E-commerce Web site design: strategies and models

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Abstract
The rapid adoption of the Web as a commercial medium has caused firms to experiment with innovative ways of doing business. Those firms that effectively market themselves on the Web have a distinct advantage. This paper presents two e-commerce Web site design strategies and 12 e-commerce models for gaining that advantage.

Introduction

The Web is one of the most revolutionary technologies that changes the business environment and has a dramatic impact on the future of electronic commerce (EC). The future of EC will accelerate the shift of the power toward the consumer, which will lead to fundamental changes in the way companies relate to their customers and compete with one another (Slywotzky, 2000). The immense popularity of the Internet in recent years has been fueled largely by the prospect of performing business on-line. More and more companies set up their own corporate LANs by Intranet, apply Extranet and Internet to work collaboratively with their customers, suppliers, and partners. The Internet can bring down physical barriers to commerce, almost immediately giving even the smallest business access to untapped markets around the world. At the same time, consumers can conduct business and make purchases from companies previously unavailable to them. Furthermore, companies are able to place marketing material on Internet servers ranging from simple advertising to comprehensive virtual brochures. In today's global marketplace, fast reliable information is a necessity for most companies to attain some kind of competitive advantage. For instance, companies can create a virtual marketplace in which to sell their products. This virtual market is untapped and could reach millions of users on the Internet 24 hours a day.

Electronic commerce is defined as buying and selling of product, services or information via computer networks, mainly the Internet. As the fastest growing facet of the Internet and other information technologies, EC offers functionality and new ways of doing business that no company can afford to ignore. The basis for moving to an electronic commerce is a belief that electronic markets have the potential to be more efficient in developing new information-based goods and services, finding global customers and trading partners to conduct business. Electronic commerce via the Internet or the next generation Internet Protocol, IPv6, will change business institutions, operations and products/services as we know today, just as the telephone, TV, fax, and e-mail changed the way businesses and consumers communicate. Electronic commerce has become very popular because of the benefits and the convenience it brings along. As shown in Table I, the benefits include product promotion, cost saving, timely information, shortened remittance time, information consistency, better customer service, better customer relationship, customization of products, competitive advantages, and convenience of doing business.

Electronic commerce is no longer an alternative, it is an imperative. The only choice open is whether to start quickly or slowly. Many companies are still struggling with the most basic problem: what is the best EC model? Unfortunately, there is no simple answer for this question. Even companies in the same industry, of the same size, or with similar cultures are finding that one EC model does not fit all. Companies are required to review their EC models and rethink strategy in order to capitalize on the changing dynamics of the marketplace. The purpose of this article is to examine the currently available EC models and help readers to figure out the best way to make money in the EC era.

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Table I
The benefits of electronic commerce

Benefit	Description
Product promotion	Through a direct, information-rich and interactive contact with customers, EC enhances the promotion of products. Electronic medium also allows interactivity and customization for advertising content, based on the customer profile or input. EC thus offers an opportunity for new promotion strategies, enhancing the branding of products
Cost saving	By using a public shared infrastructure such as the Internet and digitally transmitting and reusing information, EC systems lower the cost of delivering information to customers, including personnel, phone, postage, and printing costs
Timely information	Due to their instantaneous nature, EC systems allow a reduction of the cycle time required to produce and deliver information and services.
Shortened remittance time	With electronic funds transfer (EFT), customers send their remittances electronically to the company's bank. This arrangement eliminates the time delay associated with the remittance in the mail system
Information consistency	EC ensures the consistency and accuracy of information through sharing of information and use of electronic forms for doing business
Better customer service	The ability to provide on-line answers to problems through resolution guides, archives of commonly encountered problems and electronic mail interaction 24 hours a day, 365 days a year, builds customer confidence and retention
Better customer relationship	EC enables the learning about customers due to its ability to record every event in which a customer asks for information about a product, buys one, requests customer service, etc. Through these interactions, the needs of the customer are identified and will feed future marketing efforts
Customization of products	The information-based nature of the EC processes allows for new products to be created or existing products to be customized based on customers' exact needs.
Competitive advantages	EC enables a company to achieve competitive advantages of: cost saving based on reduced advertising/promotion costs; product differentiation by customizing products and timely response to market; customer focus through better customer relationships and better customer services
Convenience of doing business	There is no limit on time and location to conduct a business with related parties. The information delivered to manufacturers, suppliers and warehouses is almost real time

Background

Hoffman *et al.* (1995) proposed a structural framework for examining the explosion in commercial activity on the Web. The study leads to a new classification of current commercial Web site designs as:
• online storefront;
• Internet presence;
• content;
• mall;
• incentive site; and
• search agent.

