

CHAPTER 9

Electronic Commerce Software



Twelfth
Edition

ELECTRONIC COMMERCE

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Learning Objectives

In this chapter, you will learn:

- How to find and evaluate Web-hosting services
- What functions are performed by electronic commerce software
- How electronic commerce software works with database and ERP software
- What enterprise application integration and Web services are and how they can be used with electronic commerce software

Learning Objectives (cont'd.)

- Which types of electronic commerce software are used by small, medium, and large businesses
- How electronic commerce software works with customer relationships management, knowledge management, and supply chain management software

Introduction

- Case study: Harry Barker
 - Sells pet products online
 - Prepared in advance for an expected increase in online orders from a *Good Morning America* segment
 - Added an additional Web server
 - Hired additional temporary staff
 - Created a customer Web page
 - Company followed up to measure how well it met new customer expectations

Web Hosting Alternatives

- Self-hosting is running servers in-house
 - Most often used by large companies
- Third-party Web-hosting service providers offer Web services, electronic commerce functions
 - Often used by midsize, smaller companies
- Commerce service providers (CSPs) provide Internet access and Web-hosting services
 - Offer Web server management and rent application software
 - Also called Managed service providers (MSPs) or Application service providers (ASPs)

Web Hosting Alternatives (cont'd.)

- Web-hosting service options
 - Shared hosting means client's Web site on a server hosting other Web sites simultaneously
 - Dedicated hosting means the client Web server not shared with other clients
 - Service provider owns and maintains server hardware, leases it to client, and provides Internet
- With co-location (collocation or colocation) service the provider rents physical space to client with a reliable power supply, Internet connection
 - Clients install/maintain server hardware and software

Web Hosting Alternatives (cont'd.)

- Web server-hosting decisions
 - Hardware platform and software combination
 - Should be upgradable when site's Web traffic increases
 - Scalable hardware and software combinations
 - Adaptable to meet changing requirements

Basic Functions of Electronic Commerce Software

- All electronic commerce solutions must provide
 - Catalog display, shopping cart capabilities and transaction processing
- Larger complex sites may include software with added features and capabilities

Catalog Display Software

- Catalog organizes goods and services being sold
 - May organize by logical departments
 - Web store advantage is a single product may appear in multiple categories
- Catalog is a listing of goods and services
 - Static catalog is a simple list written in HTML
 - Must edit HTML to add or delete items
 - Dynamic catalog stores information in a database with photos, detailed descriptions and a search tool for locating item and determining availability
 - Both located in third tier of Web site architecture

Shopping Cart Software

- Early electronic commerce used forms-based shopping
 - Shoppers selected items by filling out online forms which was awkward if ordering more than one or two items and error prone
- Electronic shopping carts are now standard
 - Keep track of items customer selected and allows them to view cart contents, add and remove items
 - Ordering requires a simple click which executes the purchase transaction
 - Screen asks for billing and shipping information

Shopping Cart Software (cont'd.)

- Web is a stateless system that does not retain information from one transmission to another
 - Shopping cart software must store information
 - Cookies allows information to be stored and retrieved
 - If browser does not allow cookie storage software automatically assigns temporary number
- Dynamic pricing management software adjusts prices in real time based on variables seller chooses
- Promotion management software allows sellers to create special offers on specific products

Shopping Cart Software (cont'd.)

- Fulfillment integration software connects seller's shopping cart to fulfillment provider's computer
 - Shipping automatically triggered at completed sale
- Product review management software allows customers to post reviews of products
- Product recommendation triggers are tools that respond to customer's product selection
 - Provides suggestions for related products, refills
- Abandoned cart management software enables shopping cart to be retained for later when customer session is terminated

Gary's Tool Shed

Home Specials Product Type Our Company View Cart

Tools By Type

- > Drills
- > Hand Tools
- > Sanders
- > Saws

Quantity	Item Name	Number/SKU	Each	Total
<input type="text" value="1"/>	9.6V 3/8" Cordless Driver/Drill with case & flashlight	FDS10DVAK	\$89.00	\$89.00
<input type="text" value="1"/>	18V Hammer, Drill, Saw Combo Pack	DW4PAK-2	\$499.00	\$499.00

