Components of E-Commerce  
Linda Wokosin

This article explains what you need to setup an e-commerce business starting with the basics of business and leading to the new technology of e-commerce.

Even though there has been many e-businesses that have failed recently, e-commerce is growing at a record pace. Many businesses are trying to setup store fronts in cyberspace, and many more are creating businesses for the sole purpose of selling stuff on the web.

There are two areas of concern when setting up an e-commerce business; back-end and front-end.

**BACK-END**

Before doing any work on the front-end web site you need to make sure the back-end is in place and working seamlessly. Most dot.com businesses that failed in the last several years didn’t have a good, solid back-end.

Setting up a back-end consists securing products or services, order fulfillment and customer service.

**Securing Products & Services**

There are several choices available to obtain products. You can manufacture and store the products yourself. Then package and ship orders to your customers when you receive them.

You can also purchase the products, then store those products in your warehouse. Then pack and ship the orders as you receive them.

Another option is to let the manufacturers of your products, store, pack and ship those products directly to your customers. Amazon.com uses this model.

**Customer Service**

No matter how the back-end is set up, exceptional customer service is necessary. One key to providing good customer service is by providing the status of the order, whether through e-mails or your web site.

Always remember, if a customer receives bad service, they’ll tell five to ten other people. If a customer receives good service, they’ll two or three people.

**FRONT-END**

Once the back-end is in place you can proceed with the front-end. There are five basic parts to setting up any e-commerce site:

1. Database
2. Dynamic HTML
3. Document Object Model
4. Security
5. Payment processing

**Database**

A database is needed to store customer information including:

- Name
- Address
- E-mail address
- Phone Number
- Preferred Shipping Method
- Payment Method
- Payment History
- Order History
- Current Items on Order

The database should also have information about all of the product and services offered including:

- Product ID
- Description
- Picture
- Thumbnail Picture
- Availability/On-hand quantity
- Shipping Costs
- Shipping Time
- Tax Tables (if applicable)

This database also needs to tie into the back-end systems for processing and shipping of orders. Either through a direct link or by importing and exporting the data.

**DHTML**

Dynamic HTML is needed to give your website special effects, interactivity and access to the database.
Special effects and interactivity for the site may include roll-over pictures, animated gifs and cascading menus and can usually be done using either VBScript or JavaScript.

Access to the database would need to be accomplished so users can see and select the products and services available. Before a web site can access a database it needs to be registered on the server hosting the site. Once the database is registered it can be accessed using either Active Server Pages or Java Server Pages.

**Document Object Model**

Document Object Model (DOM) is a W3C specification, not a standard, which means it’s still changing. DOM was developed to provide a standard programming interface that can be used in a variety of environments and applications.

DOM is a programming API for HTML and XML documents. The object model resembles the structure of whatever document it’s made for and defines the logical structure of the documents and the way it’s accessed and manipulated.

DOM can be used with any programming language to create and build documents, navigate their structure and add, modify or delete elements and content.

If the resources aren’t available to develop and implement a Document Object Model, Cascading Style Sheets could be used.

**Security**

There are two levels to securing information over the internet. The first level is a digital certificate. The second level is SSL (Secure Sockets Layer).

**Digital Certificates**

Digital certificates are electronic files that are used to uniquely identify people and resources over the internet. Digital certificates also enable secure, confidential communications between two parties. There are four types of certificates available.

**Certificate Authority Certificate**

This certificate is used by CA (Certifying Authorities), such as VeriSign or Entrust Technologies, to sign other certificates. A CA is a trusted entity whose main responsibility is certifying the authenticity of users.

**Server Certificates**

Web servers use these types of certificates to identify the company running the server and to allow for encrypted SSL (Secure Sockets Layer) sessions and SET (Secure Electronic Transactions) processing.

**Personal Certificates**

Individuals use personal certificates to they can send S/MIME messages and access web servers using SSL and SET.

**Publisher Certificates**

Software authors use this type of certificate to sign and identify their release codes so users know it hasn’t been tampered with.

**Certificate Information**

A digital certificate usually includes information about its owner and the CA who issued it. The information a digital certificate includes:

1) The name of the holder and other identifying information unique to the holder such as their URL or e-mail address.
2) The holder’s public key.
3) The name of the CA who issued the certificate.
4) A serial number.
5) The validity period of the certificate (start and end date).

