Internet Adoption by Primary Wood Products Manufacturers in the Western United States

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Abstract

Use of the Internet as a platform to do business in the forest products industry is well established. Companies can use the Internet to purchase from suppliers and sell products to customers. This study examines current and potential use of Internet-based technologies to conduct business by solid wood products manufacturers in the Western United States. Sixty-one percent of respondents have a web site. Web site development is a fairly recent phenomenon with 65 percent of respondents developing their sites in the past 2 years. Larger companies were found to have developed web sites earlier than small companies and to have spent more money on web site development. Perceived Internet benefits are all competitiveness, cost reduction or customer related. Respondents do not seem to believe that the Internet can create customer value or improve their competitive position. Only 18 percent use the Internet to sell products, which is currently being conducted primarily using email and 10 percent said that they would be willing to use a third-party marketplace exchange to sell products on the Internet.

Introduction

The Internet represents the most important technological development of our generation (Anonymous 2000), offering considerable potential as a business tool. In addition to being an internal information-sharing platform, companies can use the Internet to identify and secure potential customers, support market development efforts, and conduct transactions.

Overall, the Internet allows for mass customization, building of stronger business relationships, a greater degree of channel coordination, heightened communication with various publics, and enhanced customer service (Punches 1998).

Internet-based business has generated a number of approaches to creating models that influence business practices. Some models are process-oriented, while others are technology-based. What is important is the underlying strategic business application that is necessary to develop effective strategies to compete in today's environment. Thus, before implementing this new technology, there is the need for management to address the strategic scope of the organization and how it fits with technology (Griffith and Palmer 1999).

The Internet substantially narrows language and geographic gap in conducting business. It reduces communication cost, documentation, and costs associated with time-zone differences. Any cost-saving activity will have an impact on competitiveness through increased profitability and lower cost of moving product to market.

The Internet has also created a new vehicle for organizations to access global markets. In the international realm, Nicovich and Cornwell (1998) reported that the Internet could bridge the gap between cultures, thereby lowering traditional barriers to communication imposed by different languages and special distances.

As more people get connected everyday to conduct such activities as education, business transactions, personal correspondence, research, and information-gathering, the Internet is becoming an increasingly vital tool in society.

The primary wood products industry and the Internet

Solid wood (as opposed to pulp and paper products) forest products can be broadly characterized as primary or secondary products. This classification is not always clear, but most industry observers agree on general definitions of the groups. Primary products are those that are produced directly from raw timber input. Examples include chips, lumber, veneer, plywood, and their by-products. Secondary products use primary products as input for remanufacturing. Examples include various types of panels, engineered composites, or dimension stock. Secondary products can also include final consumer products such as furniture (Vlosky and Chance 2000). This study focuses on the primary sector of the industry.

Historically, target markets for the primary wood products industry in the United States have been homebuilders, repair and remodeling contractors, secondary products manufacturers, and home centers (Sinclair 1992). The products that have been geared to these markets have been generally commodities.

However, there is an emerging drive towards fulfilling the diverse needs of customers through differentiation of products based on service level, quality of product service, distribution methods, and credit. This is done in order to avoid direct pricing competition, and the Internet provides one sure solution (Sinclair 1992).

It is predicted that by 2005, "…. the Internet will affect the wood industry more than any computer controlled device in the business. Customers and suppliers could be brought together (in real time) in the market space. The Internet will schedule production and troubleshoot problems. It will be a source for employment and a means to compensate pay and coordinate benefits. All activities will be documented and services for payment for products and services will be rendered. A new level of customer service, communication, and potential user satisfaction will be possible and woodworkers who embrace the Internet will grow in the new millennium" (O'Brien and Cutter 1999).

Howard Feldman, president of Feldman Engineering Corporation reported that e-commerce will play a vital role in the supply chain management of the forest products industry. The main purpose will be to provide information over the Internet to customers in order for them to educate themselves before purchase (Iwanski 1999).

In summary, the Internet is seen as technology that will impact all levels of the forest products industry. It is predicted that firms that will change their administrative, marketing, and manufacturing organizations to grasp the advantages offered by this technology will succeed (Checchi, 1999).

The Study

Research Context

This study examines current and potential use of Internet-based technologies to conduct business by solid wood products manufacturers in the Western United States. Internet-based technologies were studied in the context of implementation strategies across a number of product types including lumber, plywood, particleboard, etc. A census of 225 companies was surveyed. The sample frame was selected from the Random Lengths Big Book, 1999 Edition.

Respondents were asked to discuss their current or planned Internet strategies with particular emphasis on perceived opportunities and concerns regarding Internet-facilitated marketplace exchanges.

Objectives

1. Examine the current and potential uses of the Internet in the solid wood products industry in the Western United States.
2. Discern the general readiness of the industry to do business through Internet based technology.
3. Identify criteria for participation in Internet-facilitated market exchanges.
4. Identify concerns with regard to participation in Internet-facilitated business practices.

Research Methodology

Data Collection

Mail questionnaires were used because they are a cost-effective method of data collection for examining industry structures and business applications. The method affords a high degree of anonymity and is less limited by rigid time constraints that can impede the effectiveness of other survey methods.

Based on client-determined parameters, a list of topics and questions was generated. The questionnaire instrument tested constructs using measures developed by the researcher and adapted from other sources. The survey was reviewed and revised by the researcher and client. An iterative process resulted in the final instrument.

The questionnaire consists of fixed response questions, including fixed alternative and multichotomous questions for responding firm demographic profiles as well as open-ended questions, which allow respondents to express thoughts and ideas not covered in the fixed format questions. Five-point scaling questions, anchored by 1 = strongly agree to 5 = strongly disagree and by 1 = very important to 5 = very unimportant, were employed to measure respondent levels of agreement and concern with various questions addressing Internet issues and implementation.

The questionnaires were mailed to companies selected by the researcher from the Random Lengths Big Book, 1999 Edition. Pre-addressed, postage-paid envelopes, and a signed cover letter were included with the questionnaire. The cover letter also promised summary results of the study for completing and returning the questionnaire, a tactic that has been used successfully by the researcher in many previous studies. Pre-notification and reminder postcards were also sent to targeted companies. The study results are based on two mailings. All surveys were sent to upper-level marketing or management individuals by name and title in each company.