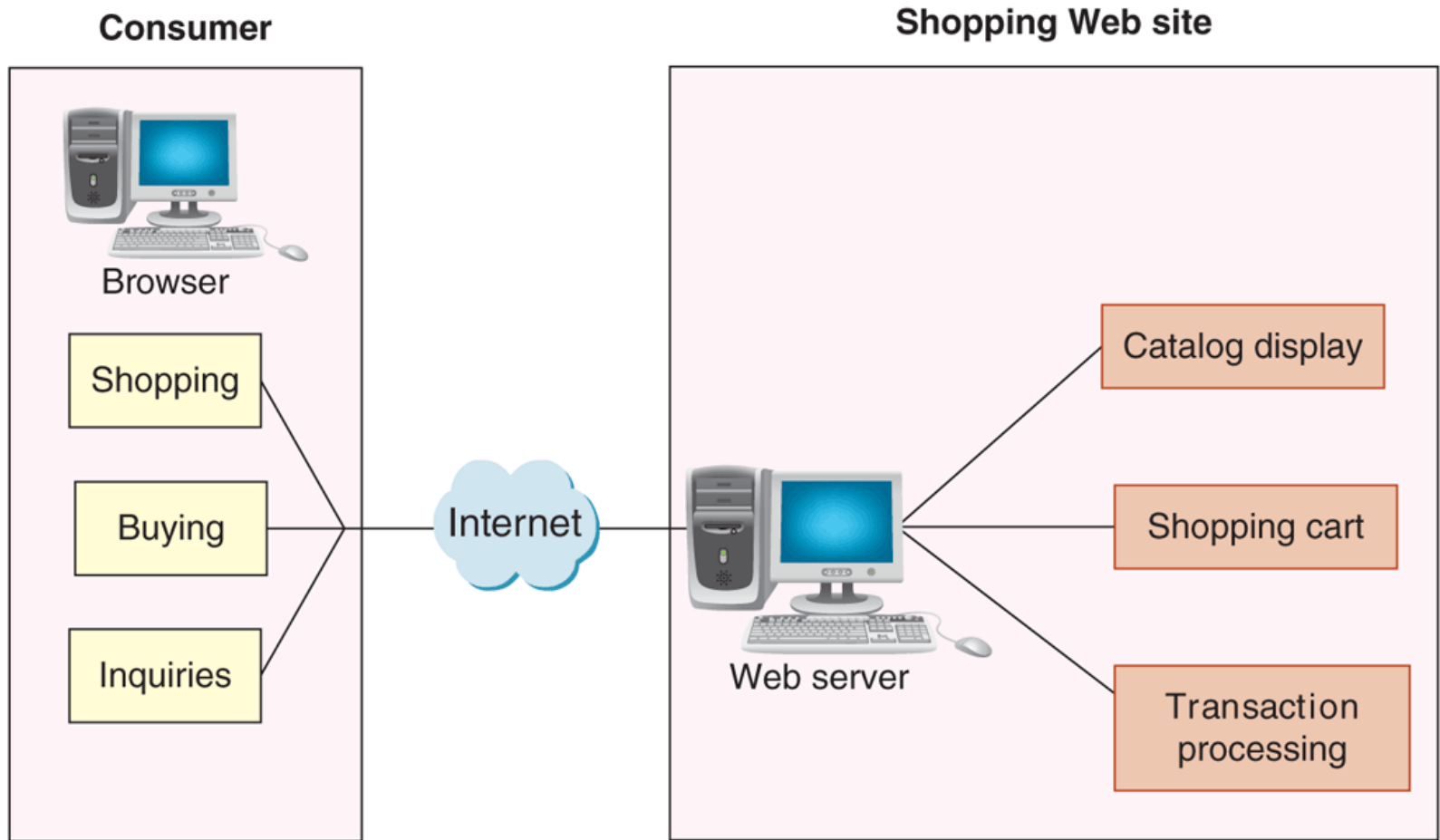
Product Total	\$588.00
Discount	-\$29.40
Subtotal	\$558.60
Total	\$558.60

[continue shopping](#) [checkout ▶](#)

FIGURE 9-1 Typical shopping cart page

Transaction Processing

- Occurs when shopper proceeds to virtual checkout counter by clicking the checkout button
 - Electronic commerce software performs calculations
- Web browser software and seller's Web server software switch into secure communication state
 - Electronic commerce software communicates with accounting software sales and inventory modules
 - FedEx and UPS shipping rate software integrates with electronic commerce software
- Other calculations include coupons, promotions, time-sensitive offers



