Exam Manual

LearnSmart

(1D0-525)

CIW v5

E-Commerce Designer

This LearnSmart exam manual is designed to bolster your confidence by breaking down the most important concepts on the CIW v5 E-Commerce Designer exam (1D0-525). By studying this manual, you will become familiar with an array of exam-related content, including:

- Evaluating an e-commerce site to maximize audience usability
- Developing a knowledge base
- Securing e-commerce transactions
- Identifying legal and governmental issues in e-commerce
- And more!

Give yourself the competitive edge necessary to further your career as an IT professional and purchase this exam manual today!

V5 E-Commerce Designer (1D0-525) LearnSmart Exam Manual

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Abstract

This Exam Manual will help prepare the reader to pass the certification exam for IDO-525 v5 CIW E-Commerce Designer; The exam objectives for this certification are based on a combination of technical and non-technical skills and knowledge. The questions on the exam are not vendor or product specific. The exam consist of 72 questions from the following domains:

Domain 1: E-Commerce Site Development – 25 questions
Domain 2: E-Commerce Technology and Security – 33 questions
Domain 3: E-Commerce Business, Marketing and Legal Issues – 14 questions

What to Know

The CIW e-Commerce exam is the last exam of the CIW Master series and is one of the most difficult of the entry level examinations. On the CIW exam, you will be not only tested in your knowledge of the web and the technologies therein, but also on the fiscal technology that drives the internet and the eBusiness world in total. Frequently, students will try to combine this exam with other exams, such as CompTIA's i-Net+, that can be used on the CIW Master path as an exam substitution. However, it is not required. Overall, you should just make sure that before you take the exam that you are well prepared for any obstacles that might come your way concerning web and e-Commerce administration.

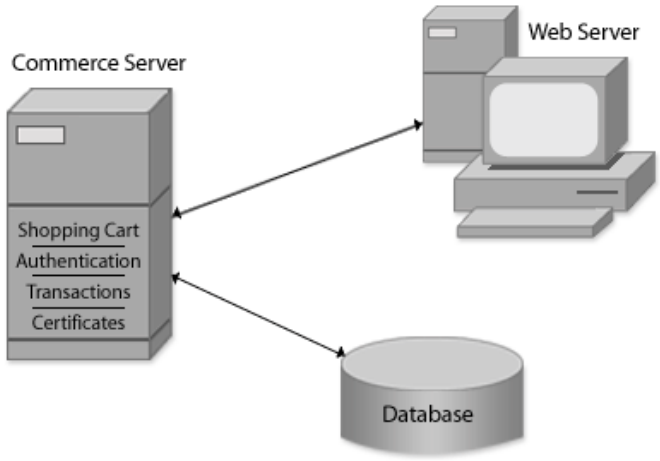
Tips

Preparing for a certification exam is challenging. The following will help you prepare for the challenge:

- Identify your learning style
- If you are using exam simulation software do not over use it. Once you memorize the questions, you may have a false sense of security
- Choose a place to study
    - Keep distractions away from your study area
    - Turn your phone off and lock the door
    - Make sure you have sufficient space to spread out materials
    - Choose an environment that is conducive to studying
    - Make sure rest is on the study schedule
- The Night Before the Test
    - Don't second guess yourself
    - Get lots of sleep, well try anyway
    - Do not stay up cramming. You know your stuff, have confidence!
    - Go to dinner with someone, spend time talking about anything but the test
    - Go take a walk, clear your head
    - Set your alarm, set multiple alarms

- The Day of the Test
  - Eat a light meal before you go.
  - Review your outlines.
  - Make sure you have the ID required to gain access. If they say 2 forms of ID w/picture, they mean it.
  - Show up early for the test, but not so early that you increase your anxiety waiting ~15 minutes.
  - When you arrive, use the bathroom. That way you won't be distracted later.
  - Do not mingle with other test-takers, their anxiety is catching.

Domain 1.0 – E-Commerce Site Development - 35%



1.1 Evaluate an e-commerce site to maximize audience usability.

Usability

The goal of usability is to determine the extent that the site is effective, efficient and trouble-free for a user. This is accomplished through careful planning and strategic design.

Four Goals for Effective Usability

- **Goal 1: Get the user to the site.**
  - Promote the site or product through online advertising, referrals, offline marketing, etc,
- **Goal 2: Provide search features for locating products or services.**
  - Locate product or services through a hierarchy of hyperlinks
  - Use a search engine
- **Goal 3: Meet the user's purchasing needs.**
  - Provide detailed product or service options
  - Define links to information clearly
  - Limit the amount of information
- **Goal 4: Close the sale.**
  - Convert the shopper into a buyer
  - Provide a shopping cart or other payment system
  - Offer anonymous purchasing

Usability Testing Methods

Usability testing should be performed at the design, development and maintenance stages. The methods chosen are determined by the site's content, potential customers and the amount of money budgeted for this type of testing. Five methods exist: paper-based walkthroughs; personas and role playing; live usability testing; field testing; and click patterns.

Testing Methods:

Usability Testing Method	Description
Paper-based walkthroughs	An initial design test that sketches the site's hierarchy and layout.
Personas and role playing	Create target users and role-play each user's use of the site. Each user should meet the site's audience expectations.
Live usability testing	Requires two participants. One participant acts as the live user, while the second participant tracks the user's activities in achieving a specific goal. This method helps designers determine problem areas and assess the computer literacy required by the user to achieve the goal.
Field testing	Requires evaluation of users in their native environment. Most expensive method.
Click patterns	Paths traveled by users are determined by the links the user clicks. These clicks can be divided into navigational patterns or random patterns. Pattern analysis can yield information on the navigability of the site, the user's ability to readily find the product or service and where a user leaves the site when a purchase is not made.

Analyzing Click Patterns

Click patterns come in two forms: random-click and controlled-click. Each pattern provides information on the user's interaction with the site. Analyzing these patterns helps the designer work through site navigation issues and helps ensure that the user finds the product or service sought.

Random-click Pattern

- Find the most commonly traveled paths
- Identify the links users prefer to click
- Identify paths that result in the user exiting the site (broken links, page not found, etc.)

Controlled-click Pattern

- Directs the user down a certain path or in a specific pattern
- The site's design controls the click pattern by limiting options
- Identifies navigational issues
- Differentiates between returning and new customer patterns

Click Pattern Analysis Sample

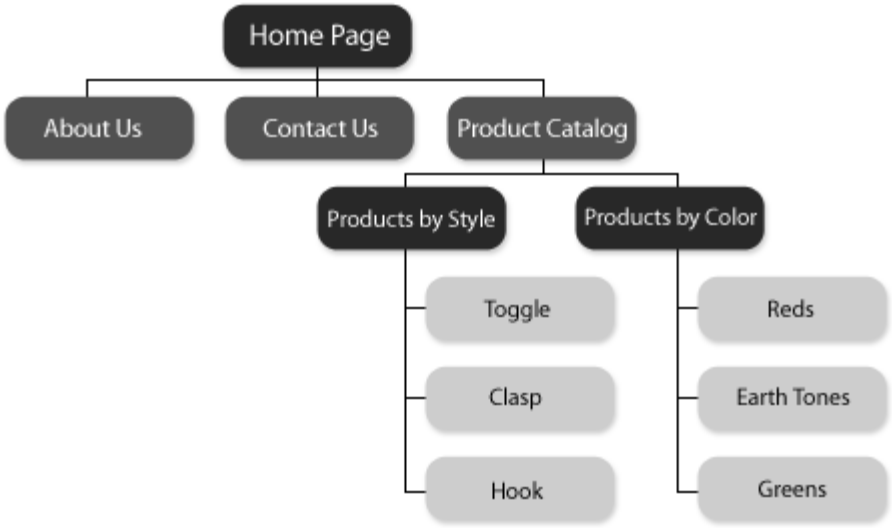
VISITOR ANALYSIS	
Referring Link	http://www.chromezebra.com/pages/harassmenttraining.htm
Host Name	gatekeeper.athenahealth.com
IP Address	209.202.183.250
Country	United States
Region	Massachusetts
City	Waltham
ISP	Savvis
Returning Visits	0
Visit Length	41 seconds
VISITOR SYSTEM SPECS	
Browser	MSIE 6.0
Operating System	Windows XP
Resolution	1024x768
Javascript	Enabled

Navigation Path

Date	Time	WebPage
1st June 2006	08:20:15	chromezebra.com/pages/catalog.htm www.chromezebra.com/pages/harassmenttraining.htm
1st June 2006	08:20:41	chromezebra.com/pages/certifications.htm chromezebra.com/pages/catalog.htm
1st June 2006	08:20:56	www.chromezebra.com/pages/catalog.htm chromezebra.com/pages/certifications.htm

Web Site Hierarchy

This refers to the organization of information on a web site. It defines the relationship between pages and customer navigation.



1.2 Develop and host an e-commerce site using instant storefront services and stand-alone e-commerce software.

Commerce servers: Selection considerations

The following features should be considered when choosing commerce software:

- Target audience/application
  - Ask: Is the server software designed to support B2C, B2B or both?
- Site design tools and language compatibility
  - Ask: How flexible is this product? What skills are required to implement this software?
- Available Web components
  - Ask: What components does this commerce server support?
- Automated transaction processing
  - Ask: Does this software support automated transaction processing? What type of payment processing, currency conversion and tax calculations does it perform?
- Workflow design and automation
  - Ask: Does this software support process automation, or is a separate server required?

- Prerequisites
  - Ask: What are the hardware and operating system requirements for installation? Will a database server be required?
- Analysis capabilities
  - Ask: What type of reports and data are generated? Can the data be exported in its raw form?
- Security modules
  - Ask: Does this server software have a good security track record? What security features are built in?
- Server Performance
  - Ask: How should this server software be implemented to insure high performance?

E-Commerce Solutions

There are two choices for implementing an online business: in-house solutions and instant storefronts.

In-House Solution
This solution requires considerable expense and depth of hardware, software, and network implementation knowledge. The online business is controlled and maintained by the business itself.

Instant Storefront Solution
Storefront software packages provided by a vendor can create an instant storefront. This type of solution requires minimal technical knowledge and is much less expensive than an in-house solution. Two types of instant storefronts are online and offline (hybrid):

- **Online** – the entire package resides on the vendor or service provider's server.
- **Offline (hybrid)** – the software resides on the business' computer system where the site is created and maintained, and then uploaded to the web server.

Storefront Creation Packages

E-Commerce site creation packages can be broken down into the following three categories:

- Online Instant Storefront: Entry level
- Mid-level Offline Instant Storefront
- High-level Instant Storefront

Considerations When Choosing a Site Creation Package

Budget	Products	Features	Site Hosting
Initial Outlay Recurring Charges Per-product fees Transaction fees	Number of products Types of products Product information Availability Pricing structure	Search engine listing Customization level Customer management Security Order/Transaction tracking Inventory	Outsourced/In-house Database requirements Disk space Operating system Security Certificates

Online Instant Storefront: Entry Level Company

- Types:
  - Independent storefronts
    - Allows the use of a fully qualified domain name (FQDN)
    - Fully independent and accessible to customers
  - Portal or community storefront
    - The store is listed in the portal site's directory
    - Less customization and flexible payment options
- Advantages:
  - Easy implementation and administration
  - Inexpensive
  - Minimal hardware requirements (hosted on an Internet hosting service)
- Disadvantages:
  - Owner control is minimal

Mid-Level Offline Storefront – Small to Midsize Company

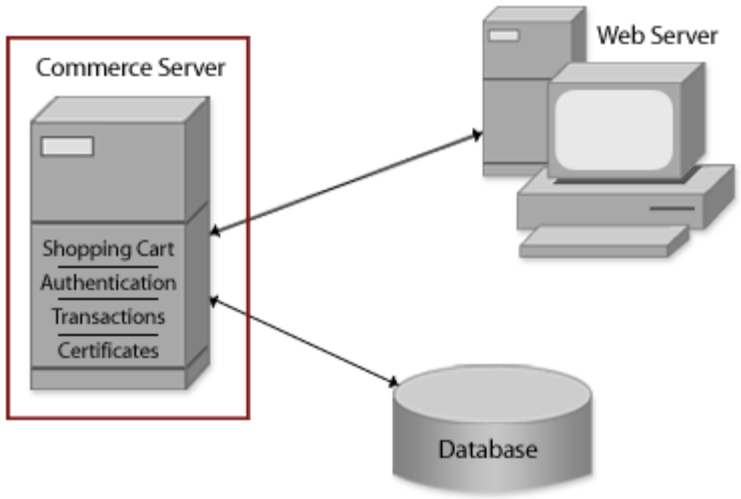
- Advantages:
  - Must be installed locally
  - Design work is done locally, then uploaded to the Web server
  - Fairly low learning curve
  - Somewhat customizable
  - Provides multiple payment options
  - More control over administration

- Disadvantages:
  - More expensive than an instant storefront
  - Requires more hardware resources
  - Requires significant level of experience

High Level Offline Storefront - Mid to Large Company

- Advantages:
  - Highly customizable
  - Provides high security
  - Absolute control over storefront and administration
- Disadvantages:
  - Most expensive to purchase and administer
  - Requires expertise in the area of administration and support
  - Requires dedicated hardware resources

Commerce Servers



IBM WebSphere suite

This is a collection of business applications and application development environments. This suite includes Commerce Suite. It is used to develop complex storefronts and online catalogs for small to mid-size business. This software runs on Windows, Solaris, and OS390 platforms and is optimized for use with IBM, Netscape, and Lotus Domino Web servers.

Sun ONE Integration Server

This is a platform that combines many software applications for buying, selling and billing to create a commerce solution. This server is standards-based and supports XML, XSL Transformations, EDI and JMS.

NetSuite

NetSuite provides separate, targeted commerce development tools. It also provides a scalable solution for small, mid-size and enterprise commerce sites. Additional functions are provided through modules. This is a web-based solution.

osCommerce

This is an open source (free), ready-to-run, easy-to-use commerce solution. It supports PHP scripting and MySQL database server; it is optimized for Apache Web server, but runs on Windows, Macintosh OS X, Solaris and Linux. osCommerce provides multilingual support and modules for extending the function of the storefront.

Commerce Server 2002

Commerce Server 2002 (C2002) is a robust web server product that creates Internet commerce enabled Web applications. It provides a dynamic mid-level storefront designed for mid-size and large organizations. C2002 provides "ready-to-run" solutions in templates that will build most of the commerce structure.

C2002 is **made up** of five server systems:

- **Product Catalog System**
  - Maintains a hierarchical catalog and product category structure
- **Profiling System**
  - Manages user registration and tracking, including both individuals and business entities
- **Business Process Pipelines System**
  - Manages custom business processes such as automated ordering processes
- **Targeting System**
  - Enables automated personalization, such as discounts or directed promotions, based on user and business entities properties
- **Business Analytics System**
  - Used with database warehousing to perform detailed analysis and reporting

C2002 is **managed** through three main interfaces:

- **BizDesk**
  - Creates online catalogs
  - Manages user accounts
  - Analyzes applications
  - Manages campaigns and profiles

- **Commerce Server Manager**
  - Administers multiple site resources and properties
- **Pipeline Editor**
  - Defines business processes and sequencing requirements

Online Catalogs

An online catalog supports multiple levels, or categories, of products or services. It should be designed to be searchable and personalized. The catalog categorizes products and defines many-to-many relationships between the products.