The authors examined the Web site designs in the context of integrated marketing and facilitated greater understanding of the Web as a commercial medium. This study, as well as those by Ju-Pak (1999) and Griffith and Krampf (1998) essentially perform Web site content analysis from an Internet marketing point of view.

Kalakota and Whinston (1996) classified advertising, sales, and customer service as the main consumer-oriented electronic commerce activities. In addition, Cappel and Myerscough (1996) identified five different ways that a "for-profit" company may use the Web for:
1 market awareness;
2 customer support;
3 sales;
4 advertising; and
5 electronic information services.

Liu *et al.* (1997) examined Web sites of US *Fortune* 500 companies to provide a status report of Web usage by these companies. They concluded that about 93 per cent of the *Fortune* 500 companies display their products and services on their Web sites, and about 26 per cent of them provide for some type of online business with their customers through their Web sites. A study of 250 US *Fortune* 500 Web sites, conducted by Palmer and Griffith (1998), illustrate the powerful impact that the Web has made on marketing practices. The authors argued that Web-based marketing activities and its site design are driven by the interaction among the firm's market offering, marketing activities and technical

characteristics. The marketing activities used in the study to examine corporate Web sites are:
- promotional activities;
- sales;
- service; and
- support.

From the seller's perspective, Angehrn (1997) proposed the ICDT model for analyzing and classifying EC strategies. The model describes four virtual business spaces, namely:
1 virtual information space;
2 virtual communication space;
3 virtual distribution space; and
4 virtual transaction space.

Based on the model, the authors suggest four EC strategies that are further refined by the level of sophistication and customization of the Web site design.

Watson *et al.* (1998) coined the concept of "attractors." An attractor is a Web site with the potential to attract and interact with a relatively large number of visitors in a target stakeholder group. Authors visited many Web sites and use metaphors to label and group sites into eight potential attactors:
1 the entertainment park;
2 the archive;
3 exclusive sponsorship;
4 the town hall;
5 the club;
6 the gift shop;
7 the freeway intersection; and
8 the customer service center.

They argued that the strategic use of hard-to-imitate attractors is a key factor in on-line marketing and creating an attractor will become a key component of the strategy of some companies.

The EC models for commercial Web site design to be examined in this article are similar to some of the models in the previous studies. However, we introduce a wider range of available models, extracted from the current commercial Web sites, than any previous studies. In addition, all models are discussed based on two different Web site design strategies, informational/ communicational strategy and on-line/ transactional strategy.

Web site design strategy

Web design has evolved from static hypertext publishing in the early days to dynamic multimedia, Web database application servers. More importantly, new business models that bring savings, revenues, and customer relationships are being incorporated into commercial Web site design. There are two generic Web site design strategies:
1 informational/communicational strategy; and
2 on-line/transactional strategy, summarised in Table II.

Informational/communicational strategy

In the informational/communicational strategy, the Web is used to support but not to replace a company's main business activities. Companies do not limit themselves to just marketing on the Web. As a matter of fact, they look at other traditional media of advertising and marketing study in order to meet their business goals and marketing objectives. Looking at Web marketing as another tool in the company's marketing arsenal (Clark, 1997), the informational/communicational design is the most common use of Web marketing today. Liu *et al.* (1997) report that 93 per cent of *Fortune* 500 companies have publicly accessible sites, but fewer than 26 per cent of those sites support transactions. On the other hand, there is no doubt that informational/ communicational design on the Web can also produce significant sales in other areas of business. For example, Insight Direct, a discount computer cataloger selling mostly to business, generates only 10 per cent of its sales from its on-line catalog, but more than 75 per cent of its new customers come from the site.

On-line/transactional strategy

The on-line/transactional strategy invariably provides an electronic catalog of products for sale. Visitors can browse through the catalog and order products on-line. Although the informational/ communicational design often provides an electronic catalog as well as ordering information (e.g. by phone, fax, or e-mail), it does not support on-line transaction. Without on-line ordering Web database capability, it hardly exploits the potential of the Web as an interactive medium.