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FIGURE 9-2 Basic electronic commerce site architecture

How Electronic Commerce Software Works with Other Software

- Most large companies with electronic commerce operations also have substantial business activity unrelated to electronic commerce
 - Important to integrate electronic commerce activities into the company's other operations
- Basic information system element is a collection of databases

Databases

- Highly structured information stored on a computer
- Business rules are how the company does business
- Database management software allows users to enter, edit, update, retrieve database information
- Distributed information systems are large systems storing data in many different physical locations
 - Distributed database systems are databases within distributed information systems
- MySQL database is open-source software owned by Oracle and maintained by group of programmers

Middleware

- Middleware takes sales and inventory shipments information from electronic commerce software
 - Transmits to accounting and inventory management software
 - Companies can write their own or purchase customized middleware
- Interoperability is making information systems work together
- Middleware cost range is \$30,000 to several millions
 - Depending on complexity and existing systems

Enterprise Application Integration

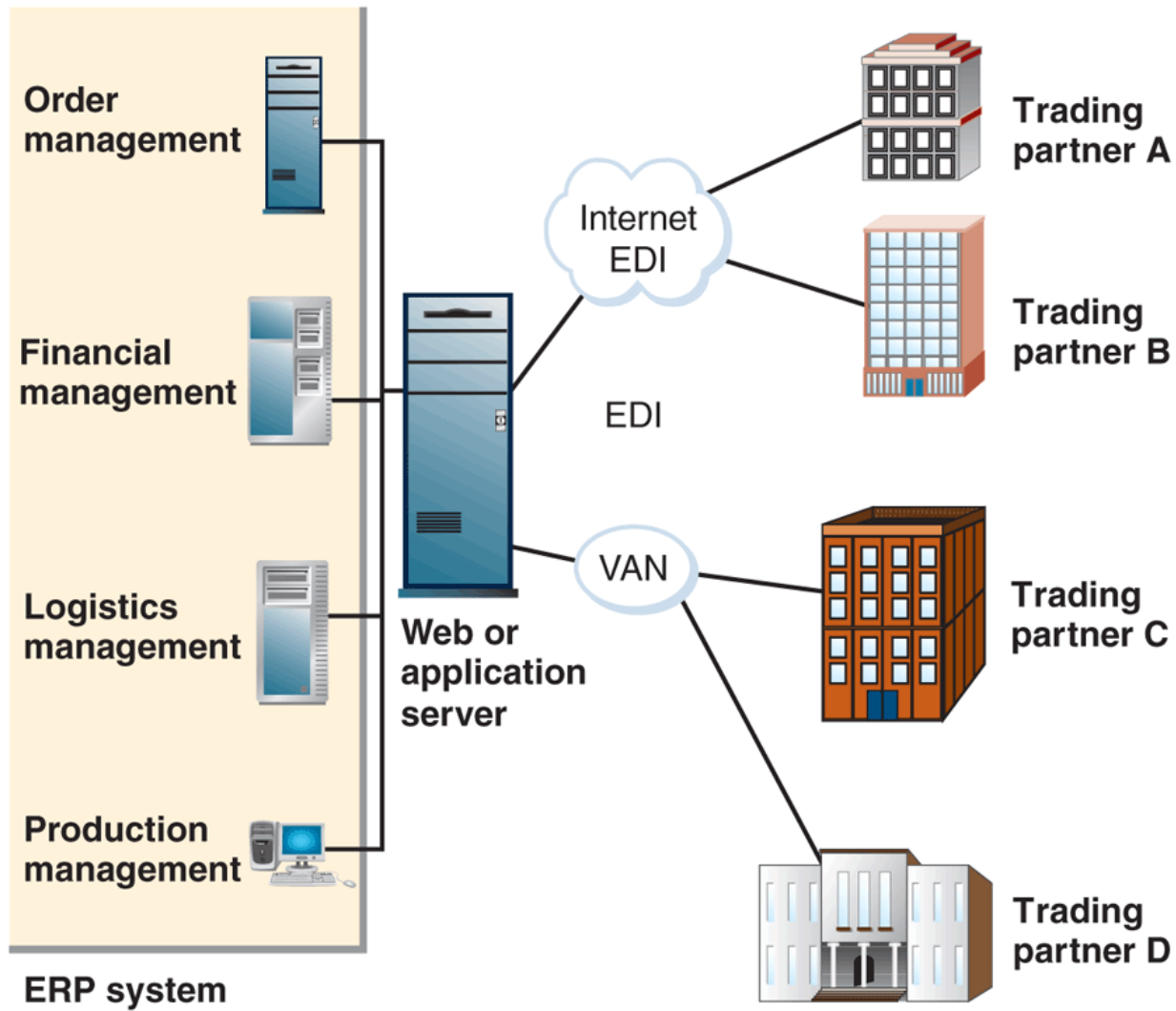
- Application software (application) is a program that performs specific function like creating invoices
- Application server (computer) takes request messages received by Web server
 - Runs application program performing action based on request message's contents
 - Actions determined by business logic rules such as verifying customer password upon log in
- Enterprise application integration is a creation of links among scattered applications so business logic can be interconnected

