

# eBUSINESS IN THE FOREST PRODUCTS INDUSTRY

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**The Wood Furniture Company is wired. Each quarter, the Employee Benefits Manager electronically sends out the latest 401K updates to all the employees of all the branches via the company's intranet. When company computers indicate low raw material inventories, the Purchasing Manager checks the company's extranets for their suppliers' current prices and inventory of particleboard and medium density fiberboard panels available for sale. She then places the order on-line and executes an electronic funds transfer authorization. The Vice President goes on-line to ask another furniture company's VP the status of a recent EPA ruling. The Sales Manager receives an order via an Internet-connected computer from a furniture retail store, as part of their Just-In-Time delivery agreement.**

The activities described in this scenario are examples of eBusiness, which is the application of Internet-based technologies for conducting business. eBusiness offers revolutionary tools for business development and management. Through the Internet, many barriers that were once roadblocks to new markets, resources, and competitive positioning can be reduced or even eliminated. In addition, the Internet levels the playing field by allowing small companies to be as visible and accessible as the largest companies. Although businesses vary greatly, along with their depth of participation on the Internet, their goals are often the same: to find new customers, new sources of profit, and new ways of doing business in a global marketplace (12)

## COMPONENTS OF eBUSINESS

The Internet creates a new business environment, different from any we've seen so far, because companies can conduct the majority of their business processes and practices on-line (3,5). It also provides a secure environment for the interchange of

critical data with business partners, customers, and suppliers (6). For example, Saatchi & Saatchi, one of the largest advertising agencies in the world, cut expenses by using the Internet, especially in the areas of long-distance phone calls, shipping costs, mail-delivery failures, and reshipping (10). In a dramatic example of cost reduction, Merisel, a \$3.5 billion wholesale distributor of brand-name computer hardware and software, has experienced a 70 percent decrease in order-processing costs with its business-to-business Internet activities (17).

This new business environment is called eBusiness. Perhaps the most important thing to understand about eBusiness is that it is first and foremost about business, not technology. Technology, while important, is not the limiting factor in eBusiness. What is difficult is managing the changes in business strategies and internal corporate processes that must take place for a company to take advantage of eBusiness (8). In other words, technology is just the facilitator in this new business paradigm. As mentioned, the vehicle for eBusiness is, of course, the Internet. Application extensions of

the Internet include intra-company networks (intranets) and Internet linkages with customers or suppliers (extranets).

## THE INTERNET

According to Netdictionary ([www.netdictionary.com/html/i.html](http://www.netdictionary.com/html/i.html)), the Internet is a worldwide network of networks that use TCP/IP communications protocol (the rules that provide basic Internet functions) and share a common address space. The network connection began as a government experiment in 1969 with four computers connected together over phone lines. The system was called ARPANET, after the Advanced Research Projects Agency of the U.S. Department of Defense (DARPA). By 1972, universities were granted access to the network, which was by then called the Internet. Commercial use of the Internet was established by 1983. Also known as "The Information Superhighway," the Internet is open to the public and supports services such as e-mail, the World Wide Web, file transfer, Internet Relay Chat, and others (15).

The forest products industry, as is the case with other industries, uses the Internet to communicate with current and potential customers via e-mail, for promotion via the Web, and for business applications. The survey described in this article indicated that 45 percent of the industry has a Web page, while a recent study by Pitis (20) showed that over 80 percent of forest products exporters have a Web page.

## INTRANETS

An intranet is a *private* network used exclusively within (hence the term "intra") a company or organization. It uses Internet technology, but does not necessarily function through the Internet. Access is limited to employees or organization members only.

A company may use an intranet to facilitate communications among its members and deliver information and/or services to employees. This is particularly useful in large, multi-site organizations (9). For example, one large integrated forest products supplier in the United States has linked all regional offices and personal computers to the company intranet. In other words, potentially, any person in the company can examine reports and business information from any other computer or location.