Results

Response rate and respondent demographics

Table 1 shows the number of respondents initially sampled, the adjusted sample size after accounting for non-deliverable surveys (due to company closures, change of address or deceased), and adjusted response rate. All industry survey respondents were surveyed at the corporate headquarters level. Given that typical response rates for industrial studies range from 15 percent-30 percent, a response rate of 23 percent in this study is considered to be good. The majority of the population and responses are from Oregon (**Table 2**) with 40 percent and 57 percent, respectively. The overall response profile across all states generally follows the population distribution.

Table 1. Overall Response Rate

Initial Sample Size	Inappropriate or Undeliverable	Number of Total Respondent Companies	Adjusted Response Rate
225	10	49	23 percent (49/215)

Table 2. Response Rate by State

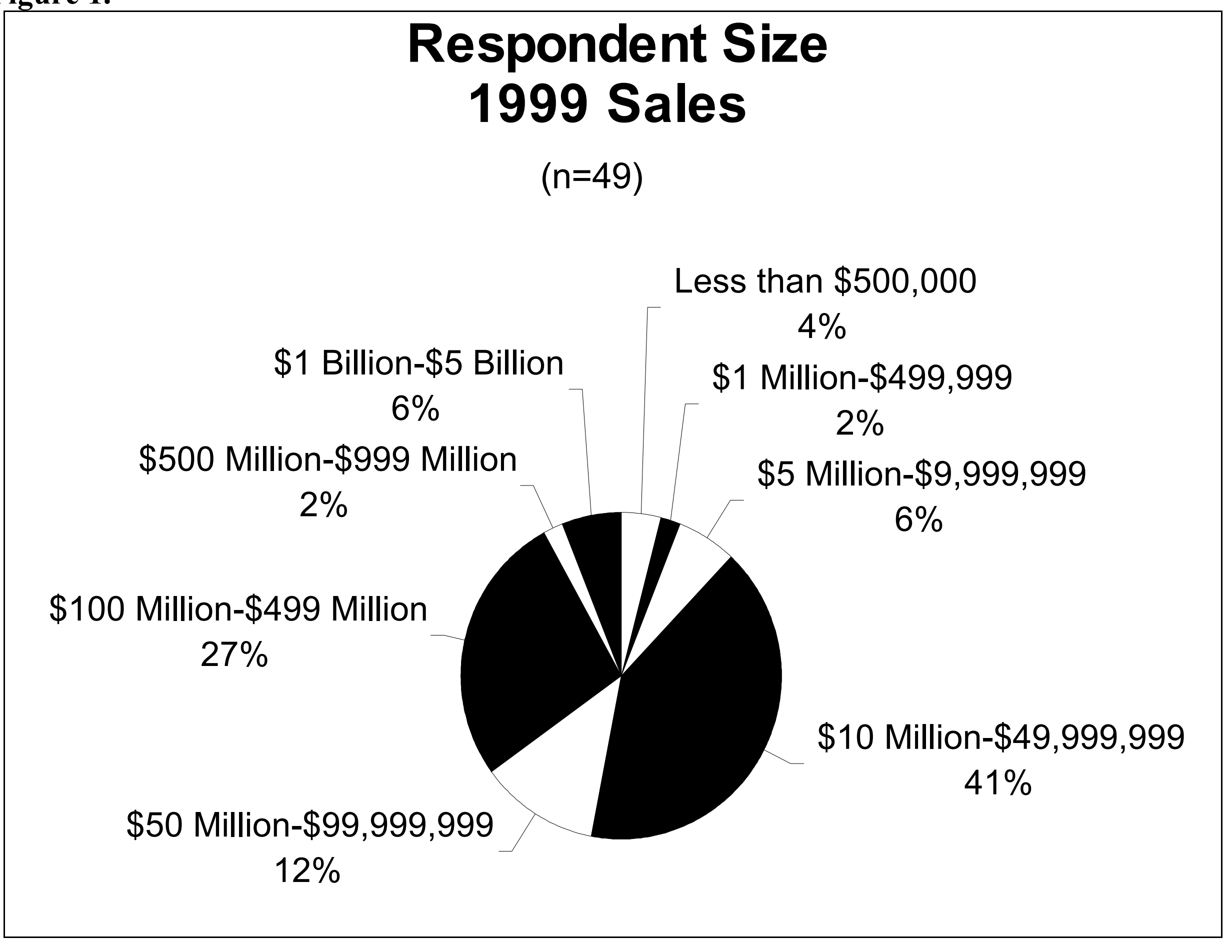
	Response Frequency	Percent of Total Responses	Percent of Total Population	Response Rate
CA	11	22 percent	19 percent	26 percent
MT	3	6 percent	9 percent	16 percent
ID	0	0 percent	9 percent	0 percent
OR	28	57 percent	40 percent	31 percent
WA	7	14 percent	23 percent	14 percent
Total	**49**	**100 percent**	**100 percent**	**23 percent**

Geographic Distribution of Study Respondents

Respondent were surveyed at their corporate locations. Fifty-seven percent of respondents are located in Oregon, followed by California (22 percent), Washington (14 percent), and Montana (6 percent). No responses were received from Idaho, although it represents 9 percent of the study population.