Enterprise Application Integration (cont'd.)

- As information is transferred from one application to another program data formats differ
 - Must edit and reformat often using XML data feeds
- Page-based application systems return pages generated by scripts containing rules
 - Present data on Web page with the business logic
- Component-based application systems separate presentation logic from business logic
 - Logic components created and maintained separately
 - Updating and changing system elements much easier

Integration with ERP Systems

- Enterprise resource planning (ERP) software are business systems integrating all facets of a business
 - Accounting, logistics, manufacturing, marketing, planning, project management, and treasury functions
- Two major ERP vendors: Oracle and SAP
 - ERP software installation costs between \$1 million and \$10 million for a midsize company
- Smaller online businesses can purchase products like NetSuite that offer ERP system subscriptions
 - Called software as a service (SaaS)



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FIGURE 9-3 ERP system integration with EDI

Web Services

- Software systems supporting interoperable machine-to-machine interaction over a network
 - Set of software and technologies allowing computers to use the Web to interact with each other directly
 - Does not require human operators directing the specific interactions
- Application program interface (API) is a general name for the ways programs interconnect with each other
 - Web APIs: interaction over the Web

What Web Services Can Do and How Web Services Work

- Offer improved customer service, reduced costs
- Transmit XML-tagged data from one enterprise integrated application to another
- Provide data feeds between two different companies
- Programmers write software accessing business application logic units without knowing details
 - Allows communication between programs written in different languages on different platforms
 - Example task: transaction processing
 - Can be combined with other Web services for complex tasks

How Web Services Work (cont'd.)

- Machine-to-machine communication was originally accomplished with HTML but now most are XML
- First Web services information sources programmers incorporated into software applications
- More advanced example is purchasing software used to obtain vendor price information
 - Purchasing agent authorizes transaction and Web services submits order and tracks until delivered
- As Web servers become more sophisticated, they can often make decisions themselves

Web Services Specifications

- Simple Object Access Protocol (SOAP) is a message-passing protocol
 - Defines how to send marked up data from one software application to another across a network
- Utilizes three rule sets
 - Communication rules included in SOAP specification
 - Web Services Description Language (WSDL) describes logic unit characteristics of each Web service
 - Universal Description, Discovery, and Integration Specification (UDDI) works as address book to identify Web services locations and associated descriptions

REST and RESTful Design

- Representational State Transfer (REST)
 - Principle describing how the Web uses networking architecture to identify and locate Web pages and elements making up those Web pages
- RESTful design (RESTful applications) are Web services built on the REST model
 - Transfers structured information from one Web location to another
 - Services accessible at a specific address
 - More than half of all Web services today are RESTful applications

Electronic Commerce for Small and Midsize Businesses: Basic CSPs

- Use of service provider's shared or dedicated hosting services
 - Shifts staffing burden from company to Web host
 - Spread costs over all hosted businesses
 - Host provider keeps server working through storms and power outages
- CSPs offer free or low-cost e-commerce software
 - Less than \$20 per month with software built into site
- CSP examples
 - Gate.com, ProHosting.com, 1&1 Internet, Yahoo!