## EXTRANETS

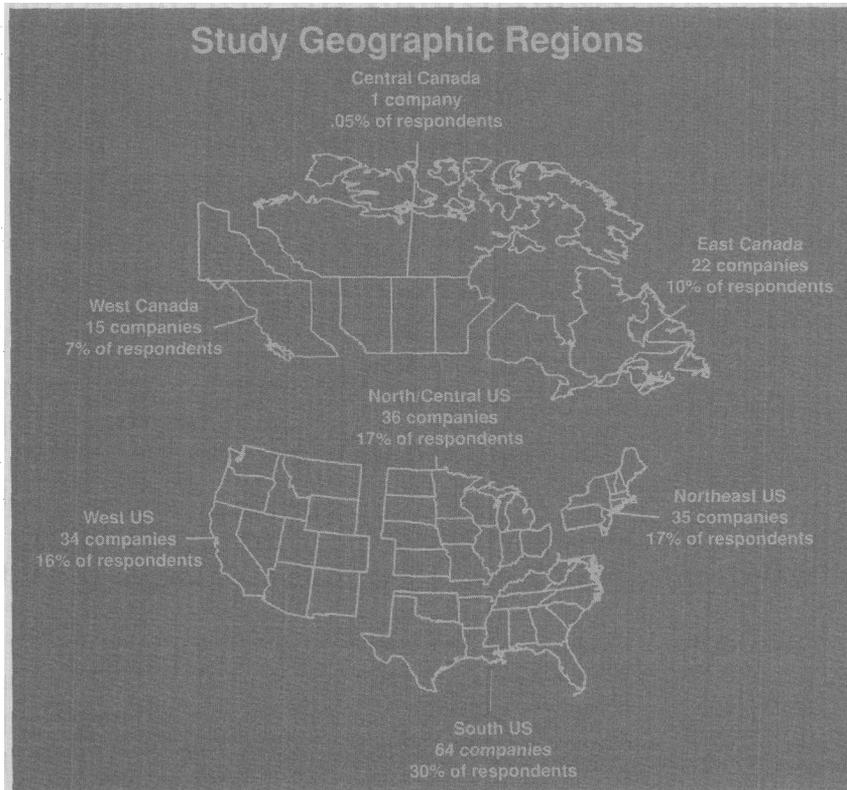
The term "extranet" is credited to Ethernet inventor Bob Metcalf (15). There is still some confusion over the exact definition of an extranet, but the most commonly accepted definition seems to be "a network that links business partners to one another over the Internet." This linkage is usually accomplished by companies allowing their partners access to certain areas of their company's intranet (2,8). An extranet could be thought of as an extended intranet, connecting multiple organizations such as internal personnel, customers, suppliers, and strategic partners in a seamless closed-user group. Even though a company extranet is on the Internet, access is not available to the public due to carefully constructed firewalls that limit participation (21).

With regard to the forest products industry, in a 1998 study of the United States and Canada, 10 percent of respondents were found to have an extranet (24). Because the forest products industry's general tendency is to lag behind other corporate sectors in technology adoption, this figure is significant, given the advanced nature of extranet technology and business applications.

Because extranets are more "secure" and they are designed to facilitate business activities, applications tend to go beyond marketing and promotion. In the forest products industry, order management such as tracking, order status, and shipping notices

	INTERNET	INTRANETS	EXTRANETS
<b>What is it?</b>	The information superhighway.	The use of Internet technology within a company or organization.	A network that uses the Internet to link company intranets in order to enhance business-to-business relationships.
<b>Access</b>	Open	Private	By agreement only
<b>Users</b>	Public	Organization members	Business partners
<b>Information</b>	General	Proprietary	Selective

Table 1. Internet, Intranets, and Extranets.



**Figure 1.**

were found to be the most cited extranet applications in 1997 (24). Increased access to industry information, timeliness of information exchange, increasing exposure to customers and increasing access to customers were the top-ranked benefits that companies receive from having an extranet (24).

Table 1 summarizes the similarities and differences between the Internet, intranets, and extranets (4,14,22).

As is the case with corporate America in general, the forest products industry is rapidly expanding its

use of these technologies to conduct business. Although much has been written about Internet business applications in other industrial sectors, aside from a 1997 article by Vlosky and Fontenot (25), little has been written about eBusiness in the forest products industry.