The on-line/transactional strategy is what most proponents of marketing on the Web expect. Griffith and Krampf (1998) indicated that the ability to enhance a company's overall sales was a significant decision factor to establish a Web site. Although there are still some hidden obstacles (e.g. transaction security), it seems that most companies are likely to benefit directly from marketing on the Web, especially for small and medium-sized enterprises. In fact, there have been a lot of successful on-line/transactional designs, such as Amazon.com and Virtual Vineyards. The number of successful enterprises is

growing. There are reasons to believe that the Web will become a significant money-making vehicle for electronic commerce. International Data Corp. forecasts that Internet purchase volume will jump from $12.4 billion in 1997 to $425.7 billion by 2002. The US share is projected to be $268.8 billion, the European Union $55.5 billion, Japan $21.4 billion, and Asia $15.6 billion.

In the following section, available Web design models are grouped and discussed based on the two design strategies. However, the models in each strategy group are not mutually exclusive. For instance, a company may build brand awareness on the Web (the informational/communicational design strategy) and may do on-line retailing (the on-line/transactional design strategy) at the same time.

E-commerce Web site design models

There is no doubt that many Web design models exist on the Internet and new models are increasing expeditiously. EC is not just about doing business over the Internet, it is about changing the way companies do business. It is about creating new business models while transforming traditional ones.

After visiting many Web sites, a total of 12 Web site design models for EC were found, shown in Figure 1. The first four models that related to the informational/communicational design are:
1 brand awareness and image building model;
2 cost saving model;
3 promotion model; and
4 info-mediary model.

Brand awareness and image building model

Web sites that apply this model provide detailed, rational information about the firm and its offerings. They may also serve as a signal to current and prospective customers and competitors that the firm is on the cutting edge. The model reaches motivated customers with an information/image-rich communications message. Because the entry barriers are so low, smaller firms can set up this kind of site as well or in some cases even better than larger firms. Examples of the brand awareness and image building model include:
- Ford (www.ford.com) not only lists all the models of its seven famous automotive brands, but also posts its environmental policy, cleaner manufacturing, community involvement, and corporate citizenship report.

Table II
Web site design strategy

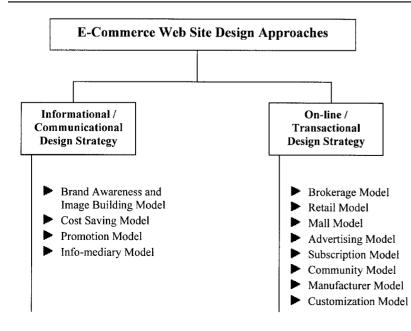| Web site design	Definition/characteristic	Promotion measures/ways	Merits
Informational/ communicational design	This approach is for companies to use the Web as a supplement to traditional marketing, delivering additional benefits to customers and building relationships with them	1. Putting companies' catalog on-line 2. Building broad awareness and image 3. Using the Web as a cost-effective way to augment their core products with related information and service function 4. Obtaining cost savings from automating routine customer services	1. Providing large quantities of information to customers 2. Giving a company an instant global presence and attracting people to one's ad, some of them are not the company's target market, but potentially will be 3. Opening a new communication channel allowing a company to develop further relationships with customers 4. All at a reasonable cost
On-line/transactional design	This approach is for companies to use the Web to construct "virtual business" – independent, profitable ventures that exist only on the Internet	1. Creating a retail presence larger than any physical store could 2. Creating a virtual business providing extra information in a form competitors cannot imitate 3. Creating a virtual business that takes a specialty product or collectible and sells it worldwide 4. Creating a virtual business that uses the Internet to produce superior economic benefits to customers that competitors can not imitate 5. Creating a virtual business providing convenience to customers that competitors cannot match	1. Providing a larger or more specialized selection of products than competitors can offer 2. Providing higher quality and higher quantity information, more economic benefits, and more convenience than competitors can offer 3. Providing a sense of community for customers

- Reebok (www.reebok.com) lets visitors read about sports and fitness, hear from Reebok-sponsored athletes, and learn about Reebok's human-rights activities, among other things.

Cost saving model

Saving from commercial activity on the Web includes cost-effective savings and productivity savings. By directly meeting information needs, a Web site can be highly cost-effective. Many companies now use their Web site to support the ownership phase of the customer service life cycle. Productivity savings arise from reduction in order and processing costs and more efficient inventory management. Cost savings result through reduced brochure printing and distribution costs and reductions in order-taking as customers use fill-out forms to prepare their own orders. As control is effectively transferred to the customer, customer satisfaction might actually be increased. Examples of the cost saving model include:

- Microsoft (www.microsoft.com) provides voluminous support material, live audio broadcasts of Microsoft conferences, product user groups, and free download of the patch and supplemental programs.
- FedEx (www.fedex.com) has a Web-based parcel tracking service. The Web site saves at least 100,000 shipment tracking requests a day. The savings from reducing the number of employees in answering standard customer inquiries are tremendous.