Mall-Style CSPs

- Provide small businesses with basic Web site, online store design tools, templates and easy-to-use interfaces
 - Low monthly fee, one-time setup fees and percentage (or fixed) amount for each transaction
 - Shopping cart software and payment processing
- Two-main mall-style CSPs are Amazon services for business and eBay stores for businesses
 - No long term commitment and few up-front costs

Estimating Operating Expenses for a Small Web Business

- Cost to become operational between \$400 and \$8200
 - Assumes less than 100 items for sale and business already has computer and Internet access
 - Figure 9-4 shows the range of estimates for first-year expenses for a small business owners
- Self-hosting include one time basic server and router costs of \$2000 to \$10,000 plus annual costs
 - Basic Internet connection: \$480 to \$1,800
 - Secure server room: \$5000
 - Required technicians: \$50,000 to \$100,000
 - Annual total costs: \$60,000 to \$100,000

Operating Costs	Cost Estimates	
	Low	High
Initial site setup fee	\$ 0	\$ 200
Annual CSP maintenance fee (12 x \$20 to \$300)	240	3600
Domain name registrations	0	300
Scanner for photo conversion or digital camera	60	2000
Photo editing software	0	800
Occasional HTML and site design help	100	1100
Merchant credit card setup fees	0	200
Total first-year costs	\$400	\$8200

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FIGURE 9-4 Approximate costs to put a small store online

Electronic Commerce Software for Midsize Businesses: Web Site Development Tools

- Possible to use Web page creation and site management tools from Chapter 2
- After Web site creation add purchased software elements and create the middleware

Midrange Electronic Commerce Software

- Costs \$5000 to \$200,000
- Operating costs range \$1000 to \$30,000 annually
- Offers connectivity to database or ERP systems that store inventory information
- Intershop offers midrange packages
 - Include search and catalog capabilities, electronic shopping carts, credit card processing and connection to back-end businesses and databases
 - Setup wizards, catalog tools, data management functions and built-in templates are included
 - Manage storefronts with Web browser interface

Midrange Electronic Commerce Software (cont'd.)

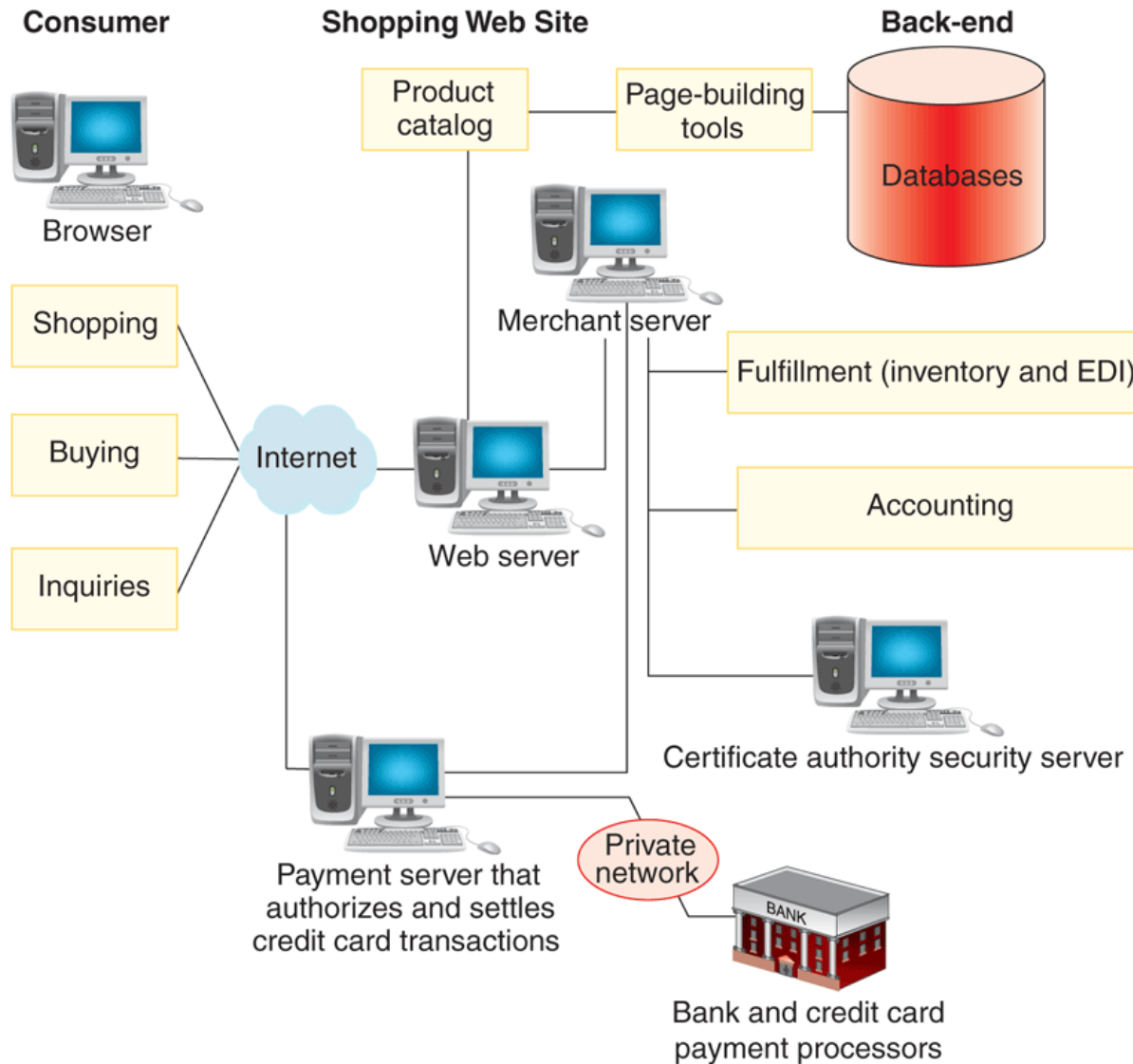
- IBM WebSphere Commerce Professional is a family of software components
 - Includes catalog templates, setup wizards, advanced catalog tools
 - Provides link with existing corporate systems
 - Inventory databases, procurement systems
 - Customization requires programmers with JavaScript, Java or C++ expertise
 - Costs between \$50,000 and \$300,000 depending on number of servers and options