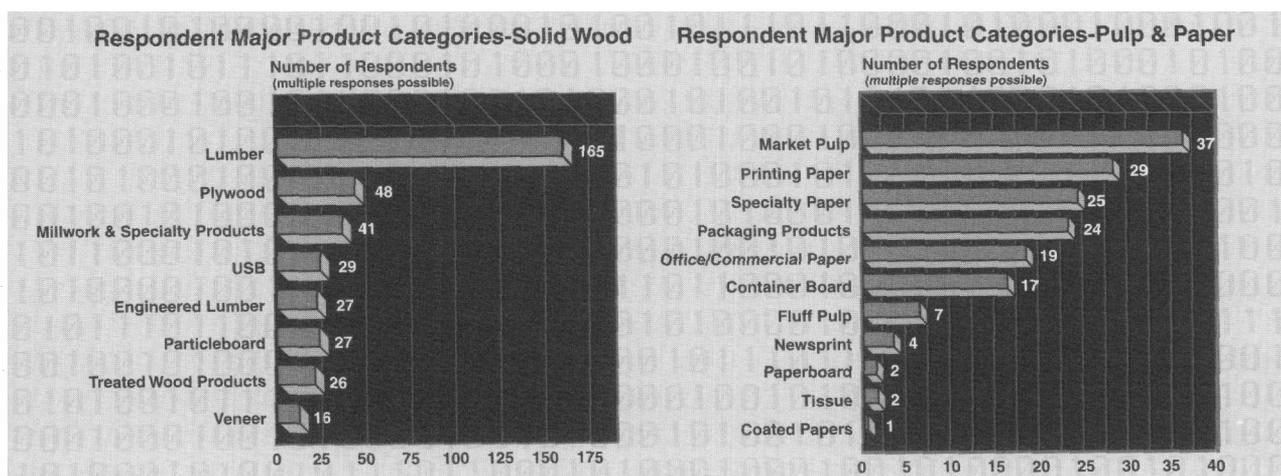
## RESEARCH CONTEXT

eBusiness was studied in the context of the forest products industry in the United States and Canada: 1,000 solid wood products and 300 pulp and paper companies were surveyed. The sample frames included the top 100 companies (by production volume) in each sector (solid wood products, pulp and paper). The remaining companies sampled were randomly selected from the population. Respondents were asked to discuss their current or planned eBusiness strategies and impacts on interactions with customers and suppliers. Specifically, the study objectives were to:

1. Examine the current and future uses of eBusiness in the industry.
2. Identify how the forest products industry invests in and benefits from eBusiness.

## DATA COLLECTION

Mail questionnaires were used to conduct the study. A list of questions was generated for the survey instrument drawing from constructs and measures developed by the researcher in previous stud-



**Figure 2.**

ies or adapted from other sources. The survey was reviewed and revised by the researcher, a pre-testing sample of five companies, and the research client. An iterative process resulted in the final instrument.

The questionnaires were mailed to companies selected from the Lockwood-Post Directory of Pulp and Paper Companies (13) and the Miller-Freeman Directory of the Wood Products Industry (16). Preaddressed, postage-paid envelopes and a personally signed cover letter were included with the questionnaire. In addition, a copy of an article on Internet use in the forest products industry (25) was included as a means of encouraging participation. The cover letter also promised summary results of the study for completing and returning the questionnaire. The study results are based on two mailings with all surveys sent to pre-identified key informants by name and title. All industry survey respondents were surveyed at the corporate headquarters level.

## RESPONSE RATES

For the two populations surveyed (solid wood products, pulp and paper), the adjusted weighted response rate after accounting for non-deliverable surveys (due to company closures, change of

address, or deceased) was 18 percent. Given that typical response rates for industrial studies range from 15 to 35 percent (1,7), a response rate of 18 percent in this study is considered adequate. Tests for non-response bias were performed and none was detected.

## RESPONDENT GEOGRAPHIC DISTRIBUTION

Figure 1 shows the geographic distribution of the respondents who indicated their corporate locations. All regions of the United States and Canada are well represented in the study.

## RESPONDENT PROFILE

Over 60 percent of respondents had 1997 sales of \$49 million or less while 21 percent had sales of a half billion dollars or more. Forty-four percent of respondent companies have 100 employees or less while 23.7 percent have over 1,000 employees.

The products produced by respondents are shown in Figure 2. In the pulp and paper sector, market pulp, printing paper and specialty papers were the products most cited. For the solid wood products sector, lumber, by far, was the most frequently