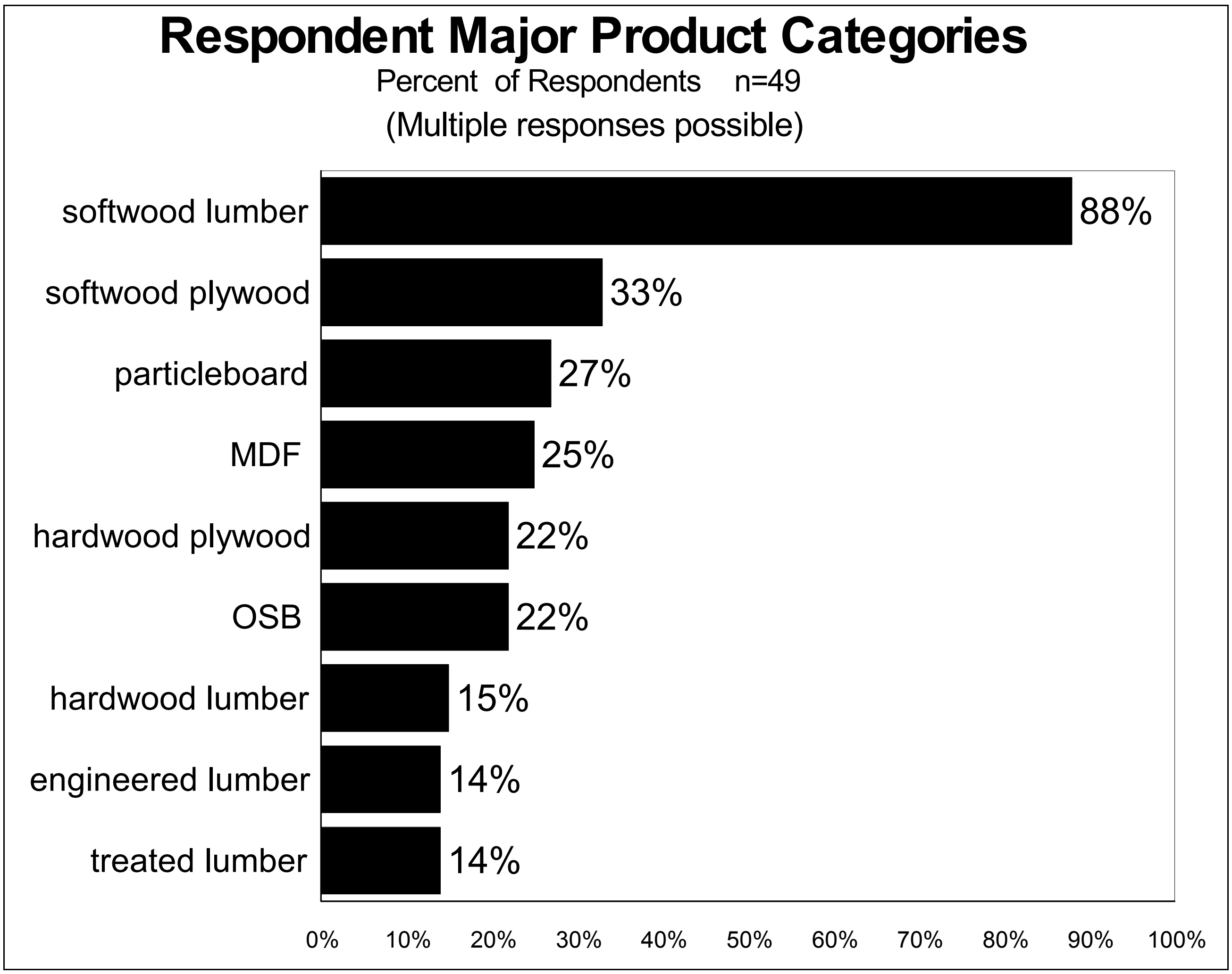
The majority of respondent companies are small, with over 50 percent having sales of \$50,000 or less. Eight percent of respondents had sales over \$500 million in 1999 (**Figure 1**).

Figure 1.



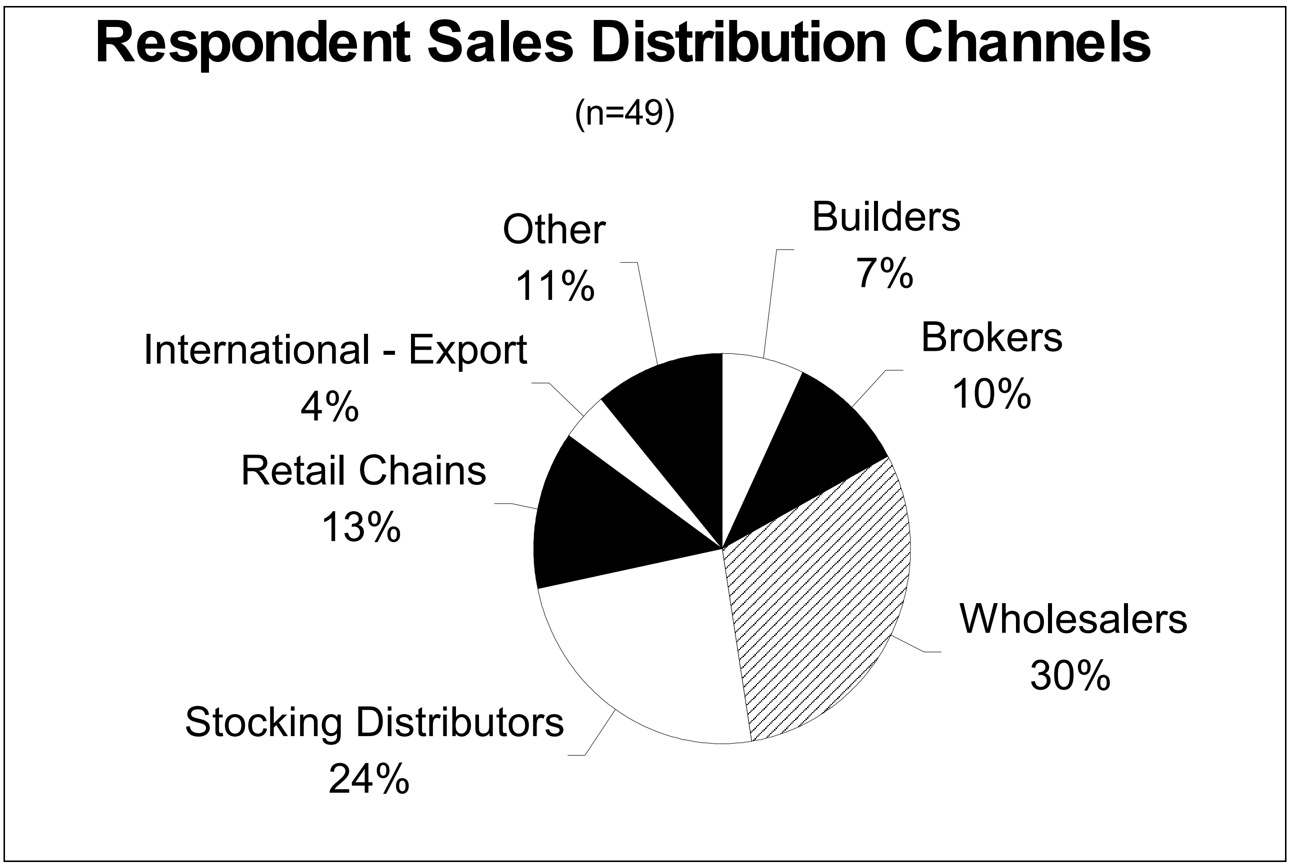
Respondents produce a variety of products (**Figure 2**). Softwood lumber is by far the most represented product being produced by 88 percent of respondents followed by softwood plywood (33 percent of respondents). The next grouping of products includes particleboard, MDF, hardwood plywood and OSB. The final grouping includes hardwood lumber, engineered lumber (including LVL and glulam), and treated lumber.