Figure 1
Emerging models of e-commerce Web site design

Promotion model

The promotion model represents a unique form of advertising that attracts a potential customer to a site. The objective is to attract the user to the commercial site behind it. In many cases, Web sites provide free gifts to get users' attention. The gifts typically include digitized material such as software, photographs, music, and consumer reports. Examples of the promotion model include:

- Auto-By-Tel (www.autobytel.com) offers a comprehensive consumer report for all major manufacturers. It attracts consumers to visit the site to read the report and compare the price. The Web site produces significant sales for local car dealers.
- Kodak (www.kodak.com) provides technical help and tutorials for its digital cameras and offers a library of colorful, high-quality digital images that are downloadable.

Info-mediary model

An info-mediary may offer users free Internet access or free hardware in exchange for detailed information about their surfing and purchasing habits. This is more likely to succeed than the pure promotion model. Data about consumers and their buying habits are extremely valuable. Especially when that information is carefully analyzed and used to target marketing campaigns. Some firms are able to function as info-mediaries by collecting and selling information to other businesses. The model can also work in the other direction: providing consumers with useful information about the Web sites in a market segment that compete for their dollar. Examples of the info-mediary model include:

- Audio Review (www.AudioReview.com) is a site that allows users to exchange information with each other about the quality of products and services – or the sellers with whom they have had a good/bad purchase experience. Other sites take the concept a step further by integrating an intelligent agent into a Web browser. Such agents monitor a user's habits, thereby increasing the relevance of its recommendations to the user's needs – and the value of the data to the collector.
- New York Times (www.NYTimes.com), a content-based site, is free to view but requires users simply to register (other information may or may not be collected). Registration allows inter-session tracking of users' site usage patterns and thereby generates data of greater potential value in targeted advertising campaigns. This is the most basic form of info-mediary model.

The following eight models that are based on the on-line/transactional design strategy include:
1 brokerage model;
2 retail model;
3 mall model;
4 advertising model;
5 subscription model;
6 community model;
7 manufacturer model; and
8 customization model.

These are popular models that provide on-line transaction services for companies to make profits on the Web.

Brokerage model
Brokers are match-makers. They bring buyers and sellers together and facilitate transactions. Those can be business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. A broker makes its money by charging a fee for each transaction it enables. Examples of the brokerage model include:
• eTrade (www.eTrade.com) is an on-line financial brokerage, where customers place buy and sell orders for transacting financial instruments. Also, travel agents fit into this category. In this model, the broker charges the buyer and/or seller a transaction fee. Some models work on volume and low overhead to deliver the best-negotiated prices.
• World Chemical Exchange (www.ChemConnect.com) is an increasingly common model in B2B markets. In this model, the broker typically charges the seller a transaction fee based on the value of the sale. The pricing mechanism can be a simple offer/buy, offer/negotiated buy, or an auction offer/bid approach.

Retail model
E-tailers are an Internet version of classic wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction. In some cases, the goods and services may be unique to the Web and not have a traditional "brick-and-mortar" storefront. Examples of the retail model include:
• eToys (eToys.com) is a toy business that operates only over the Web. The method of selling may be list price or auction.
• Lands' End (www.Landsend.com), a traditional catalog company, has now migrated from mail order to a Web-based order business. There is the potential for channel conflict. Catalog marketing can prove to be an asset if cleverly integrated into Web operations.

Mall model
An e-mall hosts many on-line merchants. The mall typically charges setup, monthly listing, and/or per transaction fees. The virtual mall model may be most effectively realized when combined with a generalized portal. Also, more sophisticated malls will provide automated transaction services and relationship marketing opportunities. Examples of the mall model include:
• Yahoo! Shopping (Shopping.Yahoo.com) is a cyber shopping mall. It allows customers to visit just one site for all their shopping needs. Since it is an attractive and well-promoted site, it attracts many more visitors than any individual store could.
• zShops (zShops.com) is a virtual mall, but one that will process the transaction, track orders, and provide billing and collection services. It brings buyers and on-line merchants to the mall and provides transaction services such as financial settlement and quality assurance. zShops protects consumers by assuring satisfaction with merchants.

