as sales of automobile parts. The firm has a wide variety of partners including a majority of the large automobile manufacturers in the world. The firm allows for buying and selling of parts supplies for this industry. Based on the press releases, it appears that this company has been successful because it has been able to provide service that is necessary for automobile manufacturers through the use of innovative electronic commerce technology.

Team Assignments and Role Playing

1. Select a series of Web sites that cater to the same type of buyer (e.g., several Web sites that offer CDs or computer hardware). Divide the sites among the teams and ask each team to prepare an analysis of the different sorts of functions provided by the sites, along with a comparison of the strong and weak points of each site from the buyer's perspective.

Student reports will vary.

2. Several vendors offer products for creating online stores. The Web sites of these vendors usually list those online stores using their software (customer success stories). Assign each team a number of vendors. Each team should prepare reports comparing the similarities and differences among the vendors' sites and evaluating the customers' success stories. Do the customers take advantage of the functionality provided by the various products?

Student reports will vary.

3. As a team, explore the desired capabilities of various EC applications (B2B, B2C, auctions, portals G2C, etc.). Look at the capabilities of these applications and at their functionalities, and then compare the two. (See Section 18.3 for a list of functionalities.) If the functionalities of the applications are not sufficient, explain what additional functionalities are needed.

Student reports will vary.

4. Amazon.com (**amazon.com/webservices**) provides Web services for its

Associates, as well as other product sellers and vendors. Assign one team to explore the services for Associates and another to the services for sellers and vendors. Describe the services provided by each. What are the benefits of these services? Who are some of the companies that are currently using these services? Go to their sites and describe how they are using these services.

Student reports will vary.

End-of-Chapter Real-World Case Questions: Whirlpool's Trading Portal

1. *From Whirlpool's point of view, what kind of a B2B application is this: e-procurement, sell-side, collaborative commerce, or other? Justify your answer.*

It is possible to categorize this application as all of the above models. It provides for electronic procurement by allowing existing partners to make routine purchases through the Web sites instead of through other means. Additionally, it could be considered collaborative commerce by providing functionality and collaboration to a group of distributors that had been overlooked in the past.

2. *Why did Whirlpool decide to utilize third-party applications with its second-generation portal? Explain in detail.*

The company decided to use third-party applications to speed development of the system. The firm chose to focus on their core abilities and not on a store's development of an EC application. The company did not want to develop portions of the application itself, rather it wanted to procure them from an industry leader.

3. *Imagine you are in charge of selecting the third-party applications to be used with the second-generation portal. What sorts of criteria would you use in making your choice? How did IBM's WebSphere meet these criteria?*

Student responses and criteria will vary, affecting the answer concerning IBM's product.

4. *How can Whirlpool leverage this application with other B2B processes?*

Student answers will vary.