Figure 2.



Respondents sell the majority of their production through some form of distribution intermediary **(Figure 3**). Thirty percent is sold through wholesalers, 24 percent through stocking distributors, and 10 percent through brokers. The balance is sold direct either to retail chains (13 percent), builders (7 percent), or export (4 percent). Eleven percent is sold to other channels, primarily to OEM and mill sale customers. Nearly two-thirds of respondent sales are shipped by truck with 31 percent and 4 percent shipped by rail and ship, respectively.

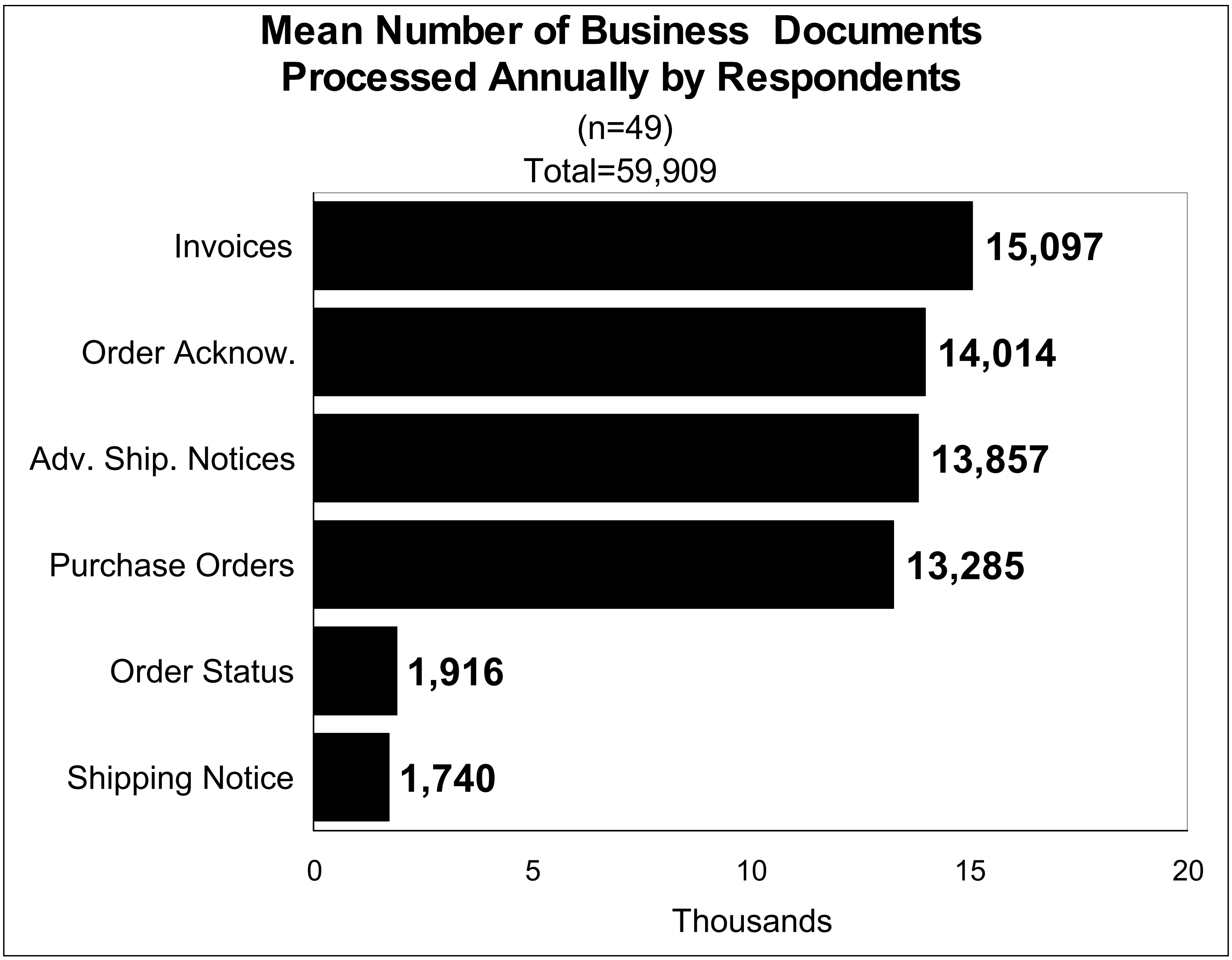
Figure 3.



Business document transmission and receipt

Because eBusiness often facilitates the electronic transmission of business documents, it was important to discern the types and frequency of documents respondents send and receive. Respondents indicated that they send or receive approximately 60,000 business documents annually (**Figure 4**). Invoices, order acknowledgement, advance shipping notices, and purchase orders account for 94 percent of the total.