Building a Well-Designed Online Catalog

- Identify business objectives
  - Is the catalog meant to attract new business?
  - Service existing customers quickly?
  - Provide additional information?
- Build slowly
  - Begin with a simple catalog and move into more complex catalogs
- Categorize data properly
  - Organize products carefully
  - Identify many-to-many product relationships
- Determine which information to store
  - Weigh the benefits of product information with the time and effort required to produce content
  - Import the information into the database

Building a Catalog Using Commerce Server 2002

Commerce Server 2002 can create a catalog of patent categories, subcategories and products. To create the catalog, a catalog definition must first be in place. This can be created by the Catalog Definition Designer in Commerce Server or by importing a CSV or XML file that contains the required definitions.

Catalog definitions must contain three elements:

- **Property definitions**
  - Assign attributes such as color, weight or size
  - Designated as required or optional
  - Defines multilingual data types
    - Multilingual Text: holds short textual information
    - Multilingual Long Text: holds long text
    - Multilingual Multiple Choice: used for attribute choices
    - Multilingual File Name: file reference based on language
- **Product definitions**
  - Describes types of information for each product
  - Contains the name, type and properties of the product
  - Includes the list price property
  - Contains a unique identifier for each product
- **Category definitions**
  - Specifies the properties that define a category
  - Group together a series of product definitions
  - Contain any number of product definitions

Building the Base Catalog

A base catalog is a database that contains the actual product data. Products are stored in one or multiple base catalogs. This catalog can be created by using the New Base Catalog feature in Commerce Server or by importing a CSV or XML file.

Steps:

1. **Design the category hierarchy**
   - Determines the navigation for the web site
2. **Define category relationships**
   - Relationships define products and categories for cross-marketing
   - Types:
     - Category-to-category
     - Category-to-product

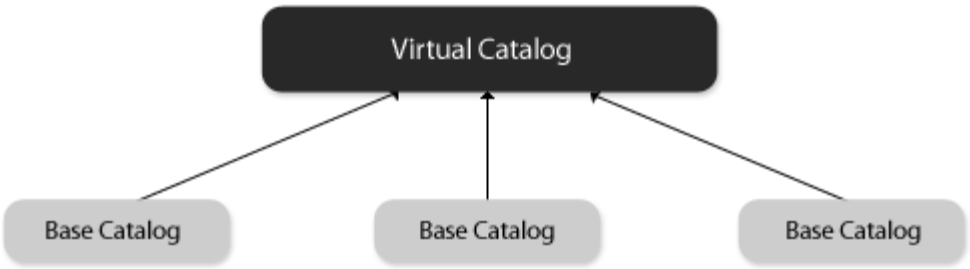
3. **Add products and product variants**
    - Choose the product definition, properties, and variants
    - Assign a product to one or more categories
    - Define cross-marketing relationships

Virtual Catalog

A virtual catalog references products from one or more base catalogs. A virtual catalog does not contain a database, as all products reside in the base catalog(s). Commerce Server 2002 supports up to 10,000 virtual catalogs.

Virtual catalogs:

- Show multiple base catalog information as one catalog
- Supports pricing in multiple currencies
- Applies pricing rules to sub-categories of customers



Shopping Carts

Shopping carts are temporary storage for order items and the interface for completing the order. Carts help users keep track of planned purchases and follows customers around the site. Carts are also called baskets.

Shopping Cart Features

- Ease of deployment
    - Deploying the cart should require minimum effort and time.
- Ease of use
    - The shopping cart must be intuitive to the customer. If the customer becomes confused or lost, the sale also is lost.
- Provide additional integration tools
    - A payment interface that supports multiple payment types should be included.
- Complex reporting features
    - Analyzing purchases, wish lists, abandoned cart items, etc. will improve the customer's shopping experience and the company's bottom line.

- Administrative interface
    - The ability to administrate the cart in an intuitive interface will minimize the time required to maintain the shopping cart.
    - Allows manual payment processing.
- Compatible server operating system
    - Open Source shopping carts work best on a LAMP system. Ensuring compatibility will reduce downtime and avoid deployment issues.

Order Handling

An order is created after the purchase is made. Order types include completed orders, incomplete orders and unfulfilled orders.

Completed Orders

- The order has been placed, processed and fulfilled.
- The items were shipped.
- Any remaining items were placed on back-order or deleted.
- Provide business intelligence.
    - Profile customers and their purchasing habits.
    - Design targeted marketing programs.
    - Identify suggested stocking levels.
    - Identify sales trends, such as seasonal or regional sales trends.

Incomplete Orders (considered an open order)

- Applies specifically to manual orders.
- Incomplete orders in the shopping cart.
- Orders that have been saved, but not purchased.
- These orders are either saved in memory, in a cookie, or on the server for later retrieval.

Unfulfilled Orders (considered an open order)

- Orders that are placed, but have not shipped.
- The orders are identified by order status values.
- The order can be reviewed by the customer.

1.3 Implement e-commerce-based learning solutions.

E-Learning Models

In addition to selling products, soft-goods can also be sold. Soft-goods include information and training. The following are instructional models for e-learning:

- Instructor-led training
  - Instructor interaction is synchronous and asynchronous.
  - Synchronous: users meet in a chat or virtual classroom.
  - Asynchronous: A prerecorded lecture that students view on their own.
  - Most content is presented through lecture.
- Self-paced instruction
  - Little or no interaction with the instructor or other students.
  - Provides a wide variety of learning objects: simulation, video demonstration, assessments.
  - May contain dynamic navigation and prescriptive learning.
- Web-based instruction
  - Combines all instructional models and is delivered on the Web.
  - Uses all types of learning objects, synchronous and asynchronous communication and, instructor-led presentations.

E-Learning Content

Delivering e-leaning can include a variety of methods and learning objects. These may include the following:

- HTML documents with text and graphics
- Games
- Assessments
- Video presentations
- Simulations
- Case studies

Sharable Content Object Reference Model (SCORM)

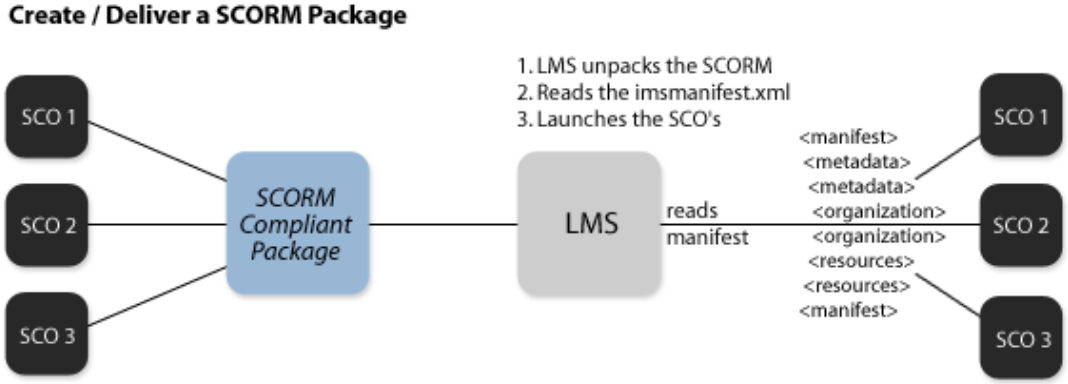
SCORM is a standard for creating reusable learning objects. These objects can be deployed in any environment that is SCORM compatible. This standard uses manifests that describe the learning object and allows it to run on a Learning Management System (LMS).

Terms:

Manifest	An XML root element document that describes a Sharable Content Object or curriculum. Called imsmanifest.xml.
Sharable Content Object (SCO)	A SCORM learning object. Also called a resource. Any learning object component is a SCO.
Learning Management System (LMS)	A series of software applications that create online courses, track student progress and provide assessment exams and other learning objects. Executes SCOs and other learning objects (assets).
Content Management System (CMS)	Centralized repository for content. Does not have user control functionality.
Learning Content Management System (LCMS)	Combines the functions of a CMS and an LMS. Limited learner management features.
Application Programming Interface (API)	Application that interfaces with software modules to provide common services.

SCO Function

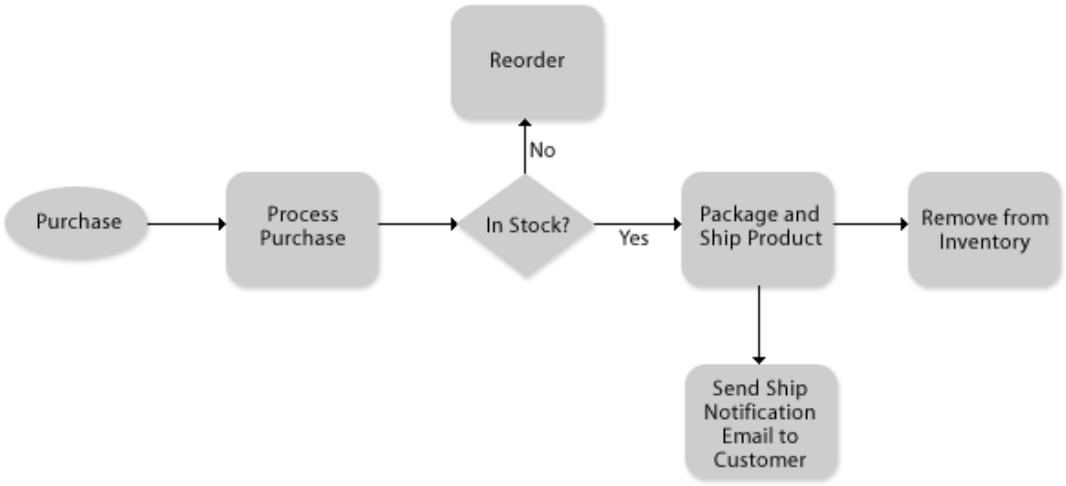
- The SCO searches for and launches an LMS API.
- The API tells the LMS that the SCO is launching.
- The API tells the LMS when the SCO launch is complete.



1.4 Implement inventory and fulfillment strategies for an e-commerce site.

Inventory Management

Inventory management addresses the process of inventory control from purchase to shipment. This type of management requires several components to manage the flow of products and the processes for handling the flow.



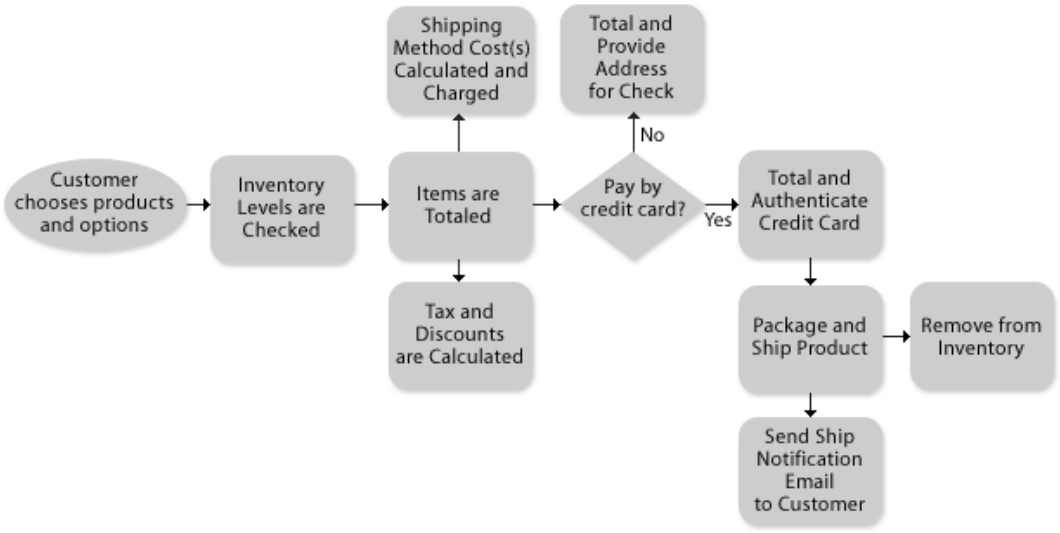
Inventory Components

- **Inventory Tracking**
  - Tracking inventory is tied to the information that resides in the inventory database or database tables. An inventory-tracking system integrates with other inventory components.
- **Online catalog**
  - Organizes and presents the inventory date to customers in an easily accessible manner.
  - Enables customers to find and select products.
- **Purchasing system**
  - Function
    - Determines which items to order and the quantity for each product.
    - Determines from which vendor to order the items.
    - Create and submit purchase orders.
    - Update on-order quantities.
    - Receives orders and updates inventory.
    - Generates payment for the order.

- **Customer order system**
  - Processes customer orders through a shopping cart or through automated EDI process.
- **Accounting Server**
  - Manual or automated system for ensuring transaction accuracy.

Designing Order Systems

The customer order process will define the manner in which an order system is designed. The figure below illustrates the customer order process:



Minimal Order System Requirements

- Inventory information.
- Online catalog information.
- Registered user (customer) information.
- Location information.
- Tax rates.
- Discount rates.
- Shipping rates.

1.5 Implement payment processing services for an e-commerce site.

Payment Processing Methods

Cash on delivery (c.o.d.) - This method delivers the product through a standard delivery service. The delivery service delivers the package and receives a money order or cashier's check payment for the order from the customer. The delivery service then delivers the payment to the seller. The delivery service also charges for the service.

Purchase orders - A customer is billed later for the product and service, after providing a purchase order number. The seller must send a bill and track the payment using this method.

Advanced payment using check or money order - Receiving a check or money order before the product or service is delivered requires more time than other payment methods. When the payment is received, the order must be matched to it.

Credit card with offline processing - This method is used when a brick-and-mortar or mail order business is already established, and credit cards are accepted in person. This method also acts as a transition from traditional to online.

Credit card with online processing - The advantages of this method are the improved efficiency in order fulfillment and immediate customer notification. The disadvantages are the monthly service fee, per-transaction charge and the lease of a payment gateway.

Online checks or bank account debit - This method involves an automatic debit from the customer's checking or saving account. This method is popular for recurring subscription purchases.

Online payment services - These services include BidPay and Paypal. BidPay is a payment service for the winner of an eBay auction item. PayPal is a payment service that allows businesses to accept payments from any purchaser with a credit card. The seller is charged a per-transaction fee and percentage charge. When the purchase is made through PayPal, the buyer selects the items on the seller's web site and then is redirected to PayPal for the sale completion.

Credit Card Processing

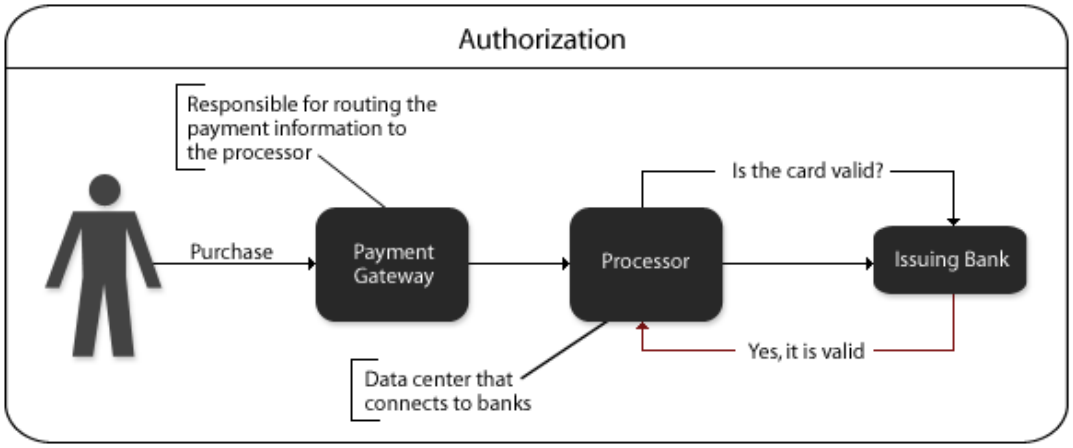
Setting up a business to accept credit card transactions online requires the following tasks:

- **Setup an online merchant account.**
  - A merchant account is required in order to process credit card purchases.
  - Considerations
    - Which credit cards are supported
    - Cost per-transaction fees
- **Install or connect to a payment gateway.**
  - The payment gateway is a separate service that acts as an intermediary between the merchants' shopping cart and all the financial networks
    - Includes the customers' credit card issuer and your merchant account.