**Public Key Cryptography**

Digital certificates are based on public key cryptography, which uses a pair of keys for encryption and decryption. With public key cryptography, keys work in pairs of matched “public” and “private” keys.

The public key can be freely distributed without compromising the private key, which must be kept secret by its owner.

Since these keys only work as a pair, an operation done with the public key can only be undone with the corresponding private key, and vice-versa.

**E-commerce security**

In order to do e-commerce you need the server hosting your web site to have a server certificate installed on it. This will tell everyone who visits your site that you really are who you say you are.

Server certificates take advantage of the SSL (secure sockets layer) protocol. Since SSL is built into all major browsers and web server applications, once you install a server certificate, SSL can be enabled.
The SSL (Secure Sockets Layer) protocol provides communications privacy over the internet. SSL allows client/server applications to communicate with each other while preventing others from eavesdropping, tampering or forging the information.

SSL allows the client and server to communicate with each other in a way that prevents the data being transmitted from being tampered with.

SSL requires all information sent between a client and a server be encrypted (by the server) when sent and decrypted (by the client) when received. SSL also has the ability to detect data tampering.

**How SSL Works**

1) A consumer enters a business’s site and accesses a secure page (indicated by a URL that starts with “https:").

2) The server hosting the business’s site then sends the consumer it’s server certificate which authenticates the site.

3) The consumer’s browser generates a unique “session key” to encrypt all of the communications.

4) A secure session is now established. Depending on the browser being used, the consumer may see a padlock on their browser’s information bar.

SSL server certificates come in two strengths: 40-bit encryption and 128-bit encryption. The higher the bit number the more difficult it is to break the encryption code.

**PAYMENT PROCESSING**

As mentioned earlier, there are three different ways to process payments over the internet: Cash Model, Check Model and Credit Model.

**Cash Model** The Cash Model (e-cash) is the creation of electronic money or tokens, usually by a bank, which buyers and sellers trade for goods and services.

**Check Model** In using the Check Model, the consumer presents a digital version of their check to a web storefront.

**Credit Model** In the Credit Model the consumer enters their credit card information and the payment is processed by an accredited organization, usually a bank, using SET (Secure Electronic Transaction).

**SET**

SET, which stands for secure electronic transactions, is used with the credit model and is the most common method of payment over the internet since it uses the existing credit card processing system.

**SET Overview**

**Step One.** The consumer enters an order along with their credit card information and sends it to the business.

**Step Two.** The business sends the consumer an invoice, their certificate and their bank’s certificate.

**Step Three.** The consumer acknowledges and approves this information and returns it to the business.

**Step Four.** The business then generates an authorization request for your credit card and sends it to their bank.
**Step Five.** The business’s bank then sends the credit authorization request to the Acquirer.

**Step Six.** The Acquirer sends an acknowledgement back to the business’s bank after receiving an acknowledgement from the consumer’s bank.

**Step Seven** Once the consumer’s bank authorizes payment, the business’s bank sends an acknowledgement back to the business with the authorization number.

![SET in action](image)

Steps one through three happen while you are placing your order on the business’s web site.

Steps four through seven are the same steps taken when you purchase something at a store. These steps are just taking place over the internet instead of at a cash register.

**INTERNET MERCHANT ACCOUNT**

After selecting the type of payment processing to use, the next step is to setup an Internet Merchant Account. The Internet Merchant Account needs to be setup with a financial institution that enables you to accept credit cards or purchase cards for payments over the internet and supports the following processors:

- First Data Merchant Service (FDMS)
- Paymentech (Salem)
- Vital Processing Services
- Nova Information Systems

Obtaining an internet merchant accounts can take between two days and three weeks.

**BIOGRAPHY**

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Linda Wokosin is a senior member of the STC. Being an active member of the STC, Linda has spoken at National and Regional conferences, judged at regional and national competitions and was president of the Carolina Foothills chapter.

Linda Wokosin has been designing web sites, creating software guides, help systems and CBTs both at her current position and as an independent contractor for more than six years. She has also taught classes and presented workshops on software products from eHelp, Adobe, Microsoft, Macromedia and Novell.