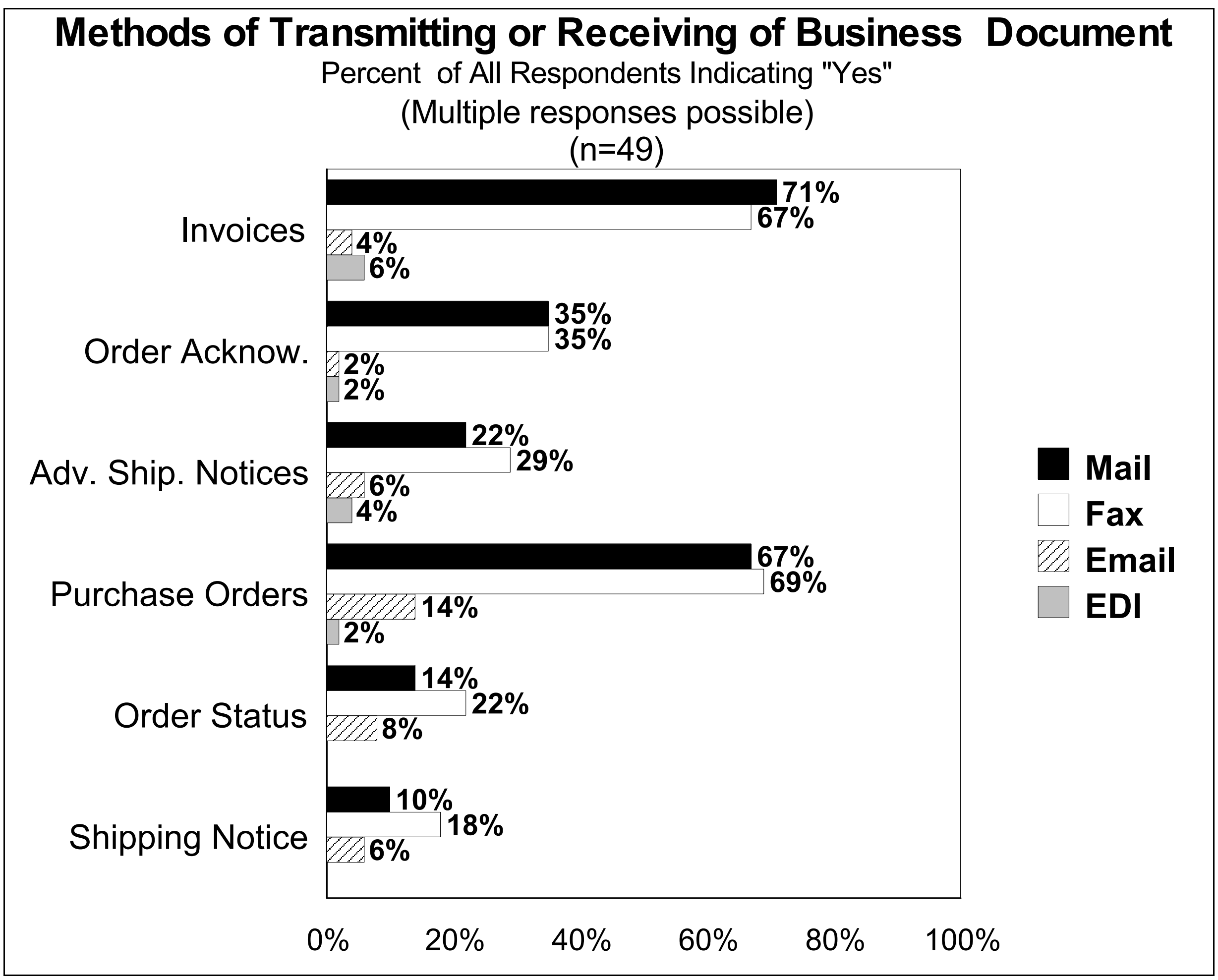
Figure 4.



Telephone and fax are by far the preferred method for respondent companies to transmit or receive business documents (**Figure 5**). This is especially apparent for invoices and purchase orders. A distant third is email followed by Electronic Data Interchange (EDI). EDI is computer-to-computer electronic transmission of business documents between business trading partners. The documents are in structured formats that can be processed by both party's computer application software.

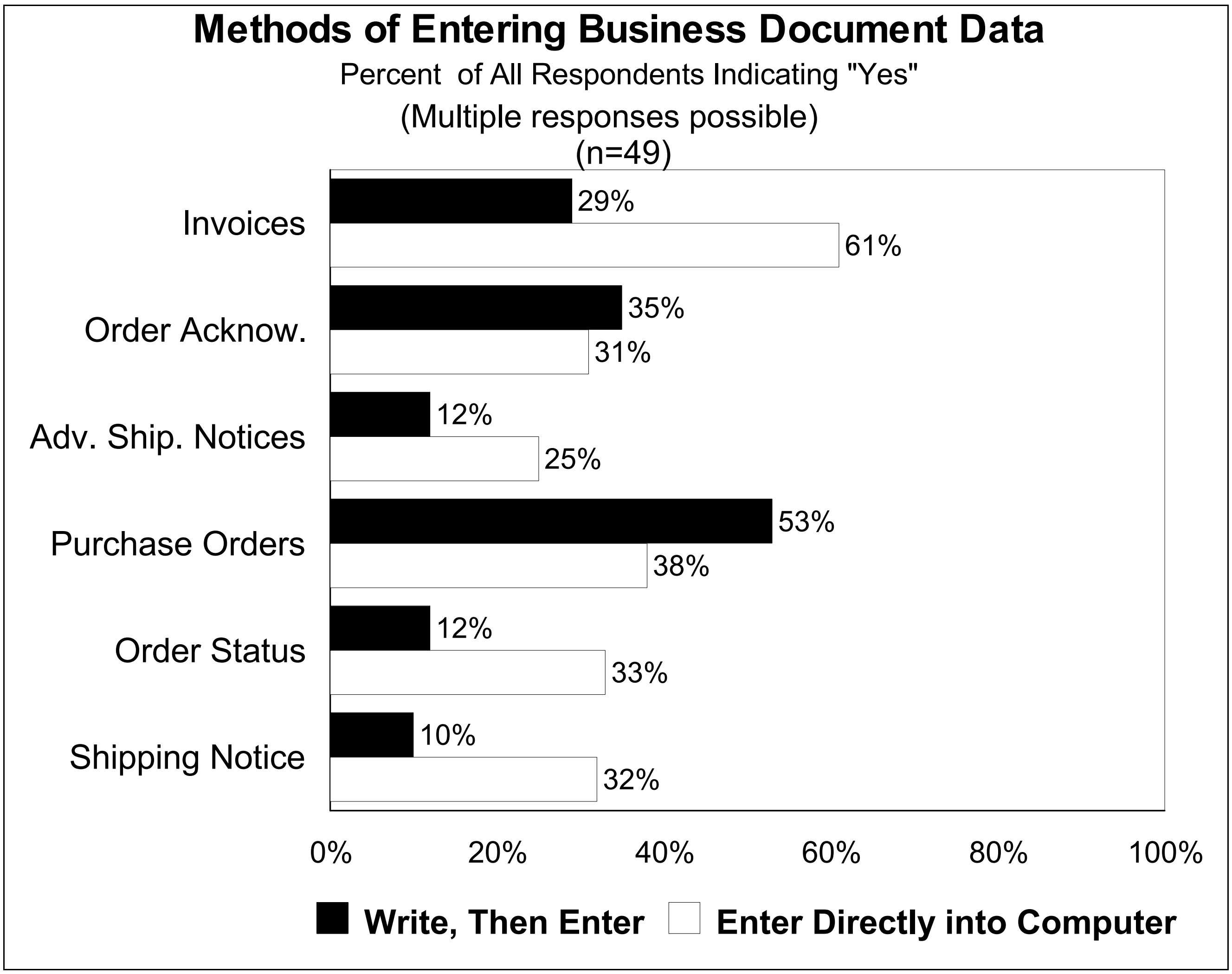
This finding has implications for convincing potential clients to transition to an electronic means of process application information entry.