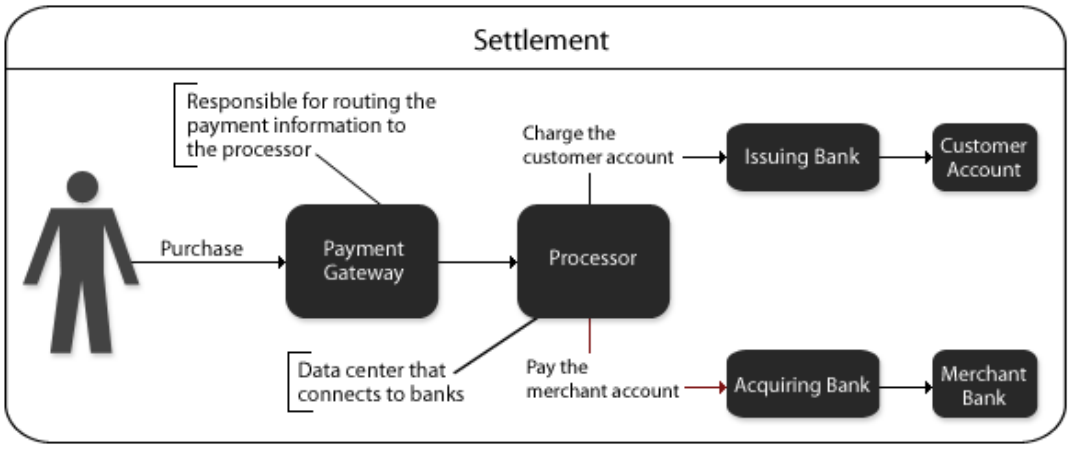
  - Functions:
    - It checks for validity
    - Scrambles transaction details
    - Insures the details go to the correct destination
    - Unscrambles the responses, which are sent back to the shopping cart
    - Puts the funds into the bank account
  - Considerations
    - Compatibility with shopping cart software
    - Support international currency conversion
    - Install location
    - Software price
    - Security features
    - Customer support
- **Setup the web server and configure the site pages.**
  - Configure the pages to link to the payment gateway
  - Integrate pages with database

Payment Process

- **Authorization Process**
  - Validates that the funds are available only. Does not release the funds.



- **Settlement Process**
  - The payment gateway starts the settlement process by contacting the processor. The processor contacts the issuing and acquiring banks.



Payment Processing Through PayPal

PayPal offers three types of accounts:

- **Personal**
  - Free account
  - Does not accept credit cards or electronic checks
- **Premier**
  - Variable per transaction fee and percentage fee
  - Accepts credit cards, e-checks and PayPal account transfers using your personal name
- **Business**
  - Variable per transaction fee and percentage fee
  - Accepts credit cards, e-checks, and PayPal account transfers using the business name

Setting up a PayPal Account

- Provide your name, address, business name, email address, and phone number.
- Provide bank account information (PayPal will verify the account by depositing funds into the account).
- Verify the account once the funds are deposited.
- Choose a strong password.
- Customize the payment and confirmation pages.

Online Check Processing

- **Two Models**
  - Hard-Copy deposit
    - Enter checking information into a form
    - The online check-processing service prints a hard copy
  - Electronic Processing
    - Collects the same information but retains it in electronic form
    - Use EFT (Electronic Funds Transfer)
    - No hard copy
    - Disadvantage: payment may not be received immediately

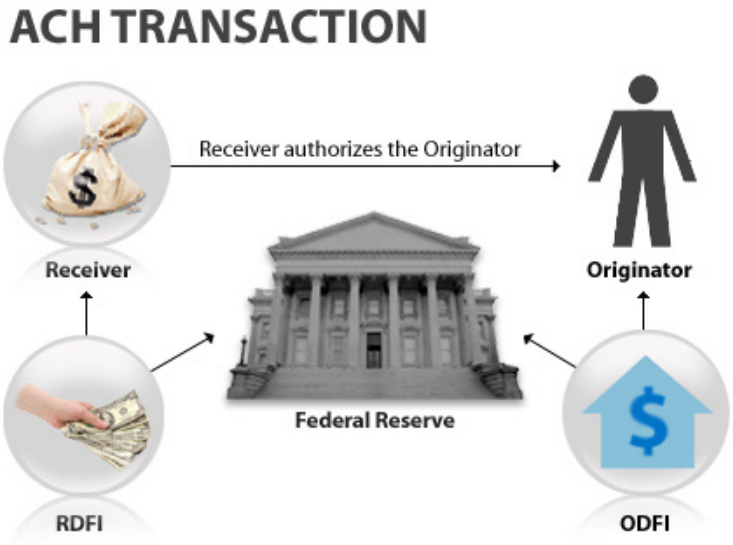
Electronic Processing

Electronic processing requires the use of the Automated Clearing House network. This network transfers and clears funds between banking institutions for sellers and buyers.

- Automated Clearing House (ACH)
  - Batch oriented EFT system
  - Clears electronic payments
    - Uses National Automated Clearing House Association operating rules
  - Acts as mediator between financial institutions
  - Involved in every type of financial transaction EXCEPT wire transfers
  - Not real-time processing; usually needs 24 hours

Terms:

Originator	An individual, corporation or other organization that initiates and forwards transaction data to the ODFI.
Originating Depository Financial Institution (ODFI)	A financial institution that originates ACH entries. The ODFI transmits files to the ACH operator.
Receiving Depository Financial Institution (RDFI)	A financial institution that receives ACH entries, makes funds available and reports on statements.
Receiver	An individual, corporation or other organization that authorizes an Originator to initiate a credit or debit entry to a transaction account at an RDFI. The receiver authorizes the originator.



Prevent Fraud

- **Cost of Fraud**
  - Loss of revenue from fraudulent purchases.
  - Charge-back fees.
  - Lawsuits for identity theft losses.
  - Loss of goodwill due to the publicity of a break-in.
  - Loss of revenue from sales with suspect payment information that is actually legitimate.
  - Increased fines assessed by financial institutions for high fraudulent transactions.
  - Higher cost for merchant account transactions.
- **Types of Fraud**
  - **Product Theft**
    - One-time incident that occurs from a purchase with a fraudulent credit card.
    - Prevention: authenticate the customer through address verification and credit card security codes (CSC).
  - **Identity Theft**
    - Customer identity: social security or credit card information is stolen
    - Merchant identity: access to merchant account information occurs
    - Prevention: Secure customer data at all data transfer points and use encryption protocols.
  - **Cash Theft**
    - Impersonation and transfer of funds from bank accounts.
    - Prevention: use strong passwords, change password frequently and do not share passwords.

Domain 2.0 – E-Commerce Technology and Security - 46%

2.1 Define and use standards, initiatives and e-commerce frameworks that support supplier transactions.

E-Commerce Models

E-Commerce models include business-to-consumer and business-to-business. These models continue to change and grow as technology changes.

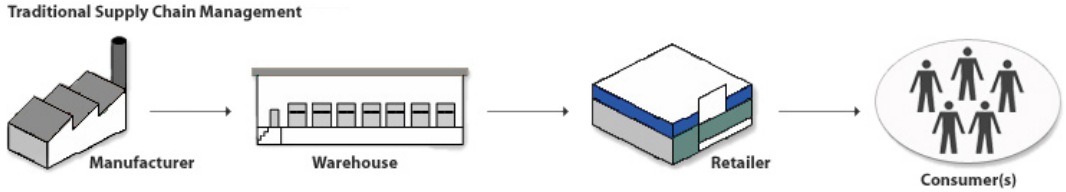
- **Business to consumer (B2C)**
  - Targets consumers or end users, and sells products and/or services
  - Market Models
    - Portals
    - E-retailers
    - Service Providers
    - Content Providers
- **Business to business (B2B)**
  - Helps organizations to manage relationships and transactions with other businesses
  - Market Models
    - E-distributors
    - E-procurement
    - Exchanges
    - Industry consortia

Business Concepts

- Supply Chain
- Procurement
- Inventory and order control
- Shipping

Supply Chain Management

This is the management of the process that generates a product and distributes it to customers. The process begins with raw materials and ends with a product delivered to a consumer.



Supply Chain Management

- Requires effective management to insure no loss of production time due to ineffective supply management
- Many industries use JIT delivery
  - Management system that controls inventory so that materials arrive only when needed
- Achieve successful supply chain fulfillment
  - Investigate suppliers and systems
  - Use process activity automation
  - Create an industry consortium

Procurement

Procurement is the process that companies use to buy items from suppliers. Procurement is usually an automated process.

- **Procurement Models**
  - Horizontal
    - Procurement in a horizontal market means that the product is procured from manufacturers from different industries.
  - Vertical
    - Procurement in a vertical market means that the product is procured from a coordinated and streamlined distribution channel within the same industry.

Inventory and Order Control

Inventory is the amount of products, or goods, on hand and available for sale and delivery to customers. Order Control is defined from the customer and supplier perspective. Order control information includes:

- Placing Orders
- Tracking Orders
  - Order ID
  - Order status
  - Items ordered
  - Customer information
  - Shipping information
  - Applicable dates
- Receiving Orders

Tools and Technologies

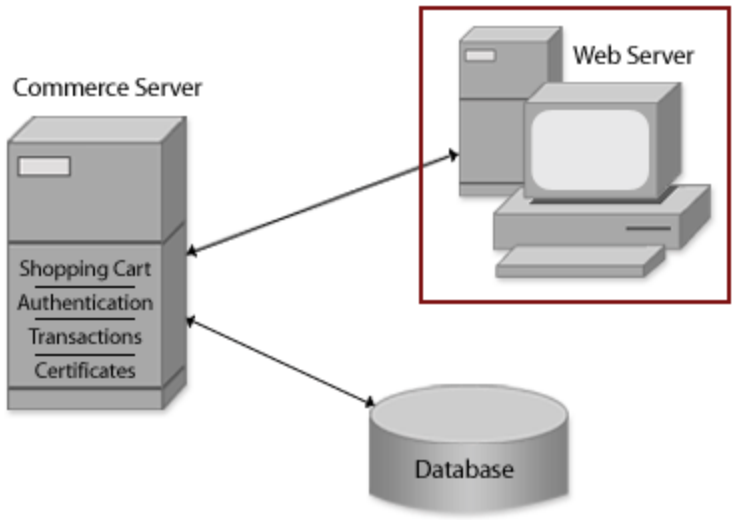
- **Electronic Data Interchange (EDI)**
  - Key technology for B2B e-commerce
  - Standardizes electronic commerce within an organization
  - Messaging protocol that ensures data is compatible with different computer systems
  - Supports inter and intra-organizational document exchanges
  - Secure Internet EDI exchanges by using S/MIME or VPN
  - Electronic replacement for the following:
    - Invoices
    - Bills
    - Purchase orders
    - Inventory lists
    - Supply chain information
  - Convert to EDI if the company:
    - Handles repetitive standard transactions
    - Operates with a tight margin
    - Needs productivity improvement
    - Operates in a time-sensitive environment
    - Receives requests from other companies to convert to EDI
  - XML and EDI
    - EDI is moved into the Internet through XML
    - XML describes the same data as EDI
    - Use of XML and EDI provides more flexibility
    - XML is human and machine readable, EDI is only machine readable

- **Open Buying on the Internet (OBI)**
  - Data exchange format based on open technologies
  - An alternative to EDI
  - Targets high-volume, low-cost transactions
  - OBI components
    - Requisitioner – person initiating the purchase
    - Buying Organization – company represents the requisitioner
    - Selling Organization – offering product for sale
    - Payment authority – acts as neutral 3rd party to settle the financial component
- **Open Trading Protocol (OTP)**
  - Alternative to SET
    - An open standard
    - Used for B2C and B2B
    - Orders are formatted in ANSI EDI X12 850
    - Uses digital certificates for verification and encryption
    - Often used with XML
  - Features:
    - Provides trading protocol options to control the way that the trade occurs
    - Provides a record of a particular trade
    - Supports real and virtual delivery of goods and services (payment tracking)
    - Supports IPSec or TLS for security

2.2 Configure Web server software for an e-commerce site.

Web Servers

- Web servers serve HTML or XHTML. There are a variety of web servers available for supporting electronic delivery of information.
- Web servers use the HTTP, HyperText Transfer Protocol, to ensure that requests can be received and replies transmitted between servers and clients.
- Servers not only control the flow of information, but their functionality can be extended by additional programs.
- Servers also deploy client-side and server-side scripting.



Web Server Software Comparison

The leading web server software packages are Microsoft IIS 6.0, Sun Java Systems 6.1, and Apache Web Server. The first two are proprietary software, and the last is open source. Each package has its advantages and disadvantages. Review each server's features carefully.

- **Microsoft IIS 6.0**
  - Proprietary $$$$
  - Operates on the Windows platform
  - Features
    - Application support.
    - CGI and ISAPI support.
    - Supports certificates and SSL services, up to 128 bits.
    - Allows certificate generation and management.
    - Integrated FTP, NNTP, SMTP.
    - Integrates with other Microsoft programs.
    - Provides process isolation, health monitoring, and application recycling.
  - Advantages
    - Familiar interface.
    - Built–in support from Microsoft applications.
    - Supports virtual directories.
  - Disadvantages
    - Software is expensive
    - Support is fee-based
    - Learning curve is considerable

- Sun Java Systems 6.1
  - Proprietary $$$$
  - Operates on the Sun Solaris, Linux, Hewlett-Packard, IBM, and Windows platforms
  - Features:
    - Supports ASP, JSP, Java servlets, Coldfusion, PHP, CGI.
    - Support for SSL v2, SSL v3, Transport Layer Support (TLS) 1.0 and X.509 digital certificates.
    - Uses JavaScript to connect to databases.
    - Can implement other server-side scripting applications.
    - Core multi-process, multi-threaded engine provides reliability.
  - Fee-based support
- **Open-Source Free**
  - Operates on Linux, Unix, Windows, Novell platform
  - Supports SSL and TLS
  - Advantages
    - Source code and executable is available and can be modified
    - Free
  - Disadvantages
    - Does not support additional Internet services (news or email server).
    - No formal support system

Choosing Server Hardware

Running web server software requires reliable, scalable, and sufficient hardware. The following should be considered when setting up web server hardware:

- **Processor and Memory Considerations**
  - Hardware requirements for the operating system.
  - Hardware requirements for the Web server software.
  - Hardware requirements for any other services and software.
  - The number of simultaneous connections you must support.
- **Disk Space Considerations**
  - The size of the HTML pages and graphics.
  - The disk space required for the operating system, Web server software and any other software.
  - The disk space required for the product catalog.
  - The disk space required for the order and customer database (if stored on the Web server).
- **Scalability**
  - Issues relating to usability and localization
  - Scalability implemented through operating systems and server applications

- Scaling up
  - Improving performance by installing additional processors or memory
  - Multiple processors: web garden
- Scaling out
  - Creating a collection of servers: web farm

Deploying Microsoft IIS 6.0

IIS 6.0 comes with all versions of Windows Server 2003. In order to use it, it must be manually installed. The following steps will ensure that IIS 6.0 is secure and scalable.