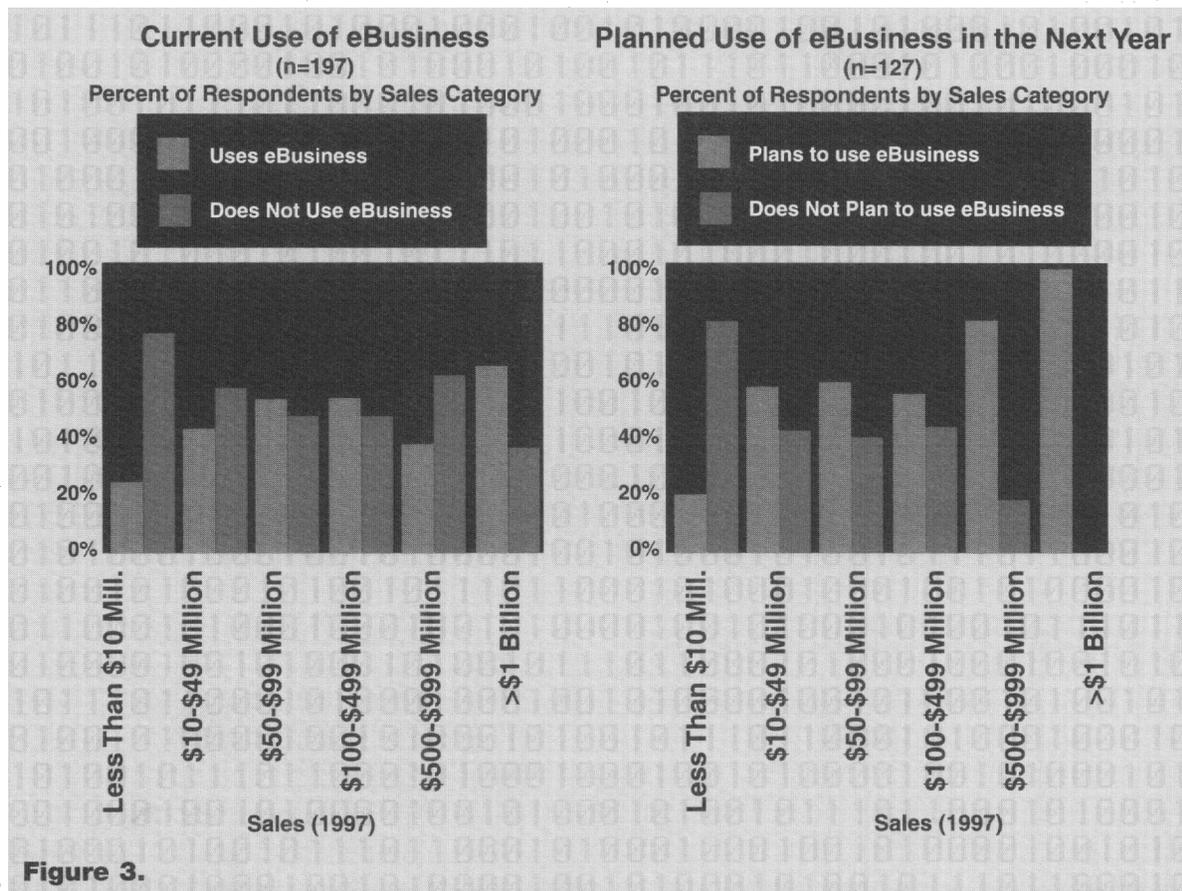


Figure 3.

When eBusiness Capabilities Were First Developed

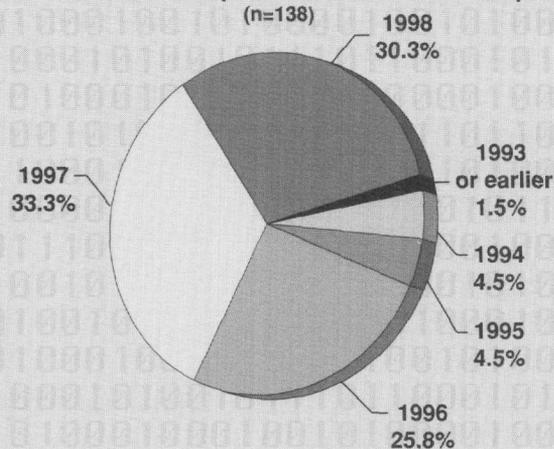


Figure 4.

Investment Made to Date on eBusiness Applications

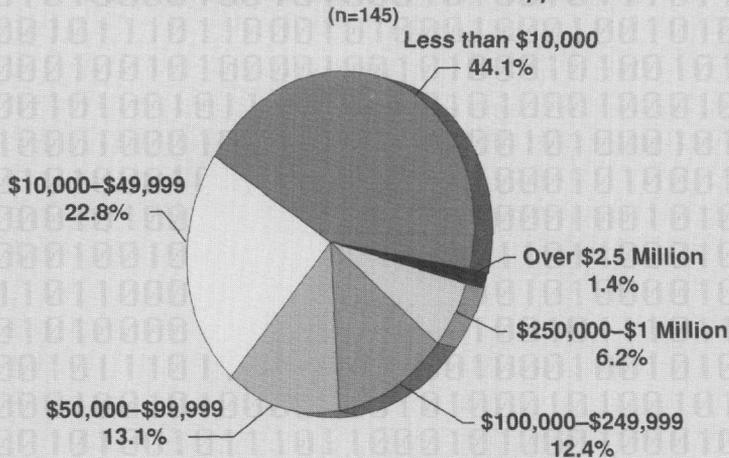


Figure 5.