Figure 5.



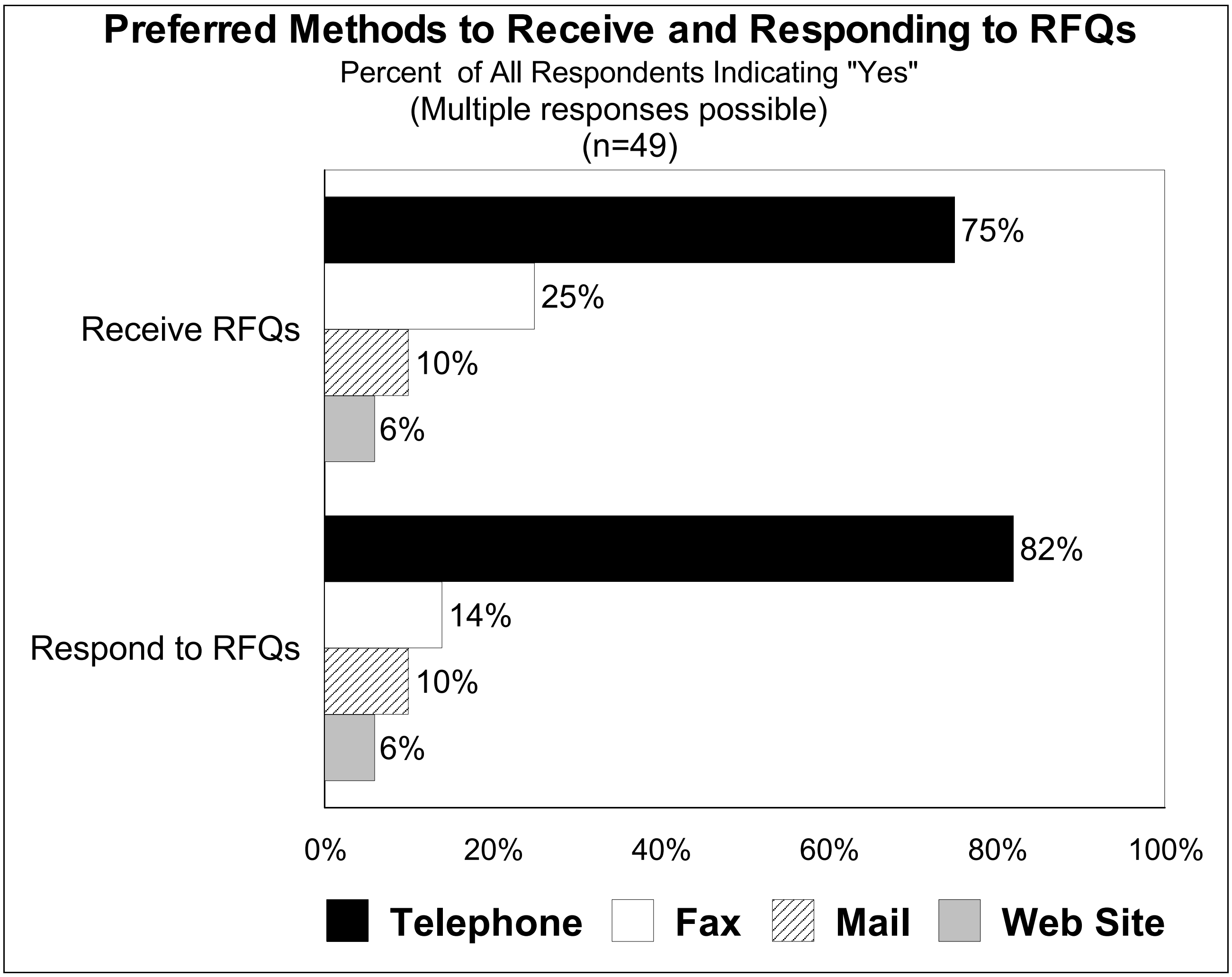
There is evidence of computer usage in business applications in that a number of respondents enter information directly into a computer as opposed to writing it down first and then keying in the data. Sixty-one percent of respondents enter invoices directly while this figure is 38 percent, 32 percent, and 31 percent for purchase orders, shipping notices, and order acknowledgements, respectively (**Figure 6**).