Step 1: Preparation

- Ensure that the server can handle the traffic.
  - Evaluate the amount of bandwidth available.
  - Determine the number of requests the server must handle in peak periods.
  - Decide whether the server must handle other processing (database, DNS, etc.).
  - Know how the server will be managed and maintained.
- Ensure that the server is secure.
  - All drives are formatted with NTFS
  - Unnecessary services are disabled
  - Close unused ports
  - Rename the Administrator account
  - Use strong passwords
- Identify services and extensions
  - Default settings: Common Files, IIS Manager, SMTP, World Wide Web Service
  - Optional: ASP.NET, Active Server Pages, FrontPage Server Extensions, SSI
- Choose Domain Name
  - Choose and register domain name
  - Ensure that all host names are resolved

Step 2: Installation

- Add the Application Server role through Add/Remove Programs
  - Default server is file server
- Select additional components through the Add/Remove Programs window
  - Choose the details for each component
- Enable Active Server Pages, Internet Data Connector, WebDAV and SSI extensions in the Web Service Extension window

Step 3: Configuration

- User accounts
  - Internet Guest Account default is IUSR_computername.
    - Do not disable or delete this account, or change the password
  - IWAM_computername is used to start applications.
    - Do not disable or delete this account, or change the password

- Virtual servers
  - Allows multiple Web sites on one server
  - Requirements
    - Unique IP address, TCP port or host header value
    - Port and IP address
  - Using host headers
    - Must register each with a DNS server
    - Host header mapped to single IP: each requires an alias (CNAME)

Host header example:

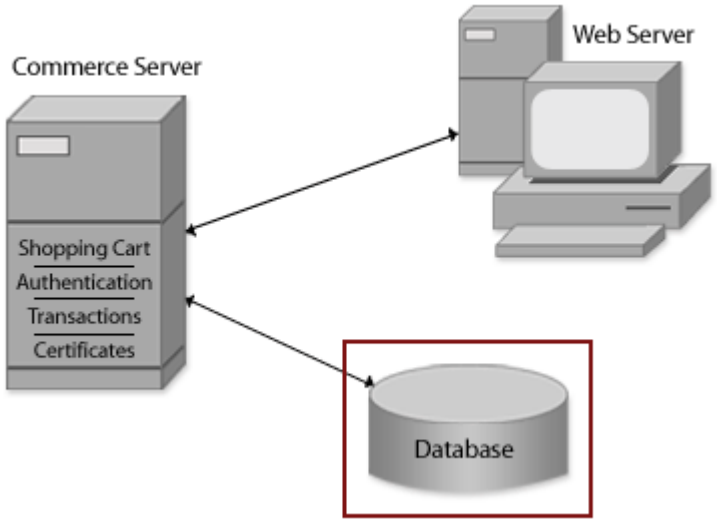
Record	Host name	Host Header
A	Server1	None
CNAME (alias)	Subdomain1	demo.chromezebra.com
CNAME (alias)	Subdomain2	catalog.chromezebra.com

- Virtual directories
  - Contains folders and files.
  - Local file names are mapped to URL's (which are virtual directories).
  - Use UNC format to specify the path.

- Default documents
  - When a web server receives a request for a directory (without a file name), it will return a default document within the directory, generate an error message and refuse the request or return the directory contents.
  - Names
    - Index.htm, index.html, default.htm, default.html, home.htm, home.html or any other configured default name.

Database Servers

The information highway has warehouses of information stored along the way. These warehouses are databases that reside on servers. The databases store huge collections of information to be retrieved and examined. Databases control this information in the background.



There are two general categories of databases: the flat database and the relational database.

- **Flat-file databases**
  - File systems that interact with data in various files
  - Reports are typically generated from these types of databases
  - Used for data transfer, export, and import - not database applications
  - Information in a flat database:
    - Usually text separated by commas
    - Files have the extension .csv

    - Problems
        - May contain duplicate information
        - Wasted space
        - Restricted performance
            - Example: the sales department has a database that contains the inventory; the purchasing department has a database that also contains the inventory. This redundancy of data is not an efficient system.

- **Relational Database Management Systems (RDBMS)**
    - Single repository of logically related data
        - replaces the files that once held the data in many different places
    - Data redundancy is eliminated or reduced
    - Data is contained in a set of formally defined tables
    - Data can be accessed or reassembled from the database in many different ways
    - Database tables do not have to be reorganized
    - The tables contain data that relate to data held in other tables within the same database

Data Design Requirements

- Data Storage
    - Determine what data is to be stored
    - Decide the table structure
    - Define the relationships between tables
- Data Access
    - Determine data access and connections
    - Security issues
        - Access and connectivity
        - Connection methods and APIs
        - Query design issues
    - Decide on the data to analyze
- Performance and Reliability
    - Consider the data being stored, the data access volume
    - Plan for the number of data transactions and concurrent use connections
- Network Communication
    - Ensure that components can communicate with the database server
    - Ensure that sufficient bandwidth is available for data transfers

Structured Query Language

The language most commonly used to create relational databases is Structured Query Language, or SQL. Most databases have proprietary languages to use internally, and SQL is the common language among them.

- Creates tables and other database components
- Defines the relationships between the tables and components
- Accesses, inserts and modifies table data
- Creates executables to support third-party applications.

SQL is composed of subset languages as well. One subset, DDL, or data definition language, allows the database designer to specify data types and data constraints. Another subset is DML, or data manipulation language. This subset allows users to retrieve, insert, update and delete data in the database.

Microsoft SQL Server 2000

SQL Server 2000 is the Microsoft relational database application for storing, retrieving and warehousing data.

Features:

- Ease of installation and use
- Self-tuning performance parameters
- Scalability to support multiple processors across multiple servers
- Replication support for distributed data applications
- Integration with e-mail, XML data support and other Internet technologies
- Scalable depending on version
    - Standard Edition
        - 4 processors and 4GB RAM – does not support clustering
    - Enterprise Edition
        - 64 processors and 64GB RAM – supports two-node fail-over clustering

2.3 Analyze and improve e-commerce site performance.

Logging and Trend Analysis

Evaluating system and service logs provides information on the system's function and ability to meet the demands placed on the server.

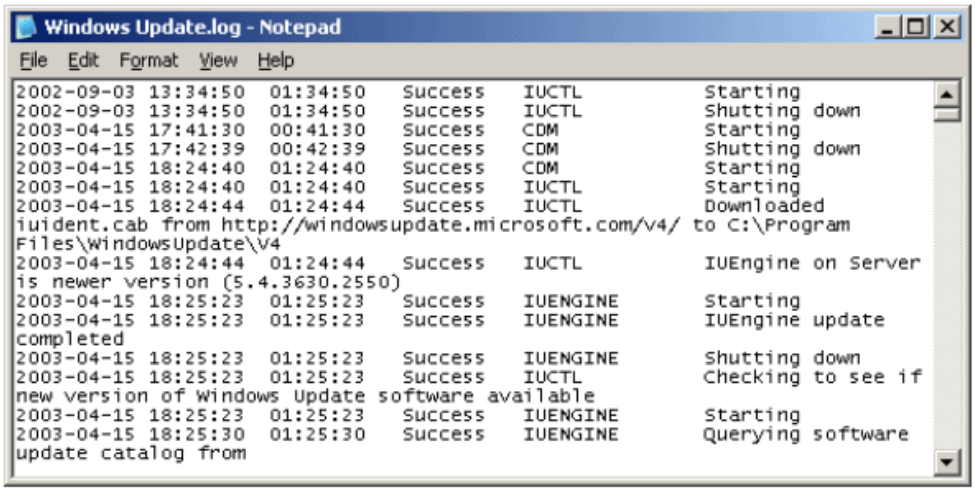
Types of information contained in logs:

- Server efficiency – monitors failed services or service problems
- Usage rate – amount of work the server handles
- Security – failed logon attempts, etc.

- Evaluating Logs
  - Error messages – evidence of overburdened server, hardware or software failures, an unstable OS or security violations.
  - Security violations – indicating a break in or users in need of training, or password rules in need of revision.
  - Usage rates – how to adjust system performance based on typical and peak use, hardware resources and load balancing. May also indicate a need for a more powerful server.

HTTP Server Log

- Analyzes HTTP requests and responses
- Can be analyzed offline
- Records time and size of transaction
- Produced in NCSA form (National Center for Supercomputing Applications)
- Types of Server Logs
  - Access – logs info on URL fetches
    - IP addresses, time, name of URL, HTTP request
  - Error
    - Startup and shutdown, malformed URL's, erroneous CGI scripts
  - Referrer
    - Shows the number of files one page must render (# of links) in a browser
  - Agent
    - Records the version of a user agent that accesses the site
    - User agent – client software used to browse the web



Monitoring SQL Server

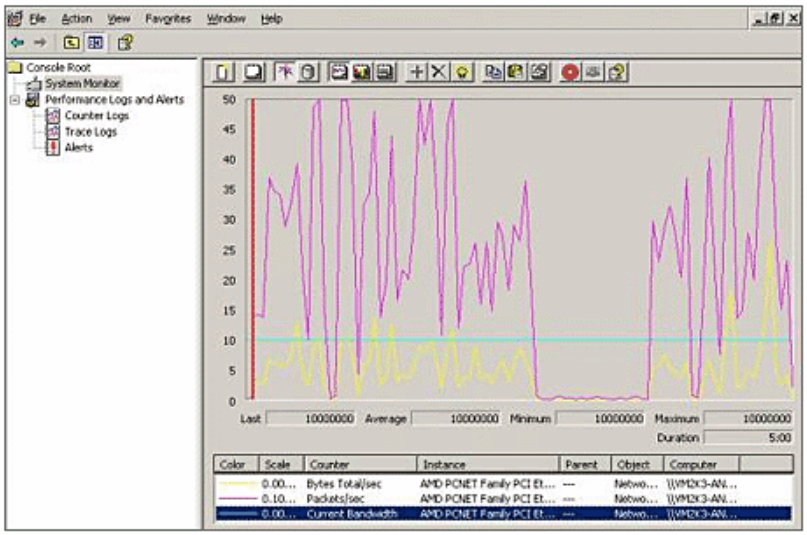
Database monitoring is critical to the operation of a commercial site. Ongoing monitoring supports the system's ability to maintain inventory and query requests.

- Tools
  - Performance Counters
    - Allows the user to choose the number of performance objects to be analyzed
  - SQL Query Analyzer
    - Analyzes what was executed in the query and tests queries
  - SQL Profiler
    - Captures database server activity
  - Index Tuning Wizard
    - Provides suggestions for improving data query performance

Analyze Server Performance

The initial step to evaluating the performance of the web server is to create a baseline of network activity. Testing should occur after the baseline measurement is complete and under load. The following tools will evaluate server performance:

- **Packet sniffers**
  - Capture packets as they cross the network
  - Places host NIC into promiscuous mode
  - Produces large amounts of data (may increase load on server)
- **Windows Server 2003 System Monitor**
  - Excellent tool for evaluating server performance
  - Provides real-time performance information
  - Provides filtering of data
  - Monitors Server Work Queues, Active Server Pages, Processor, TCP, Server, Logical Disk, Web Service and FTP Service
  - Logs information based on selected performance counter
  - Problem: software overhead impacts the data
  - Solution: Run the System Monitor software on a separate computer
  - Other tools:
    - TCP/IP utilities: netstat determines the number of connections in a system



2.4 Secure e-commerce transactions.

Managing Transactions

Transactions are a set of actions that interact with each other. E-Commerce actions of a successful transaction require that the items are in stock, the payment is approved and settled, the item quantities are deducted from the inventory and the order is shipped.

Note: if any of these actions do not occur, then the transaction is not successful.

Refund transaction

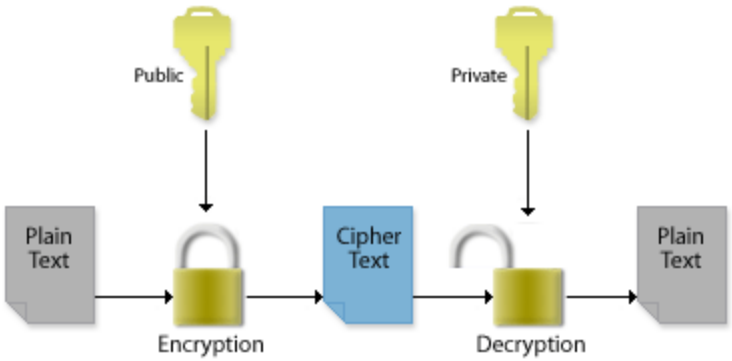
Manual transaction that results when an item is out of stock, or the order is cancelled or the item is returned.

Security Terms

Term	Definition
Identification and Authentication	Process of identifying and verifying a person.
Access Control	Governs the resources a user can access and protects against the unauthorized use of the resources.
Data Confidentiality	Provides encryption/decryption for data and prevents unauthorized reading of data.
Data Integrity	Ensures that the data has not been modified en route to the destination.
Non-Repudiation	Ensures that the merchant cannot claim that a product wasn't purchased (receipts).
Cryptography	Message that is in plain text.
Encryption	Disguises a message to make it unreadable.
Decryption	Restores an encrypted message back to its original form.

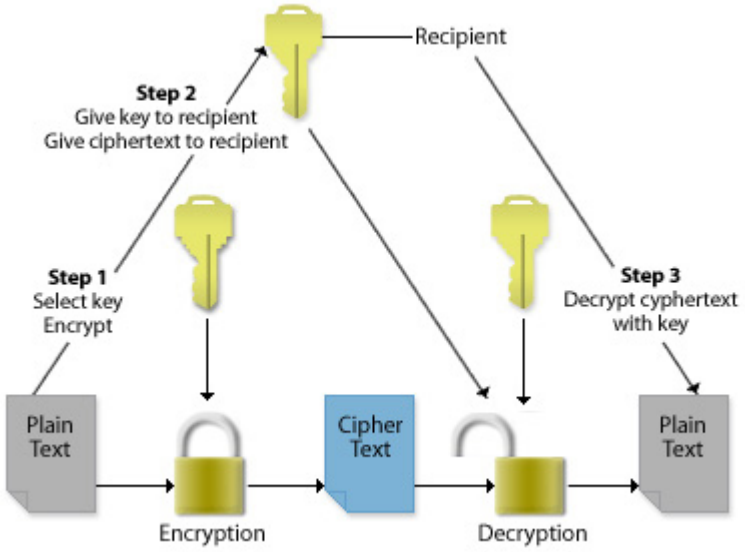
Encryption

- Disguising a message to make it unreadable
  - Encryption Strength
  - Based on 3 factors
    - Strength of the algorithm (calculation)
    - Secrecy of the key
    - Length of the key
  - Symmetric
  - Asymmetric (public-key)
  - One-way (hash function)