Advertising model
The Web-advertising model is an extension of the traditional media-broadcasting model. The broadcaster, in this case, a Web site, provides content (usually, but not necessarily, for free) and services (like e-mail, chat, or forums) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model only works when the volume of viewer traffic is large or highly specialized. Examples of the advertising model include:
• Yahoo! (Yahoo.com) is a high-volume traffic – typically tens of millions of visits per month – driven by generic or diversified content or services. The high volume makes advertising profitable and permits further diversification of site services. Competition for volume has led to the packaging of free content and services, such as e-mail, stock portfolio, message boards, chat, news, and local information.
• Free Merchant (FreeMerchant.com) gives users free Web services, site hosting, and Internet access. Freebies create a high volume site for advertising opportunities.

Subscription model
Users pay for access to the site. High value-added content is essential. Generic news content, viable on the newsstand, has proven less successful as a subscription model on the

Web. A 1999 survey by Jupiter Communications found that 46 per cent of Internet users would not pay to view content on the Web. Some businesses have combined free content (to drive volume and ad revenue) with premium content or services for subscribers only. Examples of the subscription model include:
- Quote.com (www.Quote.com) is an example of a site profitably selling investment information. It creates a unique and "must have" content that draws investors to pay a subscription fee for the information.
- ESPN SportsZone (espnnet.sportszone.com) attracts more than 250,000 visitors a day with free, frequently updated sports information, while 50,000 subscribers pay $5 per month to access detailed background information, columns, reports, and more.

Community model
The viability of the community model is based on user loyalty (as opposed to high traffic volume). Users have a high investment in both time and emotion in the site. In some cases, users are regular contributors of content and/or money. Having users who visit continually offers advertising, info-mediary or specialized portal opportunities. The community model may also run on a subscription fee for premium services. Examples of the community model include:
- Family Radio (FamilyRadio.com) is a Christian radio station site. It is predicated on the creation of a community of users who support the site through voluntary donations. Not-for-profit organizations may also seek funding from charitable foundations to support the organization's mission.
- Guru (Guru.com) provides a source of information based on professional expertise and the experience of other users. It is typically run like a forum where persons seeking information can pose questions and receive answers from (presumably) someone knowledgeable about the subject. The experts may be employed staff, a regular cadre of volunteers, or in some cases, simply anyone on the Web who wishes to respond.

Manufacturer model
This model is predicated on the power of the Web to allow manufacturers to reach buyers directly and thereby compress the distribution channel (i.e. eliminate wholesalers and retailers). The manufacturer model can be based on efficiency (cost savings that may or may not be passed on to consumers), improved customer service, and a better understanding of customer preferences. The model has the potential for channel conflict with a manufacturer's established supply chain. Examples of the manufacturer model include:
- Micron (www.micron.com), a computer manufacturer, sells its computer directly to customers on the Web. Since there is no intermediary the distribution costs or cost-of-sales shrink to zero.
- Flowerbud (www.Flowerbud.com) sells fresh flowers directly to customers on the Web. Perishable products that benefit from fast distribution, like fresh flowers, may prove advantageous by eliminating middlemen.

Customization model
This model provides customers with content that is customized to meet their preferences. By completely customizing information needs, a Web site can be highly attractive to visitors. While this model represents a novel use of e-commerce technology, it is unclear how large a paying market exists for this kind of information. Examples of the customization model include:
- My.Netscape (My.Netscape.com) is a personalized portal. The generic nature of a generalized portal undermines user loyalty. The personalized portals allow customization of the interface and content. This increases loyalty through the user's own time investment in personalizing the site. The profitability of this portal in based on volume and possibly the value of information derived from user choices.
- Intelligent Agents (BargainFinder.com) are programs that answer to user problems with navigation in the chaos of the Internet. BargainFinder not only helps users find a good price but also learns from past user behavior to help optimize searches.

Summary
This paper studies the emerging models of e-commerce Web site design. The models are categorized based on different Web design site strategies. We identify two major Web site design strategies: "informational/ communicational design strategy" and "on-line/transactional design strategy." The models for informational/communicational design strategy include brand awareness and image building, cost saving, promotion, and info-mediary. The models for on-line/

transactional design strategy include brokerage, retail, mall, advertising, subscription, community, manufacturer, and customization.

Although a large number of companies use the Web as an advertising tool to build awareness or provide information rather than relying on the Web to do online transactions, we present eight e-commerce models that companies are using to make profits on the Internet. In fact, companies usually use more than one model to accomplish their e-commerce objectives. Although new models are beginning and are continuing to appear on the Web, no one knows which, if any, of these models will finally succeed.

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