Figure 6.



An integral component of any e-based market exchange is facilitating the receipt of and responses to requests for quotes (RFQ). By a wide margin, respondents prefer to both receive and respond to RFQs by telephone (**Figure 7**). Faxing is a distant second followed by mail. Only 6 percent of respondents use their web site for this purpose, probably through email.

Figure 7.



Perceptions of the Internet for Doing Business

Whether or not respondents currently use the Internet to conduct business, it was important to understand what they feel are (current or potential) Internet benefits. This information can be used to tailor offerings to prospective clients. As seen in **Figure 8**, respondents perceive the greatest benefits to be in the areas of image, exposure to potential customers, and information. Benefits such as lowering costs, eliminating inefficient phone tag, and providing customer value were ranked low, just barely above 3.0 (neutral).

Figure 9 highlights these perceptions by showing the conditions ranked below 3.0 or neutral. These are all competitiveness, cost reduction, or customer related. Respondents do not seem ready to embrace the Internet for creating customer value or improving their competitive position.

Although ranked low, the perception that using the Internet can lower the costs of doing business is positively (and statistically significantly) correlated to respondent company size.

Figure 8.

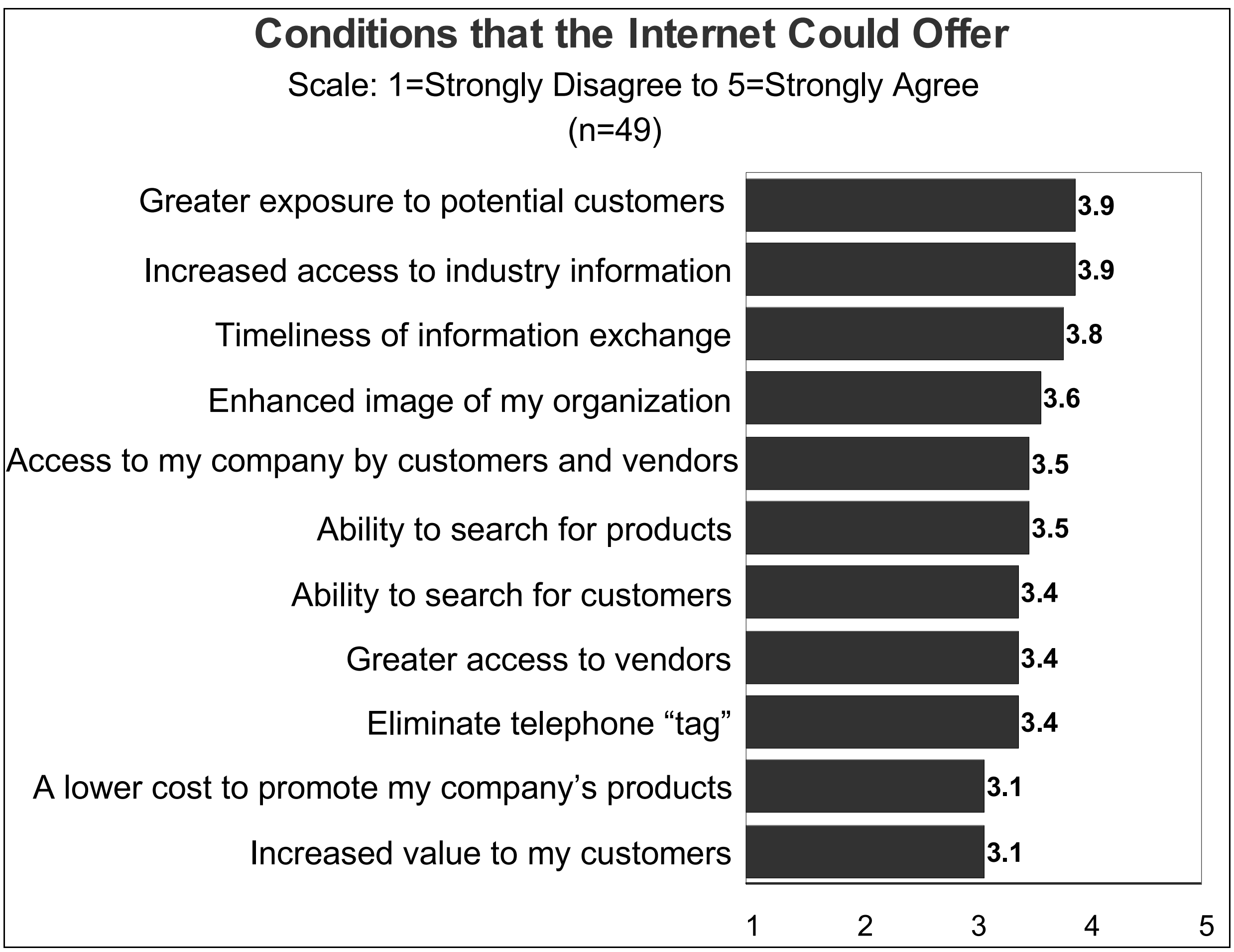
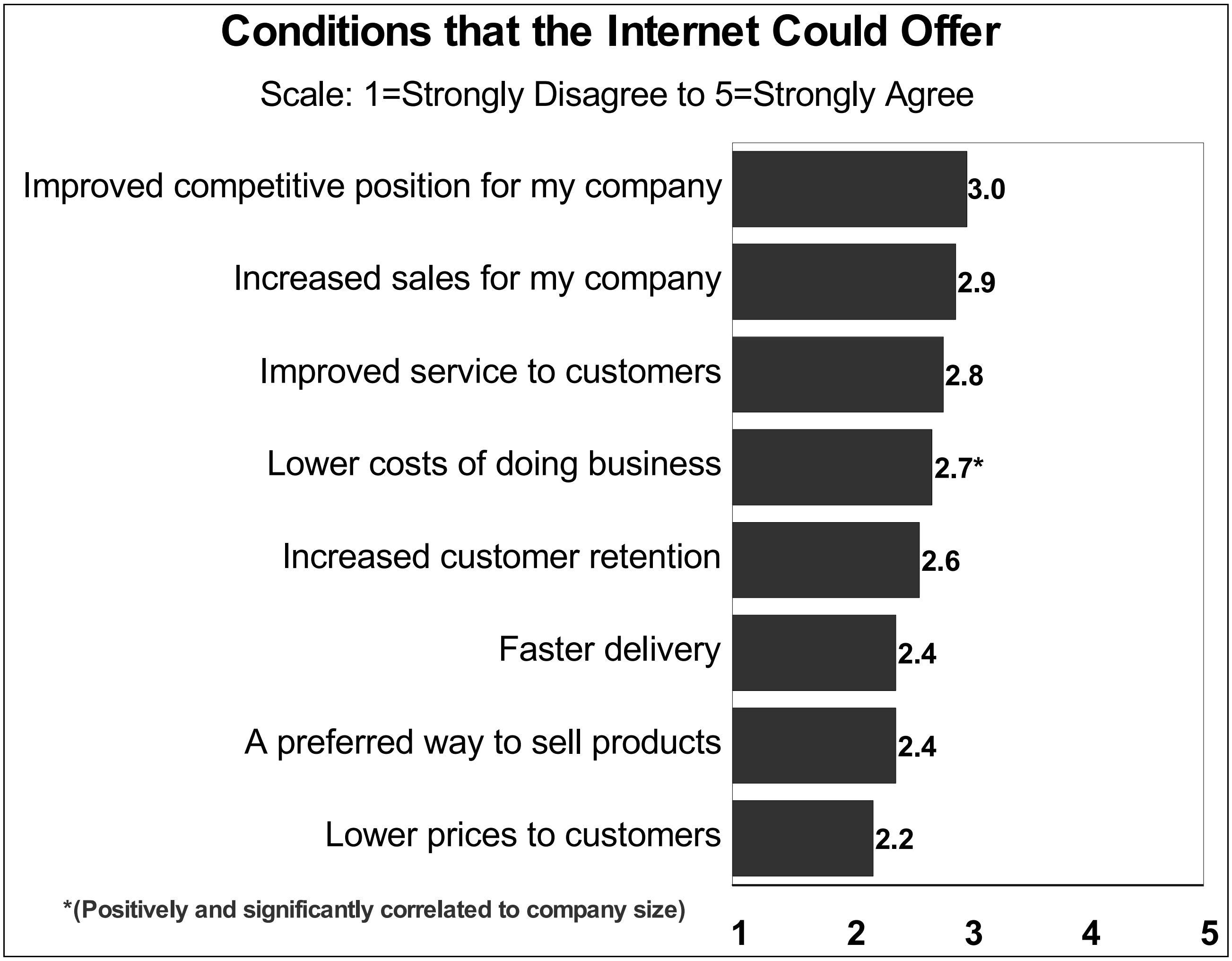