Implementation of eBusiness by respondents has taken place in the recent past. Figure 4 shows that 89.4 percent of respondents developed these technologies in the past 3 years. Earlier implementation (before 1996) was done by larger companies; large companies are typically lead adopters of technology. With regard to investments, 22 percent of respondents spent \$1 million or more on information technology (IT) in general in 1997. IT is all computer-based technologies that a company can potentially use, including PCs, printers, mainframe computers, telephone systems, etc. However, funding for eBusiness is relatively low, as seen in Figure 5, which shows total eBusiness expenditures made to date. Forty-four percent of respondents spent less than \$10,000, primarily for Web home page development. About 8 percent spent more than \$250,000 for more sophisticated applications such as Internet-EDI and eCommerce.

EDI (Electronic Data Interchange) is the movement of business data electronically between or within firms (including their agents and intermediaries) in a structured, computer-processable data format. EDI permits data to be transferred without re-keying from a computer-supported business application in one location to a computer-supported business application in another location (11). eCommerce (electronic commerce, or selling products and services online) represents a new way of bringing vendors and customers together. The convenience and flexibility of the Internet, its suitability for micro-marketing, reduced operating costs, and the ability to integrate with Just-In-Time (JIT) inventory systems achieves significant savings in inventory management, provides cost benefits, enhances customer relationships, and overall is often a more effective way of selling products (20).

manufactured product. In order to represent the industry in aggregate, results are presented for solid wood and pulp/paper respondents combined.

Fifty-eight percent of respondents said that large companies were their primary customer base. This included wholesalers, distributors, and retailers, at 22.4 percent, 21.9 percent, and 13.2 percent of respondents, respectively. This has implications for eBusiness as the majority of early adopters in Internet-based technologies are typically larger companies that often do business with larger, technology-capable customers.

## USE OF EBUSINESS TECHNOLOGIES

Sixty percent of respondents said their companies do not currently use the Internet to conduct business. Of these, fifty-six percent said their company does not have plans to develop such capabilities in the future. Larger companies were most likely to have adopted Internet technologies and are also more likely to do so in the future (Fig. 3).

## EBUSINESS APPLICATIONS

Respondents were asked to identify eBusiness practices that they currently use or plan to use in the next year (Fig. 6). Customer contacts were the most frequently cited practice (47% of respondents) closely followed by having a home page (45%) and marketing (44%). The next tier of applications included vendor contacts (33% of respondents), product promotion (32%), products or price inquiries (31%), and sales to customers (eCommerce) (31%). Although one tends to think of

using the Internet for sales to customers, purchases from suppliers is also done. Eighteen percent of respondents indicated that they currently, or planned, to make purchases from vendors. At the bottom of the list are order administration activities such as shipping notices, order tracking, inventory management, and overall logistics.