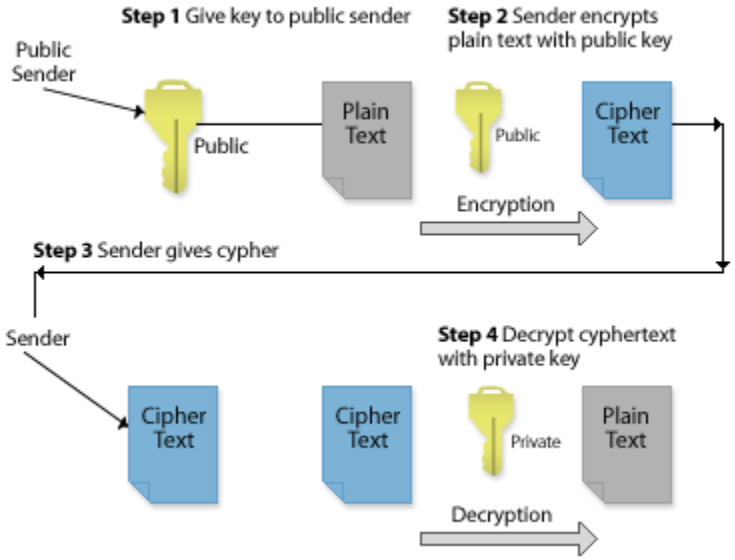


Encryption Types

- **Symmetric Encryption (secret-key):**
  - Both parties must possess a single secret key (password)
  - To use symmetric encryption, a secure channel must be established
  - Algorithms that use symmetric keys:
    - Advanced Encryption Standard (AES): 128-bit block size, key-lengths: 128-bit, 192-bit and 256-bit.
    - Data Encryption Standard (DES): Block cipher, 56-bit key, most commonly used for symmetric encryption.
    - Triple DES (3DES): More secure than DES, Uses three 56-bit keys. Support included in Windows 2000 with the High Security Pack, Windows XP and Windows Server 2003.
    - Skipjack: 80-bit key and a 64-bit 32-round block cipher.
    - International Data Encryption Algorithm (IDEA): Block cipher, 128-bit key to operate on 64-bit plaintext blocks in eight iterations, used in Pretty Good Privacy (PGP) 2.0.
  - Disadvantages:
    - Issues with communicating the shared secret key
    - Subject to off-line attacks
    - No auditing



- **Asymmetric (or Public):**
  - Reliable user-specific encryption
  - Allows unacquainted parties to conduct a transaction
  - Strong authentication
    - Each party receives two keys (one public, one private)
    - Secret (private) keys are never shared
    - Public keys are publicly accessed
    - Use of hash in one-way encryption
  - No secure channel required
  - Standard:
    - RSA – proprietary algorithm - 512bits to 2048bits

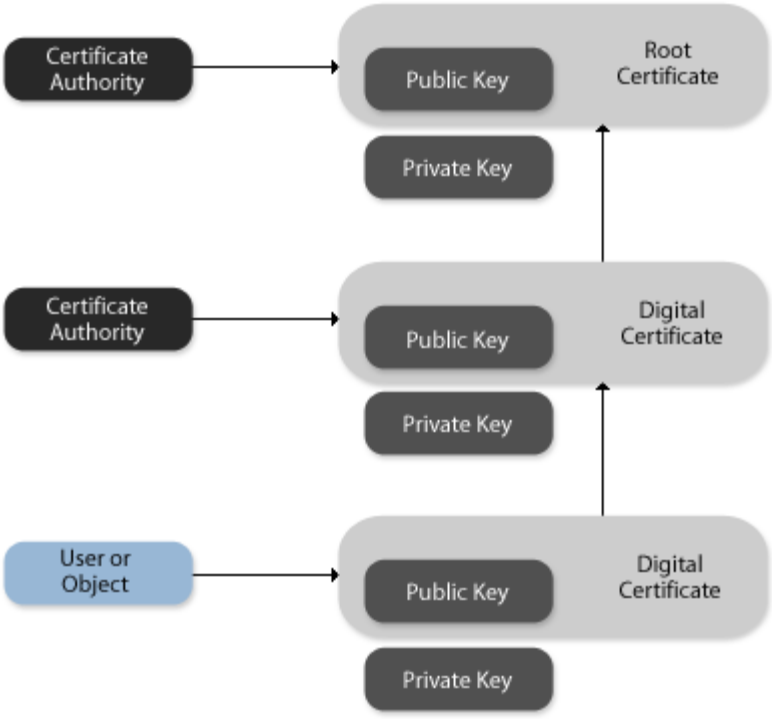


- **One-Way Encryption**
  - Use of Message digests
    - Specific application of a one-way function
    - Senders are concerned with messages altered in transit
  - Uses hash algorithm (digest)
    - Algorithm (calculation) that encrypts text messages
    - MD5 – well know hash function
    - SHA – more complex hash function
    - Unique to the message from which it was created
  - Disadvantages:
    - Encryption is slow
      - Symmetric encryption is 100 times faster

Digital Certificates

- Standard file format for storing a public key
- E-Commerce security component
- Standardizes the way of storing and exchanging public keys
- Contains fields that hold the user's id, public key, the period of validity, the name and signature of the issuing certificate authority (CA)

- **Public Key Infrastructure (PKI)**
  - Software services and technologies used to issue and manage digital certificates
  - Includes one or more certificate authorities (CA)
- **Certificate Authorities (CA)**
  - Trusted third parties (like notaries public) that issue digital certificates
  - Verifies the identity of the person or company before endorsing a certificate
  - Signs the contents of a certificate file with a private key



ITU X.509 Standard v4

This standard is used by all four certificate types. It establishes the format ant contents of the physical certificate file.

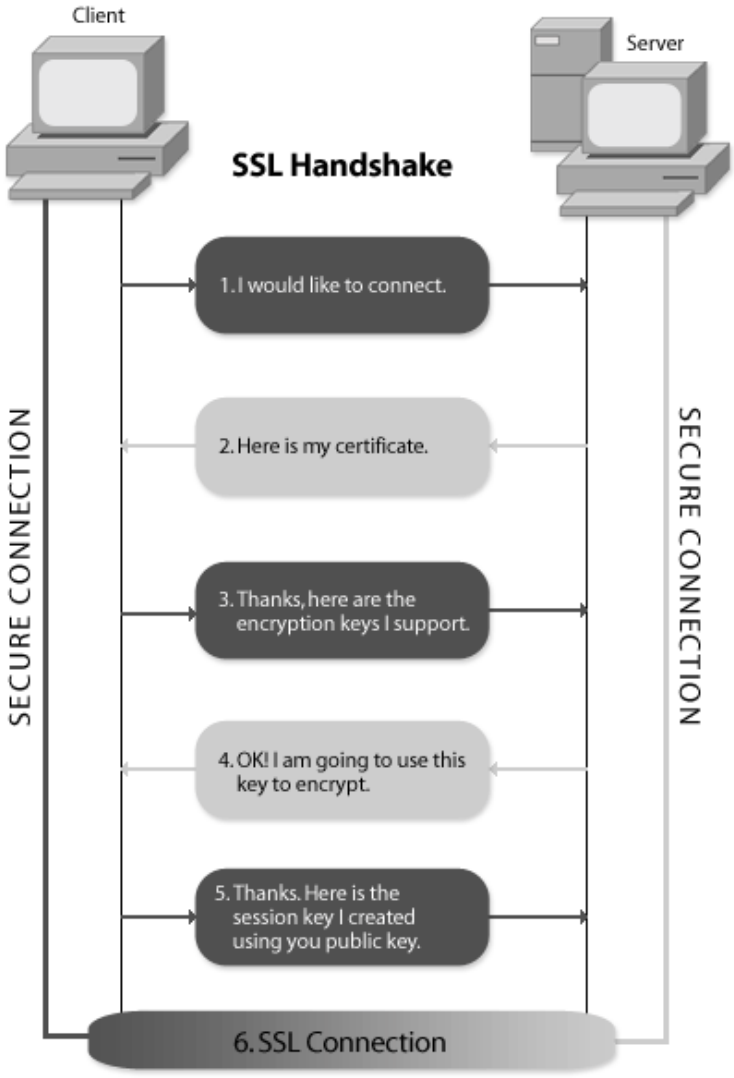
- Version
  - The version number of the certificate: 1, 2 or 3.
- Serial Number
  - Contains a unique serial number for the certificate file.
- Signature Algorithm ID
  - Indicates the message digest algorithm used to sign the certificate file.
- Issuer Name
  - The company name of the certificate issuer.
- Validity Period
  - The validity beginning and ending dates for the certificate file.
- Subject (User) Name
  - Contains the holder's ID.
- Subject Public-Key Information
  - Contains the holder's 1,024-bit public key.
- Issuer-Unique Identifier (v2 and v3)
  - Contains the unique number identifying the issuer.
- Subject-Unique Identifier (v2 and v3)
  - Similar to the issuer unique issuer identifier for every certificate holder.
- Extensions (v3)
  - Contains generating authority extra information (non-standard field).
- Signature (fingerprint)
  - A cryptographic signature of the contents of all previous fields.

Revocation Issues

- Private-key compromise
- Wrong certificate issuance
- Issuance is no longer valid
- Compromised CA

Secure Sockets Layer (SSL)

Secure Sockets Layer is a secure protocol that allows Web-based applications to pass data securely through an encrypted channel. The following figure outlines the connection process between a client and a Web server. Note: it is the client that authenticates the server.



Obtaining an SSL Certificate

Certificates are issued by a third party. The largest issuer of certificates is VeriSign. A certificate gives an e-commerce business credibility.

- Steps to Obtain a Certificate
  - Create a new certificate request
  - Prepare the request as a text file or send the request to an online CA (do not use abbreviations)
    - Provide a name for the certificate
    - Select the bit length for the key (default: 1,024 bits)
    - Select a Cryptographic Server Provider
    - Provide the name of your company and department using the certificate
    - Provide the DNS name registered for the website
    - Provide the location of the company
    - Save the text file request
  - The algorithm is created to create a public and private key
  - Send the request to VeriSign or other CA

Note: The Apache Web server allows a self-signed SSL certificate for testing.

Installing an SSL Certificate

Once the certificate request is processed, it must be installed on the Web server that made the request. Two keys are created from the request. The first, a public key, is the request file. The second, a private key, is stored in a secure location on the Web server.

1. **Set the root certificate path:**

   a. After receiving the certificate from the CA
   b. Open Tools, Options in Internet Explorer
   c. Click Certificates and then Trusted Root Certification Authorities
   d. Import the certificate into the Certificate store
   e. Close the window

2. **Install on IIS 6.0**

   a. Open the email file containing the certificate response
   b. Create a text file and paste the response into the window
   c. Save the file
   d. Open the Default Windows Properties window
      i. Click on the Directory Security tab
      ii. Click on the Server Certificate button
      iii. Select Process the Pending Request and Install the Certificate button
   e. Navigate to the text file and open it
   f. Click port 433

3. **Install on Apache Web server**

    a. Copy the private and public key to the same directory
    b. Add two SSL directives to the httpd.conf file for each virtual host using SSL
    c. Set the SSLCertificateKeyFile path and file name
    d. Stop and restart the Apache server

4. **Other Steps:**

    a. Enable HTTPS
    b. Set the SSL channel
        i. Choose the 128 bit option
        ii. Choose the virtual directories that inherit the Web site settings
    c. Configure virtual directories
        i. Use the Directory Security Edit button to configure
        ii. Require 128-bit encryption
    d. Accessing SSL protected resources
        i. Use the HTTPS in the web address to access

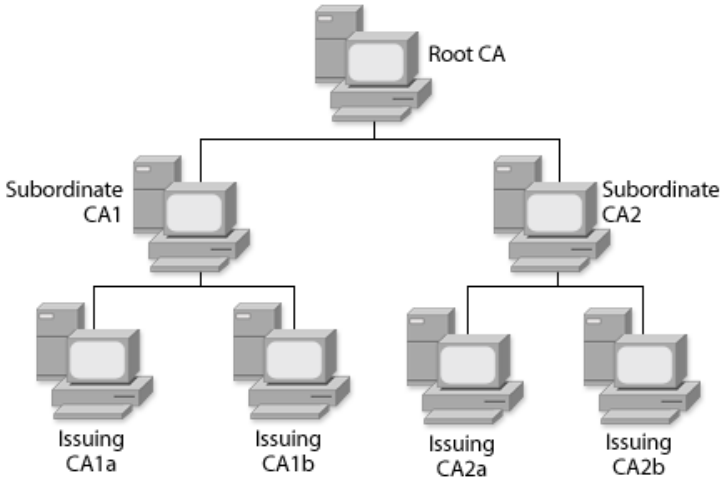
    Note: a certificate trust list cannot be identified to a virtual directory.

    Note: applying SSL to directories that are not involved in secure communications will degrade performance.

Implement Microsoft Certificate Services

This implementation will allow the Web server to act as a Certificate Authority (CA).

- **Design the CA hierarchy**
    - *Root* CA
        - Uses a self-signed certificate
        - Is always the first CA
    - *Stand-alone root* CA
    - *Subordinate* CA
        - Issues the user and computer certificates
        - May control issuing CAs
    - *Enterprise* CA
        - Windows Server 2003 uses Active Directory to validate certificate requests
        - Used for issuing certificates within the company
        - Does not usually contain a root CA
    - *Stand-alone* CA
        - Does not use Active Directory to validate a certificate request
        - Uses manual procedures

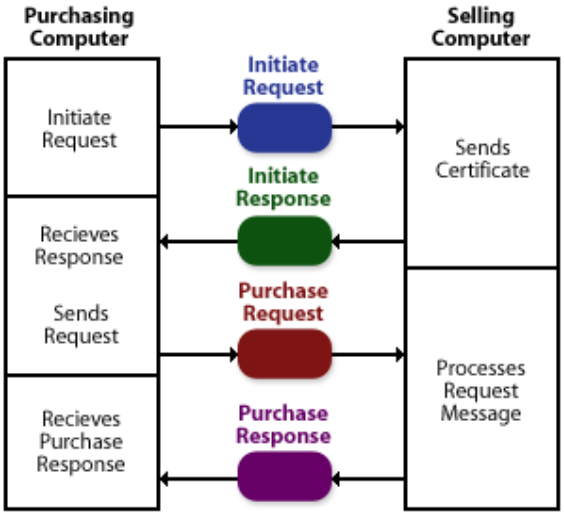


2.5 Secure an e-commerce site.

Secure Electronic Transactions (SET) protocol

The SET protocol secures online credit card payments. All three parties must use the SET protocol. SET uses public (asymmetric) and private (symmetric) keys.

- Uses digital certificates to secure financial transactions
- Public and private keys ensure encryption, data confidentiality and non-repudiation
- Designed to allow both simple and complex transactions



Types of Security Attacks

- **Denial-of-service attacks**
  - The attacker consumes that system's resources compromising the server or services.
  - Common attacks:
    - Ping of death: attack that sends a large ping packet.
    - Teardrop: attack that sends packet fragments with the wrong fragment offset values.
    - SYN flood: attack that uses an unreachable source address in an IP packet.
    - Smurf: attack that sends large number of spoofed Internet Control Message Protocol (ICMP) packets.
- **Database tampering**
  - Caused by weak passwords, granting too many permissions or unchecked dynamic query values.
- **Buffer overflow attacks**
  - Vulnerabilities are exploited in an unchecked software buffer. Forces the computer to process any code.
- **Social engineering**
  - Dumpster diving: discarded confidential information is collected in the trash.
  - Information gathering: pretending to be an IT department employee in order to gain a user's password.
  - Password guessing: password guessing based on knowledge of the user.
- **Phishing**
  - A pseudo website is created to simulate the real site. This type of attack targets the consumer. Encourage customers to ensure they are in and using a secure connection.
- **Pharming**
  - Changes the DNS entry of a website which sends users to the false site. Occurs through browser plug-ins and add-ons.

Protect the Server and the Customer

- Disable unnecessary services.
- Close unnecessary ports on the computer and in the firewall.
- Limit the ways users connect for updates.
- Limit administrative accounts.
- Physically secure the servers.
- Audit security and review logs regularly.
- Update the operating system and applications with security patches.
- Post a conspicuous privacy policy on your Web site.
- Do not allow advertisers to infect user's computers.
- Adhere to the CAN-SPAM Act when sending email.