Electronic Commerce Software for Large Businesses

- Larger business requirement many of the same advanced capabilities as midsize firms
 - Need ability to handle higher transaction loads and dedicated software applications to handle specific online business elements
- Enterprise-class commerce software is used in large online business operations
 - Encompasses all areas of the business or enterprise
 - Provides tools for B2B and B2C commerce
 - Interacts with wide variety of existing systems
 - Costs: \$200,000 to \$10 million

Enterprise-Class Electronic Commerce Software

- Requires several dedicated computers, Web server system, firewalls
 - IBM WebSphere Commerce Enterprise, Oracle E-Business Suite and Broadvision
- Provides tools for linking to and supporting supply and purchasing activities
 - Secure transaction processing and fulfillment
 - Interaction with firm's inventory system to issue purchase orders
 - Generate accounting entries
 - Download electronic goods directly from site



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FIGURE 9-5 Typical enterprise-class electronic commerce architecture

Content Management Software

- Helps control large amounts of text, graphics, media files that have become crucial to doing business
 - Increased use of social media and networking as part of online business operations
- Software should be tested before commitment
 - Straightforward procedures for regular maintenance
 - Facilitates typical content creation tasks
- Leading providers include IBM and Oracle
 - Costs between \$50,000 and \$500,000
 - Can cost 3 to 4 times that amount to customize, configure and implement

Knowledge Management Software

- Systems that manage knowledge itself rather than the documentary representations of that knowledge
 - Collect, organize and share knowledge
 - Enhance collaboration and preserve knowledge gained through information use to benefit future users
- Tools to read documents and conduct searches
 - Use proprietary semantic, statistical algorithms
- Collects knowledge elements by extracting them from normal interactions users have with information
- Implementation costs \$10,000 to \$1 million or more