## BENEFITS OF IMPLEMENTING eBUSINESS

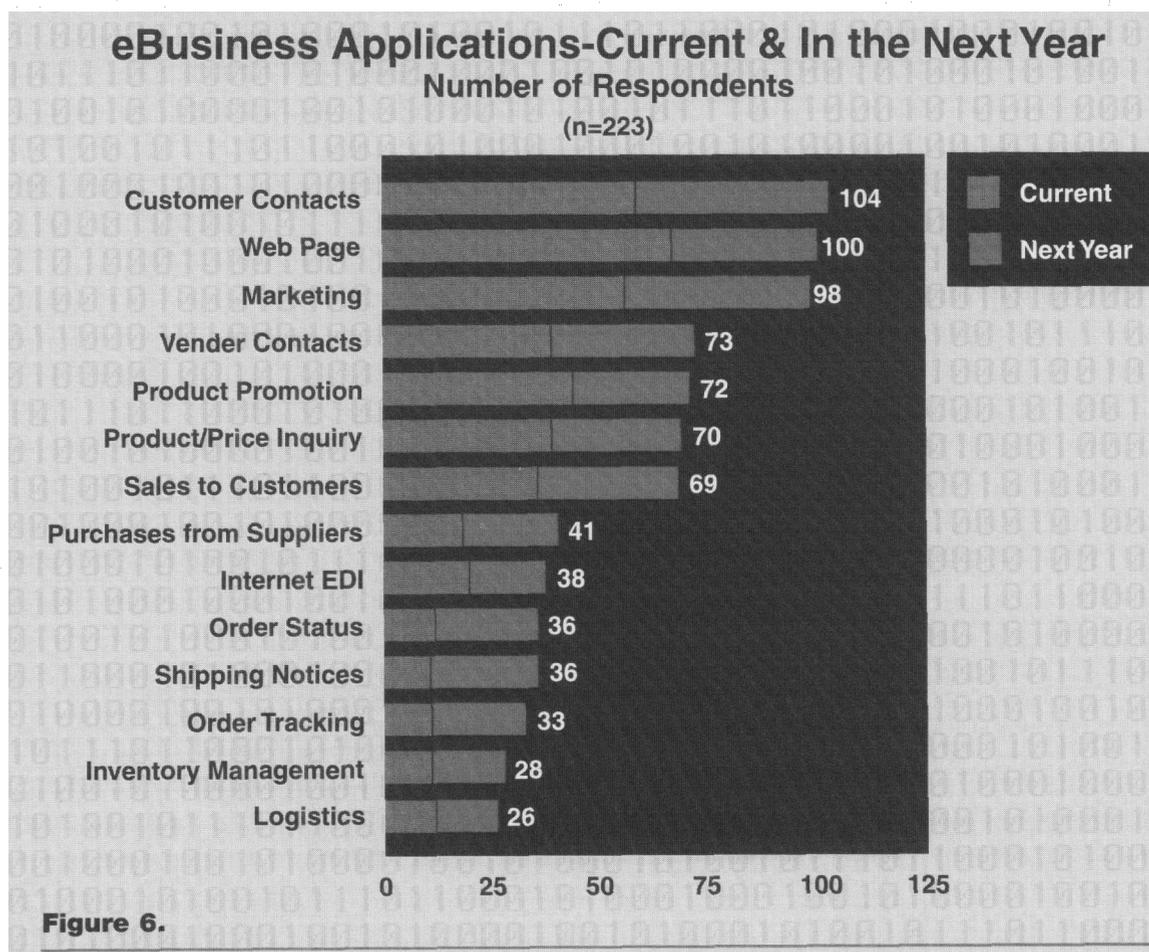
The primary reason respondents implemented eBusiness was as part of an overall corporate strategy (mean of 3.5 on a 5-point Likert scale of agreement). These technologies are well-planned activities that are meshed into the corporate fabric as opposed to being independent or non-integrated. Second, and the only other reason ranked above neutral (3.0 on the 5-point scale), was the goal of retaining customers. This can be accomplished by keeping companies in more frequent contact with customers via e-mail or through Web information.

Respondents also identified benefits that their companies receive from conducting eBusiness (Fig. 7). Electronic interactions, if managed correctly, can result in faster communication and increased

responsiveness. Accordingly, the highest-ranked benefits are increased access to industry information, timeliness of information exchange, greater exposure to potential customers, and greater access by potential customers. Also ranking high on the list are enhanced corporate image, increased access to vendors, increased sales, and increased value to customers. Ranked last is lower prices to customers. This supports other studies that found that eBusiness technologies are viewed as being competitive in nature and have not been found to translate to expectations of lower prices to customers nor expectations that higher prices will be paid to vendors in the forest products industry (20,25).

## CONCERNS AND IMPEDIMENTS TO IMPLEMENTATION

Respondents registered a number of general concerns they have about conducting eBusiness. As has been found to be the case in previous Internet studies (12,20,24,26), concern about security of information ranks high on the list (Fig. 8). Any time computers are physically linked to the Internet, security concerns increase. Simple links to the Internet can be effectively managed using a firewall, which is a



### Benefits from eBusiness

(n=207)