Plan for an Attack

- **Advance notification**
  - Monitor the web server for patterns
  - Audit system events
  - Track login attempts
  - Track attempts to access system files or printers
  - Create log files targeted at specific services
- **Recovery plan components**
  - Devise a recovery plan in advance
  - Include in the plan:
    - List of recovery specialists and their responsibilities.
    - A list of public relations procedures.
    - Law enforcement notification procedures.
    - Other party notification procedures (ISP or ASP).
    - Procedures for preserving evidence.
    - Procedures for restoring service.
- **Recovery plan steps**
  - Determine the business' priorities.
    - Stay online to gather data or shut the system down to preserve evidence
  - Evaluate the attack methods and the extent of the attack.
  - Set up or update a replacement server.
    - Make sure current security patches are applied.
  - Bring the system back online.
  - Restore services.
  - Audit the restored service.

Evidence Collection and Preservation (bagging)

Preserving the evidence is critical if a prosecution occurs. The following steps will help the prosecution process.

- **Steps**
  - Remove the system from the network immediately.
  - Write the disk image to a CD-R.
    - Do not modify the data in any way.
  - Collect the data stored in RAM.
    - Do not shut the computer down until it is collected.
    - Use RAM imaging if available, otherwise manually record its state.
    - List all processes running.

- Remove the hard disks and put into a bag.
- Create a chain of custody for each component.

Analyze the Attack

Determine the extent of the attack. Evaluate whether passwords were compromised, data was stolen and/or malicious software was installed. Create a bit-level image of the system when performing the analysis. Identify the steps that will prevent the attack from reoccurring by removing services or applications, changing passwords or applying security updates.

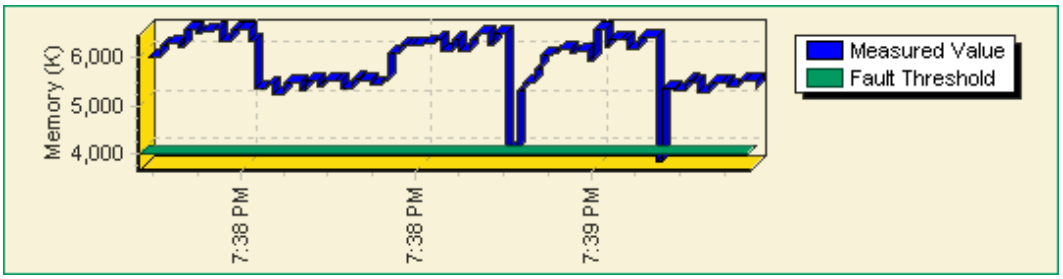
Preparing the Replacement Server

A replacement server may already be in place, but it will need to be updated with the most current security patches, catalogs and other data. Also take the following precautions to reduce a future occurrence:

- Close unused ports
- Require all passwords to be strong passwords
- Uninstall unnecessary applications and services
- Physically secure the computer
- Turn on auditing
- Install an antivirus program
- Install an Intrusion Detection System (IDS)
  - Software that monitors patterns of attack
- Or install an Intrusion Prevention System (IPS)
  - Software that monitors patterns of attack and automatically reconfigures the system to adapt to the attack
- Place the Web server behind a firewall

Restore and Monitor the Service

Use monitoring tools to determine whether an attack is occurring. Enable auditing tools, review the security logs regularly, and install third-party monitoring software.



Domain 3: E-Commerce Business, Marketing and Legal Issues - 19%

3.1 Identify the effects of e-commerce on business operations and revenue generation.

Traditional vs. E-Commerce Sales Methods

Traditional transactions occur manually and with little security. Electronic commerce transactions occur through any electronic medium (TV, fax or Internet) and adds the following capabilities:

- **Communication transport services**
  - These services support the flow of information between the buyer and seller.
- **Data management services**
  - Establishes a common digital language between server applications to complete electronic transactions successfully.
- **Security mechanisms**
  - The source of information is authenticated.
  - The information is guaranteed in its integrity and privacy.
  - Transactions do not occur between physical persons, therefore security is important.

Difference 1: Information Exchange

- Traditional
  - Information is exchanged through person-to-person contact, over the phone or by mail.
- E-Commerce
  - Information is delivered through computer networks.

Difference 2: Transactions

- Traditional
  - The customer acts based on the information that comes with the transaction.
  - Writes the check, signs the purchase order, etc.
- E-Commerce
  - Transactions occur through automated systems.
  - Transaction information automatically updates inventory levels, the ordering process, and statistical reports.

Difference 3: Physical Proximity

- Traditional
  - Allows non-repudiation.
  - Customer identity can be verified.
- E-Commerce
  - Non-repudiation and identification occurs digitally.
  - Information is secured across networks.
    - i.e. digital signatures, authentication and encryption frameworks

Difference 4: Supply Chain Management

- Traditional
  - Supply chains develop over years into models of high reliability.
- E-Commerce
  - Supply chains must be developed quickly which may result in an inability to meet demands.

Difference 5: Procurement

- Traditional
  - Typically complex manual process requiring multiple steps and contact persons.
- E-Commerce
  - Reduced steps and automated process.

Difference 6: Inventory and Order Control

- Traditional
  - In-house inventory and order control system work within a highly reliable supply chain system.
- E-Commerce
  - Integrated inventory and order control system with the Internet.

Migration from Traditional to E-Commerce

The first tool used in the migration is the use of automated applications which allow inventory and availability calculations that determine whether an order can be filled or that supplies need to be ordered. The second tool incorporates automated inventory control software to take the guesswork out of the inventory process. Orders can also be transmitted to suppliers and handle shipping information, and update inventory levels.

Advantages of E-Commerce

- Overhead is reduced by not leasing real estate, paying utilities, etc.
- Worldwide availability. The store is always open and is accessible to a global audience.
- Simplified communication and direct interaction between buyer and seller.
- Paperwork is reduced through digital transactions.
- Data entry requirements are eliminated which reduces errors and overhead cost.
- Delivery-to-payment times are reduced.
- Easy entry into global markets, no geographical limitations.
- New business opportunities through innovative e-commerce uses.
- User surveys provide improved market analysis.
- Instant access to expert assistance.
- Data collection improves product analysis.
- Automated purchasing, including: generating and sending purchase orders online.

Disadvantages of E-Commerce

- Increased vulnerability to fraud and misrepresentation
- Intellectual property
    - Duplication of information and illegal copying of copyright-protected material is easy.
- Confidentiality
    - Protecting financial information when it is transmitted over the Internet so that is not illegally read or compromised.
- Taxation
    - Sales tax payments are confused and states lose tax revenues
- Customs and interstate boundaries
    - Issues of illegal product sales into a country. Geographical limitations do not exist in e-commerce. Determining which law is broken and which entity should enforce it continues to challenge e-commerce frameworks.
- Regulations
    - Blurred lines on which government regulators enforce restrictions that invade privacy or hinder security.
- Credit card fraud
    - Legal protection in the area of credit card fraud is difficult to determine.
- Security
    - Lack of a consistent base line for authentication, non-repudiation, accountability and physical product delivery.
- Trust
    - Determining whether an online company can be trusted. The ease of establishing an online business contributes to fly-by-night companies.

- Availability 24 hours a day, seven days a week
    - This availability becomes a liability if service is disrupted.

Driving E-Commerce Growth

- Access
- Around-the-clock service
- Standardized data interchange formats
- Increasing bandwidth
- Enabling technology
- Cost
- Ease of access.
- Critical mass
- Physical location
- Diversification of offerings
- Centralization

Hindering E-Commerce Growth

- Fragmented data and data formats
- Fear of change
- Large segmentation
- Rapid change
- Increased competition
- Physical location
- Saturation
- Cost
- Restrictions
- Distribution

Reduce E-Commerce Site Costs

- Use remote management tools
- Use computer telephony (VoIP)
- Use scheduling software
- Use instant messaging to communicate
- Use remote conferencing
- Use webinar-based learning
- Use the Internet for EDI transactions

3.2 Identify legal and governmental issues in e-commerce.

E-Commerce Legal Issues

Companies now need to deal with electronic legal issues as well as traditional legal issues. In addition, traditional legal issues have moved into a new realm.

Some issues in e-commerce are:

- Internet commerce is negatively effecting brick-and-mortar
- Software products are being duplicated
- Intellectual property lines are blurred
- Jurisdictions become confused as crossing international boundaries becomes easier
- Ownership and control are impacted by a lack of physical boundaries
- Complaints can be disseminated faster.

Intellectual Property Issues

Ownership of information is being impacted by the rate of disseminations and modification that occurs online. Ownership of an idea or information is easier to challenge.

Intellectual Property Types

Industrial Property	**Copyrighted Material**
• Industrial designs ▸ Original or novel and registered	• Literary works
• Inventions ▸ Novel idea that solves a problem	• Musical works
• Trademarks and service marks ▸ Identifies goods or services through distinctive works, letters, drawings, etc.	• Artistic works
• International protection ▸ International treaties provide reciprocal protection	• Photographic works • Audiovisual works • Software

Copyright

- Addresses the issue of intellectual property ownership.
- Gives authors rights for a limited time.
  - Private author term: 70 years after death
  - Corporate author term: 95 years after first publication
- Includes all literary, musical, pantomime, choreographic, pictorial, graphic, sculptural, audiovisual, sound and architectural works.
- Elements: expression and originality.
- Law is unclear in reading some aspects of the Internet.
- Considered copyrighted when produced.
- Court cases.
  - Sega Enterprises Ltd. Vs. MAPHIA
  - Napster vs. the Recording Industry Association of America
  - Feist Publications Inc. vs. Rural Telephone Service Company

Trademarks and Service Marks

- Trademark defined:
  - "Any word, name, symbol or device, or any combination thereof, adopted and used by a manufacturer or merchant to identify his goods and distinguish them from those manufactured or sold by others."
- Service mark defined:
  - "Used in the sale or advertising of service to identify the services of one person and distinguish them from the services of another."
- Protected under common law and the U.S. Lanham Act
- Defined as property and grants exclusive right to a mark.
- Can be lost through abandonment, not renewing the registration, or degenerating into a household word.
- Domain names are a trademark or service mark.
- May be protected under the U.S. Patent and Trademark Office.
- Court cases.
  - Porsche Cars North America Inc. vs. Porsch.com
  - Intermatic Inc. vs. Toeppen
  - Kaplan vs. Princeton Review

Patents

- Document issued by a government that provides special right or privilege
- Governed by a federal statute
- Gives the inventor exclusive rights to use a process or to make and sell a product or device for a set amount of time
- Software patents do not cover the entire program
  - Covers algorithms and techniques
- Court case
  - Diamond vs. Diehr

International Intellectual Property Law

- Trade agreements between international entities
  - Include recognition of copyright and intellectual property protections
- Current efforts to supplement international property law:
  - The EU is creating the EU Copyright Directory
  - The World Intellectual Property Organization is coordinating international copyright protections

Taxation

The US prevents states from taxing transactions beyond their borders. The Internet Tax Freedom Act imposed a three-year wait on new Internet taxation and now has extended it until 2007.

- **Bit tax**
  - A tax that is based on the volume of digital information transmitted electronically. This does not include telecommunication transmissions.
- **International Tax**
  - The Internet Tax Freedom Act declares that the Internet should be free of foreign tariffs, trade barriers, and restrictions.
- **Customs**
  - Ensures legal compliance and protects goods entering and leaving the country.
  - Impacted because anyone can purchase anywhere.
  - Goods and services are shipped directly to the customer.
  - Goods may be sold that are restricted in the country of origin or destination.
- **Tariffs**
  - Defined:
    - Each international jurisdiction that a product passes through has its own taxes
  - Critical to selling internationally
  - Tariffs and trade practices may cause disputes

Ethics in Business

Ethics in business is difficult to define. Although an activity may not be illegal, it may be unethical. Unethical practices include:

- Selling customer information without the customer's knowledge
- Using spyware
- Spamming
- Posting misinformation about competitors on blogs

3.3 Implement effective marketing for an e-commerce site.

Web Marketing Benefits

The internet presents targeted advertisements that are not available through electronic media. Other advantages to web marketing are:

Personal selection - Users who click an ad are taken to the information they seek immediately. In addition the user who clicked is now a prospect.

Convenience - When a user sees an ad online, they can immediately go to the site. Unlike radio or television ads where the address is listed, but the ability to go there before distractions occur is not.

Interactivity - The Web provides interactive advertising opportunities. Advertisements can contain audio, video and interactive elements.

Online communities - Community is developed through the services a site offers. Television and radio do not create community.

Directed or opt-in e-mail - Allows users to subscribe for a service or product updates through an electronic mailing list. This provides targeted advertising opportunities.

Customized service - At some sites users can customize their experience through colors, layouts, and content choices.

Immediate purchasing - Web marketing meets the immediate purchasing needs of the consumer. The longer a consumer waits, the less likely they are to buy.

Global reach - Global advertising exposure is as simple as creating a web page.

Targeted reach - Marketing messages can be targeted to the market.

Web Marketing Strategies

Approaching web marketing requires a strategy. The first step is to identify the marketing goals. Second, identify the small steps that will accomplish the goals (strategies). Lastly, determine the tactics or steps to take to implement these strategies.

Web marketing strategies include: web site design, online promotions, targeted marketing, search engine placement, and traditional advertising.

Successful Web Marketing

Businesses excelling in web marketing typically use strategies that accomplish the following:

- Allowing customers to personalize their selections
- Providing an interactive online experience
- Integrating online and traditional advertising
- Personalizing the purchasing experience
- Providing competitive pricing
- Translating the web site and offerings into various languages
- Successful Marketers
    - Dell, Inc.
    - Cisco Systems
    - Amazon.com

Business-to-Business Marketing

The B2B market has changed its foci which have spawned new terms.

Market Terms

Term	Description
E-distributors	Providers of products or services directly to individual businesses.
E-procurement	Providers that organize the procurement process through access to digital market segments.
Exchanges	A.k.a. industry exchanges, B2B hubs or B2B portals that allow multiple sellers to provide access to buyers.
Industry consortia	Providers that are industry-owned and industry-operated vertical markets, and serve one vertical market.
Vertical market	A market that is centered in the same industry. Examples: auto, medical, etc.
Horizontal market	A market where products or services are sold across multiple industry types.
Direct goods	Goods that are used in the product. Defined by the company's context.
Indirect goods	Goods that are used to support production of the product. Also defined by the company's context.
Private market	A market that is limited to owners and members.
Public market	A market that is open to everyone.

Internet Marketplaces

Internet marketplaces are defined by how business is conducted. This marketplace is based on electronic communication. Transitions are handled on the Internet. This includes: buying, selling, inventory control, etc. These activities conform to various models:

- **Exchange model**
  - The exchange serves as a contact point for buyers and sellers
  - Allows buyers to browse multiple vendor offerings on the same website
  - Allows vendors to reach more customers with less effort
  - Handles orders for all vendors
  - Vendors must integrate communication with the exchange
  - Less desirable solution for high-volume requirements
  - Example: Techlistings.net

- **E-distributor model**
  - Designed around one type of vendor or horizontal market
  - Is seen as the B2B equivalent of a B2C e-tailor
  - Handles automated transactions
  - Example: Dell, Office Max
- **E-procurement model**
  - Similar to exchanges
  - Matches sellers to buyers
  - Provides value-added services
  - Example: Ariba.com
- **Industry consortium model**
  - Goal: bring buyers and sellers into a vertical market
  - Serves private markets (all others serve public markets)
  - Owned by the consortium members
  - Establishes communication standards that are agreed on by allmembers
  - A.k.a. private exchanges or wholly owned exchanges
  - Example: Dairy.com

Web Services

- Defined:
  - A web based server application that supports e-commerce transactions.
- Advantages:
  - Services are made available through the net.
  - Located through the UDDI protocol.
- Solutions:
  - Microsoft and Sun Microsystems.
  - Monetary converters.