Supply Chain Management Software

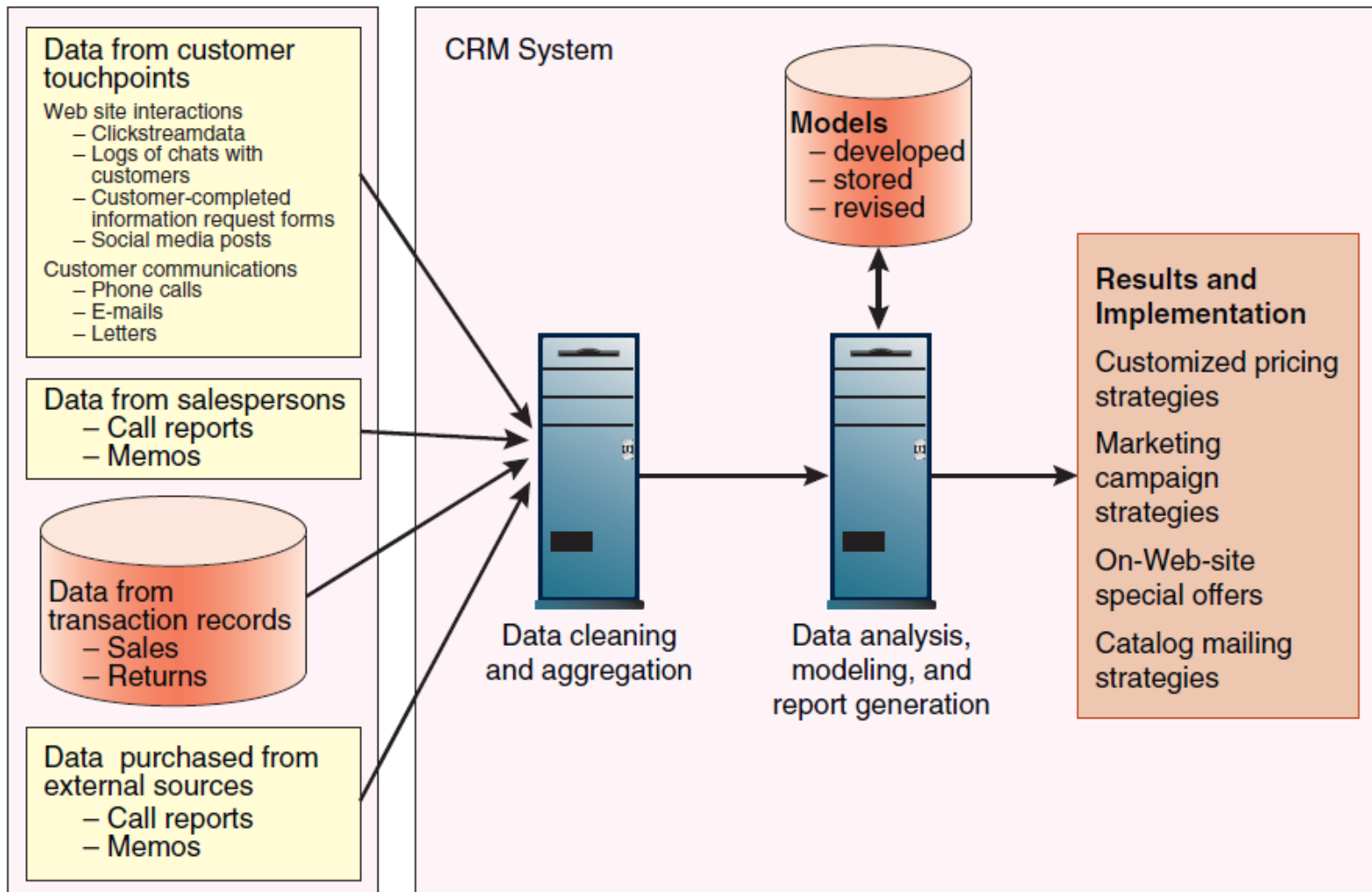
- Helps coordinate planning and operations with supply chain partners
 - SCM planning software develops coordinated demand forecasts
 - SCM execution software helps with warehouse and transportation management
- SCM software components manage demand and supply planning and demand fulfillment
- Cost of SCM software implementations varies tremendously based on number of locations
 - Range from under \$300,000 to \$5 million

Customer Relationship Management Software

- Goal is to understand customer's specific needs and customize product or service to meet those needs
 - Idea is if customer needs are met exactly they will pay more for goods or services
- Software must obtain data from operations software and gather data about customer activities
 - Use data to conduct analytical activities
- Basic form of CRM uses customer information to sell more goods or services
- Advanced form of CRM delivers attractive, positive customer experiences

Customer Relationship Management Software (cont'd.)

- Important in maintaining customer loyalty when purchase process is long and complex
- From 1996 to 2000 companies spent millions to buy systems and restructure customer strategies
 - Bad experiences led to a change in thinking
- Now used to solve smaller, more specific problems
 - Popular target is call center operations
- Some companies create their own but most buy a software package
 - Prices start around \$2000 and large implementations can cost millions



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FIGURE 9-6 Elements of a CRM system