Scale: 1=strongly disagree to 5=strongly agree

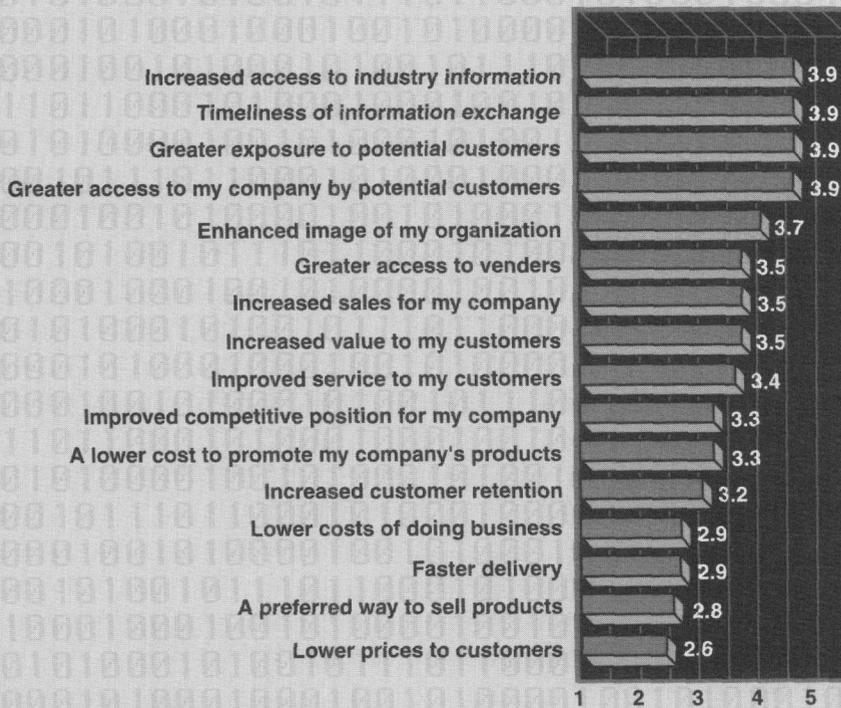


Figure 7.

### Concerns about Using eBusiness

(n=205)

Scale: 1=not a concern to 5=is a major concern

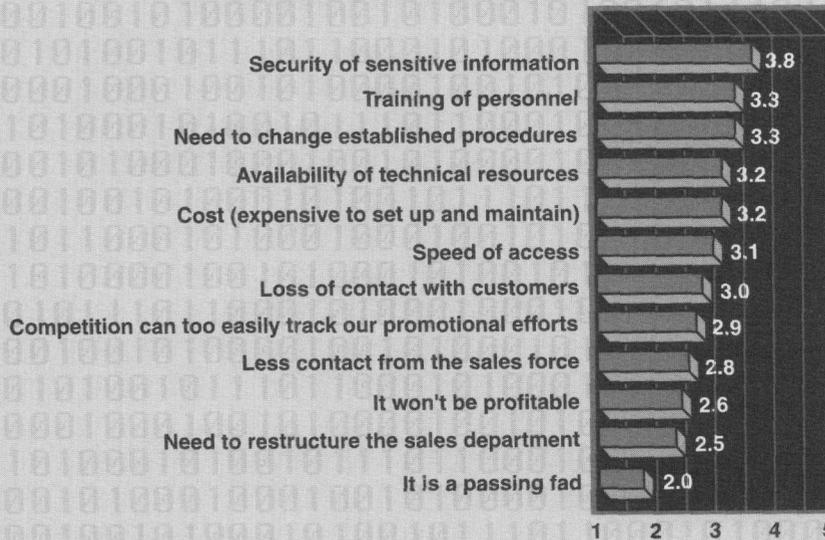


Figure 8.

computer hardware/software gatekeeper between the Internet and intranet that monitors and regulates incoming and outgoing electronic traffic (23). Companies that conduct eBusiness must find ways to protect the confidentiality of information as it travels from sender to intended receiver. This is accomplished with various encryption schemes.

Referred to as "tunneling" or the creation of a virtual private network, secure use of the Internet for business communications has not yet been standardized, although a number of proven technologies exist today. Companies considering development of an Internet-based partner linkage should seriously evaluate security measures as they explore options.

Training of personnel and the need to change established procedures ranked second on the list of concerns. Availability of technical resources, implementation costs, and concerns about speed of access to the Internet ranked next. The balance of possible concerns all ranked neutral (3.0 on a scale of 1 = not a concern to 5 = is of great concern) or lower. Ranked last is the concern that the Internet is a passing fad. Respondents are in almost total agreement that the Internet is here to stay.

There were no serious perceived impediments to eBusiness implementation. The impediments that had the highest reported mean (3.2 on a scale of 1 = is not an impediment to 5 = is a significant impediment) were a lack of understanding in the organization about the benefits of eBusiness and a lack of an adequately trained IT staff. Respondents indicated that there is very little resistance from customers in implementing these technologies (1.8 on the 5-point scale).

Respondents were asked whether their Internet implementation was on schedule and whether they had received the anticipated benefits. Sixty percent said they were not where they wanted to be in implementation primarily due to a lack of time, personnel, and resources. Over two-thirds responded that they have not

received the desired benefits from eBusiness implementation. This may be due to a lack of realistic expectations, insufficient resources, or a poorly planned or nonexistent eBusiness strategy. However, many respondents were able to offer examples of considerable benefits they have received from eBusiness (Table 2).