Product and Service Positions

The following considerations must be made when choose the product or service to offer:

- **Hard goods or soft goods**
  - Factors effecting product success
    - Complexity
    - Information intensity
    - Contact
  - Soft goods
    - Product or service that is delivered through the Internet

        - Allows for immediate distribution (download)
        - Provides immediate gratification
        - Software, music, news, etc.
    - Hard goods
        - Items that can be seen or touched
        - Products that must be delivered via mail
        - Hardware, equipment, etc.

- **Product pricing**
    - When purchasing expensive items, customers want to see and touch the product
    - Shipping and time for inexpensive items may deter purchases
    - Best product pricing
        - Moderately priced products
        - Products that change pricing often
    - Pricing may be dictated by manufacturers
- **Market type**
    - Global market (mass)
        - The market is not constrained by geography
        - The customer base is large
    - Niche market (micro
        - Smaller customer base
        - Everyday market items
        - Target customers selectively
        - Blogs are gaining popularity in this market
- **Distribution and availability**
    - Dependent on type of good: hard or soft
        - Hard goods are shipped
        - Soft goods are downloaded
    - Considerations: ease of shipment, legality, local availability, shipping costs, return shipping costs

Target Markets

Ensure that your marketing message is going to the right buyers. Start by identifying buyers through the following data and methods:

Demographics

Demographics is the study of people. This study looks at a variety of common characteristics. Advertising campaigns are designed around target audiences identified through demographics. Determine your customer base by looking at the following demographics:

- Age
- Gender
- Race
- Income
- Location
- Education

Psychographics

Science that helps to anticipate positive or negative reactions to words, symbols, shapes, colors, etc. Lifestyles are measured to determine people's choices. The following areas are looked at in the measuring process:

- Activities and interests
  - What do people do
- Priorities
  - What is important to people
- Opinions
  - What do people think

Focus groups

This method tests products through targeted groups. Groups may be the company employees or outsiders. These groups help identify the audience and their buying habits.

Surveys

Surveys are collection instruments. Typical surveys will ask existing customers about the purchase experience, or will ask visitors why they are leaving the site. This information helps to mitigate site problems, supports customer service goals and provides insight into the customer's needs. A survey can collect demographics and psychographic data.

Designing a survey can be complex and requires experience. It is important to note that a survey is only as effective as the questions it asks.

Online Marketing Strategies

- **Banner ads**
- **Banner exchange**
- **Referrer sites**
- **Blogs and blogads**
- **Pop-up and related ads**
- **Search engine placement**
- **Spam e-mail**
- **Targeted e-mail**
- **Opt-in e-mail**

Banner Ads

- **Most abundant form of electronic advertising**
- **Response rates are 0.5 to 1%**
- **Highest click-through rate occurs between the third and fourth impression**
- **Effective up to four exposures**
- **Increases site traffic and leads to sales**
- **Does not increase brand awareness**
- **Not a magic advertising solution**
- **Banner Ad Terms**
    - **Ad clicks -** The number of times users click a banner ad
    - **Ad rotation** - Automatically changing ads in a given ad space
    - **Banner** - Web page advertisement that links to the advertiser's site
    - **Booked space** - The number of impressions sold
    - **Coalition for Advertising Supported Information and Entertainment (CASIE)** - Agencies that guide the development of interactive advertising
    - **Click-through** - When a user clicks on an ad
    - **Click-through rate (CTR)** - The percentage of ad viewings that results in a user clicking an ad
    - **Click stream** - Web page path visits
    - **Cost per click (CPC)** - Cost that advertisers pay Internet publishers based on the number of clicks
    - **Cost per thousand (CPM)** - The cost based on intervals of 1,000 impressions.
    - **Hit** - Whenever a file is sent to a browser (every time a user views a page it is one hit in addition to each graphic)
    - **Impressions (ad view)** - The number of times an ad banner is seen by users
    - **Log file** - This file tracks all Web server requests
    - **Page views -** The number of times a user requests a page containing a particular ad

  - **Unique users -** The number of different users who visit a site within a specific time period
  - **Visits -** The cumulative activity that occurs per user in a 30 minute time period is considered one visit

- **Banner Ad Options**
  - Questions
  - Calls to Action
  - Refreshed banners
  - Standard sizing
  - Minimal file size
  - Animation
  - Rich media ads
  - True claims
  - Visual quality
  - Obvious hyperlinks

- **Banner Ad Space**
  - Considerations:
    - Ad placement on web site
    - Location on web page
    - Ad size
    - Market specifics
    - Purchase price based on a set rate
    - Placement on web portals or web sites

- **Banner Ad Positioning**
  - Top of the page is preferred
  - Ads located where the page opens first has a better view rate
  - The lower the ad on the page, the less likely it will be seen
    - Note: even if the ad isn't seen, an impression would register

Banner Ad Exchange Networks

- Exchange banner ads with other Web sites
  - Reduces advertising costs
  - Drives business in two directions
- Effective in both B2B and B2C markets
- Join a banner exchange program
  - Earn credits every time a banner is viewed on your site

Referrer Programs

Referrer sites direct traffic on only one direction. One site pays the other for the traffic. The traffic is tracked through cookies, URLs, scripts, page redirects or special account codes. Many Web retailers support referrer programs.

Blogs and Blogads

- Blogs
  - Electronic web journals
  - Supplements traditional print and Internet media
  - Influential in politics and other areas
  - High-traffic segment of the Internet
- Blogads
  - New market segment
  - Small companies use it to advertise

Pop-Up and Related Ads

Pop-up ads are ads that open in another window without user interaction. These are seen as the most intrusive of advertising mediums. This perception has prompted Microsoft to incorporate pop-up blockers in Internet Explorer. Types of pop-up ads include:

- Pop-up
- Pop-under
- Interstitial
- Superstitial

Search Engines

A search engine database indexes (spiders) URLs, Usenets, FTP and image files. This maps Web content to Web sites. Web site owners register their sites with search engines, typically through software packages. There are two types of search databases:

- **Search Engines**
  - Loose term that covers both search engines and directories
  - Uses spiders to automate the collection process
  - Crawls through the Internet by following hyperlinks
  - Web designer influences placement on search sites
- **Directories**
  - Sites are manually entered into the database
  - Search results provide more accurate content
  - Web designer does not influence placement

Search Engine Placement

Web sites use meta-tags to help move the site up in search engine placement and allow people to find the site. Using meta-tags will help improve Web site standings The following tags are used for this purpose:

- **Keywords**
  - The keywords are separated by spaces or commas
  - Maximum number: 1,000

```
<META NAME="KEYWORDS" CONTENT="keyword1, keyword2, keyword3">
```

- **Description**
  - Appears as a short site description
  - Maximum: 25 words or 150 characters

```
<META NAME="DESCRIPTION" CONTENT="This site prepares you for the CIW exam">
```

- **Robots**
  - Tells spiders or crawlers what pages to index or not to index
  - NOFOLLOW attribute
    - Stops spiders from following links on the page
  - NOIMAGECLICK attribute
    - Only allows links to pages not images
  - NOIMAGEINDEX attribute
    - Indexes the text and not the images on the page

```
<META NAME="ROBOTS" CONTENT="NOINDEX">
```

- **Relevance**
  - Search results are ranked according to relevance
  - Common relevance characteristics:
    - Titles: scans the <title> tag
    - Beginning content: looks for query words at the top of the page
    - Frequency: counts the frequency of query words
  - Search engines:
    - weigh factors to determine a site's relevance
    - penalize a site for overuse of words (keyword spam)
    - do not catalog common words (or, and, the)

Keyword Guidelines

- Choose relevant keywords
- Use two word keywords
- Include multiple keywords
- Choose a domain name that includes your keywords
- Name Web pages using keywords
- Evaluate keywords on search engines to analyze the results
- Check for common misspellings and use in the meta tag
- Do not use common words (the, and, or, of, etc.)
- Create keywords that are singular and plural
- Abbreviate in both uppercase and lowercase
- Place most appropriate keywords at the beginning of the tag
- Put keywords into the <title> tag (maximum 70 characters)
- Place a descriptive summary paragraph using keywords in the first section of the <body> of the document (within the first 200 characters)
- Ensure that all images have ALT tags
- Make sure that the ratio of text to images is high. Do not use graphics exclusively
- Do not color keywords the same color as the background color
- Keep banner ads off the top of the home page
- Put JavaScript into a separate file and call it using a script
- Create a site map with links to all pages
- Use keywords for internal link text

Spam E-mail

This is unsolicited (junk) e-mail. Company credibility is damaged if spam marketing is used to promote a product or service. In addition, the e-mails may never reach the intended recipient due to spam blockers and black lists.

Targeted E-mail

This is spam that is tailored to a specific customer base and uses qualified, categorized e-mail addresses. This too, is not legitimate marketing and should be avoided.

Opt-in E-mail

This is the only legitimate form of e-mail marketing. The recipients must agree to receive this e-mail. This typically occurs during a registration process which makes it a follow up marketing method. Sometimes opt-in e-mail gets caught in spam filters. Email filters e-mail based on the sending address, the size of the address list and keywords in the subject or body of the message.

Ad Campaign Performance

Evaluate the performance of an online ad campaign by assessing data. The data can be collected by using tracking tools. Tracking tools identify the following:

- The number and percentage of visitors
- The visitor's type of operating system, browser type and domain
- The traffic flow by the hour, day, week and month

Tracking user activity is usually determined by the way advertising is set up on a site. Payments for user activity include pay-per-click, pay-per-lead, pay-per-sale and pay-per-view.

Ad Campaign Implementation

- Considerations:
  - Advertising budget
  - Type of campaign
  - Online and/or offline campaign
  - Tracking effectiveness
  - Incentives
    - Used to influence buying habits
    - Online incentives are similar to offline incentives
    - Affiliate and partnerships generates sales
    - Online purchase incentives vs. offline

3.4 Implement strategies for effective customer service and manage customer relationships in e-commerce operations.

Implementing Customer Support

Customer support is a business requirement. Using e-service methods provides a cost reduction in customer service. How the following methods are implemented will directly impact customer satisfaction:

- **E-service**
  - Asynchronous methods
  - Less expensive than synchronous methods
  - Considerations
    - Initial cost and ongoing support cost
    - E-mail is the most expensive due to personnel costs
  - Types
    - E-mail
    - FAQ
    - Knowledge-base systems

E-Service Action Plans

The key to effective customer service is in the planning. All departments should contribute to the plan. Before starting the planning process:

- Ensure that all planning parties know the customer, product, vendors, options, and requirements
- Choose support tools focused on reliable technologies
- Match the customer support solution to the customer
- Determine which customer support areas are priority and implement in stages

First: Design the Customer Service Plan

- **Support requirements -** Online documentation, product support and order support requirements
- **Most appropriate support methods -** Synchronous and asynchronous e-service methods determine support methods
- **Personnel needs -** Plan implementation, ongoing support, and management
- **Budget and schedule -** Determine the costs to enter information, implementation cost, and ongoing support costs

Second: Continually evaluate customer support performance

- **Ensure that customer needs are met in a cost-effective way**
- **Identify ways to build relationships**
- **Resolve issues quickly that negatively impact customer satisfaction**
- **Get feedback from customers -** Common methods: Web forms and follow-up e-mail. Cost-effective to use an outside company to collect feedback
- **Surveys -** Critical issues: what is asked, non-influential answers, use incentives to boost response rate, etc.

Customer Service Tools and Methods

E-service is based on communication. The following tools will support customer satisfaction:

- Synchronous Tools
- Asynchronous Tools
- Self-service

Synchronous Tools

These tools operate in real time with service personnel. The methods include telephone calls, chat, computer telephony and remote control.

- **Advantages**
  - Issues are resolved quickly
  - Improved customer satisfaction
  - Customers respond well to synchronous communication
- **Disadvantages**
  - Learning curve to use the service
  - Incompatible computer systems
  - Increase in personnel costs
- **Methods**
  - Chat
    - Allows immediate and specific information to be exchanged
    - Low-cost support
    - Familiar communication method
    - Established, stable technology
    - Easy to track and manage customer support personnel performance
    - Ability to save chat transcripts
  - Callback
    - Automated through the web site
    - Communication occurs through phone
    - The merchant pays for all calls
    - Requires a live person to answer
  - Computer Telephony (VoIP)
    - Transmits voice over the Internet
    - Operates like callback method
    - Toll-free to the customer
    - Computer hardware must meet minimum requirements
    - Requires a live person to answer
  - Remote control
    - Customer service personnel controls the customer's computer
    - Used for training and support
    - Walks the customer through issues
    - Requirements: sufficient bandwidth, secure connections, customer computer configured to accept remote connections

Asynchronous Tools

These tools do not operate in real time. The methods include e-mail, Web forms, and user forums.

- **Advantages**
  - Easier and less expensive than synchronous tools
  - Uses less resources
  - Easy to track and maintain
  - Cost-effective provides a better ROI
  - Relies on familiar technologies
- **Disadvantages**
  - Delay between the support request and the response
  - Is more difficult to give a personalized response
- **Methods**
  - E-mail
    - Most common form, but not always the most effective
    - May include focused prompts prior to sending the request
    - Convenient form of communication for both parties
    - Not effective for meeting urgent needs
  - Web forms
    - More structured form
    - Allows tracking and analysis
    - Easy inquiry distribution
    - Business controls the information requested
    - May be too restrictive
  - User forums
    - An ongoing conversation
    - Promote open-ended conversation
    - Easy way to get answers
    - Disadvantage: lack of control and inability to validate information
    - Outsources user support

Self-Service

These tools are readily available to customers on the merchant site. The methods include Frequently Asked Questions (FAQ) and knowledge bases.

- **FAQ**
  - Common to most Web sites
  - Cost-effect, easy to maintain
  - Address the most common problems
  - Users expect an FAQ
- **Knowledge Base**
  - Database that stores and retrieves information
  - Used to answer questions from customers, employees, partners, and vendors
  - Allows searching
  - May operate as a document management system

Practice Questions

Chapter 1 E-Commerce Site Development

1. Mark wants to know whether visitors to his website are leaving prematurely. What usability method will best serve that purpose?

   Select the best answer.

   - ❍ A. Controlled click patterns
   - ❍ B. Random click patterns
   - ❍ C. Paper-based walkthrough
   - ❍ D. Role playing

2. XYZ, LLC, is expanding their brick-and-mortar business to the Internet. The company wants to accept client payments online and provide medical laboratory results via the Internet. Which solution will work best for this company?

   Select the best answer.

   - ❍ A. Online instant storefront
   - ❍ B. Mid-level offline instant storefront
   - ❍ C. High-level offline storefront
   - ❍ D. In-house

3. Which of the following is not considered when choosing a storefront solution?

   Select the best answer.

   - ❍ A. The customer's ability to control the site.
   - ❍ B. The business' ability to administrate the site.
   - ❍ C. The customer's ability to interact with the business.
   - ❍ D. The client's ability to navigate and access the site.

4. What is the first step in building an online catalog using Commerce Server 2002?

   Select the best answer.

   - ❍ A. Create the base catalog by importing an XML file.
   - ❍ B. Define the catalog's name and default currency in Commerce Server's New Base Catalog window.
   - ❍ C. Define the catalog's category relationships in Commerce Server's Catalog Editor window.
   - ❍ D. Create a catalog definition by importing an XML file.

5. The XYZ company is implementing new employee training online. The company wants to easily reuse and deploy various learning content and manage trainees. Which of the following is the best choice to ensure that the company achieves their goal?

Select the best answer.

- ❍ A. Create a variety of learning objects based on Java Applets.
- ❍ B. Create SCORM-compliant learning objects and deploy them in an XHTML web page.
- ❍ C. Create SCORM-compliant learning objects and deploy them in a Learning Management System.
- ❍ D. Create SCORM-compliant learning objects and deploy them in a Content Management System.

6. When evaluating inventory systems, which of the following should you consider?

Select the best answer.

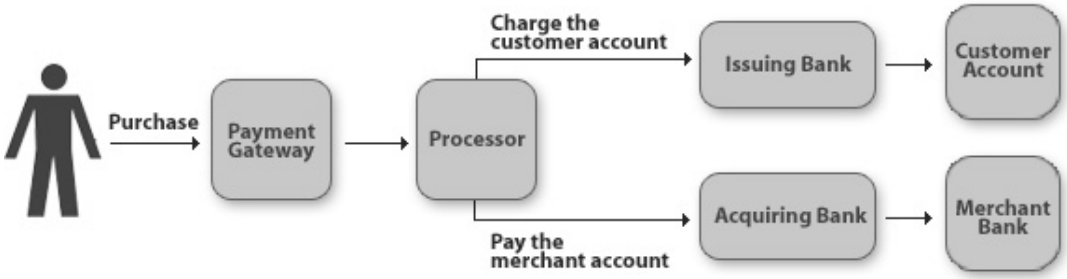
- ❍ A. Whether the system is SCORM compliant.
- ❍ B. Whether the system supports the operating system.
- ❍ C. Whether the system supports multiple payment methods.
- ❍ D. Whether the system interacts with virtual catalogs.

7. Which process is illustrated in the image?

Select the best answer.

- ❍ A. Credit card authorization.
- ❍ B. Validating the credit card through settlement.
- ❍ C. Credit card settlement.
- ❍ D. PayPal authorization.

Exhibit(s):



8. Which of the following transmits files to the Automated Clearing House for clearing?
Select the best answer.

- ❍ A. Originating Depository Financial Institution
- ❍ B. Receiving Depository Financial Institution
- ❍ C. Originator
- ❍ D. Receiver

9. In order to do business with customers in countries where Value Added Tax (VAT) is applied to the purchase, what must be configured to allow this type of purchase?
Select the best answer.

- ❍ A. The payment gateway.
- ❍ B. The processor.
- ❍ C. Electronic Funds Transfer (EFT).
- ❍ D. The shopping cart.

Chapter 2 E-Commerce Technology and Security

1. Which of the following is considered a vertical market?
Select the best answer.

- ❍ A. An online auction house.
- ❍ B. A European automotive dealer specializing in the restoration of vintage cars for sale in the US.
- ❍ C. A medical supply company that works with a pharmaceutical company to provide products to hospitals.
- ❍ D. A family farm that sells to a corporate farm.

2. What is procurement?
Select the best answer.

- ❍ A. The process used to buy supplies.
- ❍ B. A function of inventory management.
- ❍ C. A function that improves supply chain management by purchasing from multiple suppliers.
- ❍ D. Just-in-time delivery planning control.

3. Mike is converting the office purchasing system of purchase orders and invoices to an electronic data system. The company is operating on a tight budget and needs to cut costs. Which technology will meet Mike's needs?

   Select the best answer.

   - ❍ A. Open Buying on the Internet
   - ❍ B. Open Trading Protocol
   - ❍ C. Electronic Data Interchange
   - ❍ D. Web services

4. What is the function of a web server?

   Select the best answer.

   - ❍ A. Web servers provide pattern analysis to determine the site's navigability.
   - ❍ B. A Web server controls the flow of information and deploys server and client-side scripts.
   - ❍ C. Web servers develop complex storefronts and online catalogs for small to mid-size business.
   - ❍ D. A Web server creates Internet commerce enabled Web applications.

5. XWZ Company is a medium sized business that is struggling financially. In order to expand its offerings the company wants to move into e-commerce. The first step is to invest in a Web server. The company has asked its IT department to evaluate Web server software. Which Web server solution would be best choice for this company?

   Select the best answer.

   - ❍ A. Microsoft IIS 6.0
   - ❍ B. Sun Java System Web Server 6.1
   - ❍ C. Apache Web Server
   - ❍ D. Coldfusion Web server

6. Which of the following should be considered when choosing server hardware?

   Select the best answer.

   - ❍ A. The monitor
   - ❍ B. Firewire ports
   - ❍ C. Video card
   - ❍ D. Network interface card

7. XYZ Company has chosen to run its e-commerce offerings on Microsoft IIS 6.0 Web server. Which database is the best fit for this software?

   Select the best answer.

   - ❍ A. Oracle10g
   - ❍ B. SQL Server
   - ❍ C. MYSQL
   - ❍ D. Apache Xindice

8. Which of the following will restrict server performance?
Select the best answer.

- ❍ A. Network interface card
- ❍ B. Low resolution video card
- ❍ C. Payment gateway
- ❍ D. The queue

9. Martin wants to use an RSA algorithm for encrypting data. What cryptographic elements are needed?
Select the best answer.

- ❍ A. public key, ssl
- ❍ B. public key, hash
- ❍ C. public key, private key
- ❍ D. public key, message digest

10. Which of the following results in a certificate revocation?
Select the best answer.

- ❍ A customer has the public key.
- ❍ B. The Certificate Authority has a copy of the secret key.
- ❍ C. Two customers share the private key.
- ❍ D. The merchant has the a copy of the private key.

11. The XYZ Company's network administrator noticed the server was processing at a much slower rate. In addition, the server log files revealed that the server was receiving a large number of ICMP packets. What is the most likely reason for the server slow-down?
Select the best answer.

- ❍ A. The server was under a phishing attack.
- ❍ B. The servers was experiencing a pharm attack.
- ❍ C. The server's database was compromised.
- ❍ D. The server was experiencing a denial-of-service attack.

Chapter 3 E-Commerce Business, Marketing and Legal Issues

1. Which of the factors are hindering e-commerce growth?
Select the best answer.

- ❍ A. Fear of change, rapid change, distribution
- ❍ B. Fear of change, rapid change, taxation
- ❍ C. Fear of change, rapid change, critical mass
- ❍ D. Fear of change, rapid change, access

2. Which issue is an area of liability for electronic publishing?
Select the best answer.

- ❍ A. Customs and tariffs.
- ❍ B. Service marks and trademarks.
- ❍ C. Government copyrights.
- ❍ D. Jurisdictional restrictions on patents.

3. Creating a strategy for web marketing requires three steps. Which are the correct steps?
Select the best answer.

- ❍ A. Goals, strategies, promotions.
- ❍ B. Goals, objectives, tactics.
- ❍ C. Goals, strategies, tactics.
- ❍ D. Goals, objectives, promotions.

4. Which Internet marketplace is designed for horizontal markets?
Select the best answer.

- ❍ A. E-procurement model
- ❍ B. Industry consortium model
- ❍ C. Exchange model
- ❍ D. E-distributor model

5. XYZ Company is re-evaluating their customer service policies. The company wants to establish new customers. What can the company do to meet this goal?
Select the best answer.

- ❍ A. Set up a pay-per-click campaign and analyze the click patterns.
- ❍ B. Create a customer referral system with incentives.
- ❍ C. Contract with an email marketing company that sells lists.
- ❍ D. Accept returned goods.

Answers and Explanations

Chapter 1

1. Answer: B

Explanation A. Incorrect. Controlled click patterns direct the path of the visitor.

Explanation B. Correct. This method identifies paths that result in the user exiting the site.

Explanation C. Incorrect. This method is a sketch of the site hierarchy.

Explanation D. Incorrect. This method measures audience expectation.

2. Answer: A

Explanation A. Correct. This type of storefront is easy to implement and administrate, is inexpensive and requires minimal hardware requirements. Perfect for an entry-level company.

Explanation B. Incorrect. This type of storefront requires a level of expertise and must be installed locally.

Explanation C. Incorrect. This type of storefront requires a high level of expertise and dedicated hardware resources.

Explanation D. Incorrect. This type of storefront requires considerable expense and depth of hardware, software, and network implementation knowledge.

3. Answer: A

Explanation A. Correct. The customer interacts with the site, but does not need to control it.

Explanation B. Incorrect. This is an important point of the decision-making process.

Explanation C. Incorrect. The interaction must be a positive experience for the customer.

Explanation D. Incorrect. This is a key usability concept and must be a deciding factor.

4. Answer: D

Explanation A. Incorrect. This is a catalog that contains the actual product data.

Explanation B. Incorrect. The catalog has not yet been defined, so a name and currency cannot be assigned.

Explanation C. Incorrect. This is used to define products for cross-marketing purposes.

Explanation D. Correct. This contains the property, product, and category definitions for the catalog and must be completed first.

5. Answer: C

Explanation A. Incorrect. Applets are not a standard for learning objects and may not be supported by various software programs and browsers.

Explanation B. Incorrect. A system must be in place to deploy this type of learning object.

Explanation C. Correct. This combination will provide the reusable content and allow the company to manage trainees.

Explanation D. Incorrect. This type of management system does not support the management of learners.

6. Answer: B

Explanation A. Incorrect. SCORM is an e-learning standard and not used in inventory control.

Explanation B. Correct. The inventory system must be compatible with the operating system of the computer and the database software used to collect data.

Explanation C. Incorrect. Although transactions impact inventory levels, the inventory system is a special entity.

Explanation D. Incorrect. Inventory reductions effect the base catalog only. Virtual catalogs get product information from the base catalog.

7. Answer: C

Explanation A. Incorrect. The authorization process does not release funds.

Explanation B. Incorrect. The credit card is validated during the authorization process.

Explanation C. Correct. This completes the transaction. Monies are taken from the purchaser's account and transferred to the merchant account.

Explanation D. Incorrect. The authorization process does not release funds.

8. Answer: A

Explanation A. Correct. ODFI also originates ACH entries.

Explanation B. Incorrect. This is the financial institution that receives ACH entries. Makes funds available and reports on statement.

Explanation C. Incorrect. An originator initiates forwards transaction data to the ODFI.

Explanation D. Incorrect. A receiver authorizes an Originator to initiate a credit or debit entry to a transaction account at an RDFI.

9. Answer: D

Explanation A. Incorrect. The payment gateway acts as an intermediary between the merchants' shopping cart and the financial network and does not do the calculation for purchases.

Explanation B. Incorrect. This is the data center that connects to banks after the purchase amount is calculated.

Explanation C. Incorrect. This function collects check processing information.

Explanation D. Correct. This is where the purchase process starts and is managed.

Chapter 2

1. Answer: D

Explanation A. Incorrect. This would be a vertical market because it sells to various individuals and companies.

Explanation B. Incorrect. The auto dealer restores cars and resells to a variety of entities.

Explanation C. Incorrect. This is a horizontal market where complimentary venture benefits both companies.

Explanation D. Correct. A vertical market is one in which all the businesses are in the same industry.

2. Answer: A

Explanation A. Correct.

Explanation B. Incorrect. Inventory management involves tracking existing product.

Explanation C. Incorrect. This is a channel used to deliver raw materials.

Explanation D. Incorrect. JIT is a delivery system that delivers materials on an as needed basis.

3. Answer: C

Explanation A. Incorrect. This technology is designed for high-volume, low-cost transactions.

Explanation B. Incorrect. This technology is designed to support trade,

Explanation C. Correct. Specifically designed to handle purchase orders and other paper transaction documents.

Explanation D. Incorrect. This is a web-based solution that is designed for credit card purchases.

4. Answer: B

Explanation A. Incorrect. This is a usability action.

Explanation B. Correct.

Explanation C. Incorrect. This is the description for an IBM Websphere commerce server.

Explanation D. Incorrect. This is the function of Microsoft Commerce Server 2002

5. Answer: C

Explanation A. Incorrect. Due to the financial limitations of the company, the cost for this software is prohibitive.

Explanation B. Incorrect. Although this software provides support for various Web technologies, it is cost-prohibitive.

Explanation C. Correct. This open-source solution is free. In addition an IT department already exists to support the server, so additional support services are not required.

Explanation D. Incorrect. Coldfusion is a database solution, not a Web server.

6. Answer: D

Explanation A. Incorrect. The monitor is the least important option on a server. Choose small and inexpensive.

Explanation B. Incorrect. Firewire is used to transfer video. A server does not need that function.

Explanation C. Incorrect. Image quality is not important for a server.

Explanation D. Correct. This is a critical option. Choose the number and the throughput capabilities based on server needs.

7. Answer: B

Explanation A. Incorrect. This database works with IIS 6.0, but it is not the most compatible option.

Explanation B. Correct. Created by Microsoft it provides the best fit for IIS 6.0.

Explanation C. Incorrect. This is an open-source solution desgined for Apache web server. Although it offers a Windows version, it is not the most compatible.

Explanation D. Incorrect. This XML database id not a SQL database, therefore compatibility is in question.

8. Answer: A

Explanation A. Correct. If a network card or insufficient number of network cards creates a delay of incoming packets, server performance degrades.

Explanation B. Incorrect. The quality of what is viewed on the screen does not impact performance.

Explanation C. Incorrect. The payment gateway is housed on a different server.

Explanation D. Incorrect. The queue's size is relative to the number of requests. It is a container only and does not directly impact performance.

9. Answer: C

Explanation A. Incorrect. This type of encryption does not require ssl

Explanation B. Incorrect. Hash is not used in this type of encryption.

Explanation C. Correct. Asymmetric encryption requires both a public and private key. It does not use ssl.

Explanation D. Incorrect. Message digests are used in one-way encryption.

10. Answer: C

Explanation A. Incorrect. The customer is allowed the public key.

Explanation B. Incorrect. This is where the secret key originates.

Explanation C. Correct. The key cannot be shared or the certificate will be revoked. It is unique to the user.

Explanation D. Incorrect. This is required in order to authenticate the transaction.

11. Answer: D

Explanation A. Incorrect. Phishing is when pseudo messages are sent seeking personal information from the recipient.

Explanation B. Incorrect. This is when a Web site appears to be a legitimate bank or business in order to collect personal information.

Explanation C. Incorrect. This is when the password is hacked and then the database information is stolen.

Explanation D. Correct. This is when the server is flooded with packets.

Chapter 3

1. Answer: A

Explanation A. Correct. All of these prohibit the growth of e-commerce.

Explanation B. Incorrect. The method of taxation on the Internet is encouraging growth.

Explanation C. Incorrect. Critical mass pushes the growth of e-commerce.

Explanation D. Incorrect. The increased access to products and services has a positive effect on e-commerce.

2. Answer: B

Explanation A. Incorrect. This is an issue of taxation.

Explanation B. Correct. These are covered by national and international copyright laws.

Explanation C. Incorrect. Governments do not copyright, it is public domain material.

Explanation D. Incorrect. Jurisdictional restrictions do not protect patents.

3. Answer: C

Explanation A. Incorrect.

Explanation B. Incorrect.

Explanation C. Correct.

Explanation D. Incorrect.

4. Answer: D

Explanation A. Incorrect. This matches buyers and sellers.

Explanation B. Incorrect. This matches buyers and sellers in a vertical market.

Explanation C. Incorrect. This model provides the contact point for buyers and sellers.

Explanation D. Correct. This is the B2B equivalent of a B2C e-tailor.

5. Answer: B

Explanation A. Incorrect. This helps to identify keyword placement and Web site traffic.

Explanation B. Correct. This will generate new customers from existing customers, thereby increasing the customer base.

Explanation C. Incorrect. Sending unsolicited email will repel customers and violate the CAN SPAM Act.

Explanation D. Incorrect. This should be standard practice and is already expected by customers.