- **Faster response to customer inquiries.**
- **Quicker location of potential customers for our products.**
- **Savings on overseas long distance charges.**
- **By advertising on a supply database, we have obtained new customers.**
- **Customers can look up order and shipment status on-line, which reduces phone calls to reps and allows them to handle orders rather than inquiries.**
- **We have generated far more sales than could have been generated without an Internet presence.**
- **Better and quicker service for customers.**
- **Prospect/customer can understand our company easier and get up-to-date product information.**
- **Faster, easier purchase of needed items from vendors.**
- **The quickest, easiest in the publication of documents such as policies and related forms, employee directories, technology standards, etc.**
- **Publishing calendar event updates saves time and money.**
- **Savings from direct and indirect distribution and access costs of information.**
- **We have reduced inventory by broadcasting available stock to customers via the Internet.**
- **Better inventory control because of better information on in-bound product locations and ETAs.**
- **We increased market share in large developing accounts by managing customers' inventory on-line.**
- **Faster response to customers' and suppliers' needs.**
- **We put pictures on the Internet showing how we make our products better. Customers 1,000 miles away can take a "virtual tour" of our company and see who they are dealing with.**
- **Marketing/ Advertising - information about the company via the Web.**
- **Mass e-mail communications to customers and vendors has reduced our costs.**
- **Electronic sales of industrial products, (hardwood, lumber, plywood, etc.) both internationally and nationally replaces salesmanship with bidding.**
- **Our website has helped us develop new customers.**
- **Time saved to communicate to headquarters overseas.**
- **Direct sales relating from Web exposure.**
- **Shorter lead-time.**
- **Our truck line information system provides Web browser accessible information to trucking line scheduled to ship our out-bound finished product. This has made it much easier for us to look at bad planning and loading internally and greatly reduced the work associated with communicating with the 20+ trucking lines that service our largest facility.**
- **We set up an inventory system at a customer's warehouse using the Internet.**
- **Insures mill spare parts inventory (categories with high rotation) by automatic re-order.**
- **Cost of searching out year 2000 solutions has been reduced through extensive use of Internet.**
- **Accessing information from suppliers greatly reduces lead-time as well as allowing better price shopping.**
- **Price list previously faxed at considerable expense is now on-line.**

**Table 2. Specific Examples of How Respondents Benefit From eBusiness.**

Forty-nine respondents said that they did not currently nor plan in the future to conduct formal reviews or audits of their eBusiness implementation. Eight respondents said they planned to do a review at some time in the future. This lack of follow-up audits may also contribute to the perception that expectations are not being met. If one does not conduct a post-implementation audit of a business practice, it is difficult to make accurate assessments and improvements.

Respondents were asked if they might have done anything differently in implementing eBusiness in their company. Many of their responses involved utilizing better-trained personnel in implementation, outsourcing expertise, and developing eBusiness

capabilities in the context of a strategy rather than as a stand-alone activity.

When respondents were asked to give specific examples of how their company has benefited from eBusiness, the wide range of responses indicated how flexible eBusiness technologies are in adapting to the diverse needs of companies (Table 2). These responses are not hypothetical, but rather indicate how forest products companies are currently taking advantage of eBusiness opportunities including market segmentation, promotion, distribution, pricing, information management, and improving customer satisfaction. The significance of how eBusiness can positively change a company's way of doing business cannot be understated.

## CONCLUSION

Companies seek products, processes, and technologies that add value to their offerings in an effort to become, or remain, competitive in the marketplace. Firms that consistently deliver superior benefits are highly valued by business partners. This also helps to establish, develop, and maintain strong relationships (18). eBusiness is one means for developing such a competitive advantage. The emergence of cyberspace as a significant place to do business is a fundamental shaping force that will transform business and society. Internet-based technologies offer revolutionary tools for business development and management. The Web, the primary vehicle for Internet access, can provide forest products companies with a powerful promotional tool, and there is also great potential to use the Internet to facilitate sales and purchases.

As technology becomes more accepted and costs decline, eBusiness will become a common business practice (3). Already it is estimated that nearly 100 percent of Fortune 1,000 companies are currently involved in using Internet-based business systems or are developing them (19). As our survey indicated, 40 percent of responding forest products companies are conducting some type of eBusiness. Following the lead of corporate America in general, it is expected that the forest products industry will expand its use of eBusiness technologies to increase productivity, efficiency, and competitiveness.

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