Figure 9.



<u>Third-Party Exchanges</u>

There are many third parties that serve to facilitate the exchange of goods and services between the forest products manufacturers, their suppliers, and their customers. This often alters buyer/seller relationships, as they currently exist in traditional non-Internet marketplaces. Third-party exchanges (TPE) create a market space where buyers and sellers can transact business. TPEs purport lower transaction costs, shortened cycle-time, and increased value-chain efficiency. However, this does not come without concerns, which include the perception of limited functionality and the potential requirement for many Internet-interfaces each manufacturer must develop in order to manage multiple marketplaces, security issues, and privacy matters (Piszczalski 2001).

Ten percent of respondents are very willing to sell products through a TPE (**Figure 10**). Although not statistically significant, there is a positive correlation between willingness to use a TPE and respondent company size. Eighteen percent of respondents are somewhat willing to sell using TPEs and 33 percent are indifferent. The implication is that 61 percent of respondents are potential TPE clients.

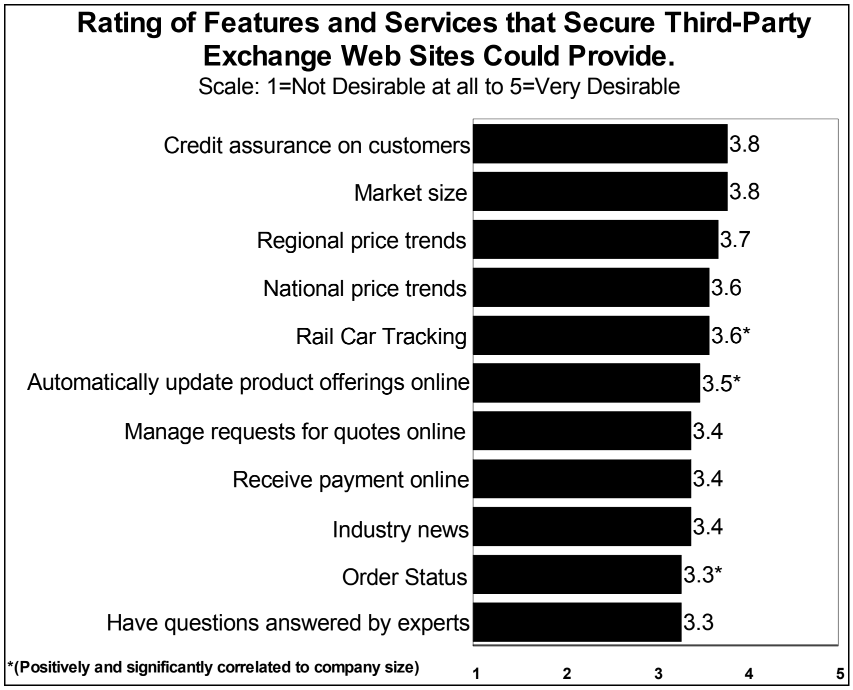
The most extreme example of using the Internet for conducting business is the linkage to a company's back office applications. Four percent of respondents indicated that they were very willing to let a TPE link to their back office systems. An additional 16 percent are somewhat willing and 20 percent are indifferent. Over 50 percent of respondents are either somewhat or very unwilling to go to this level of eBusiness. Willingness to let TPEs link back office systems is significantly and positively correlated to company size.

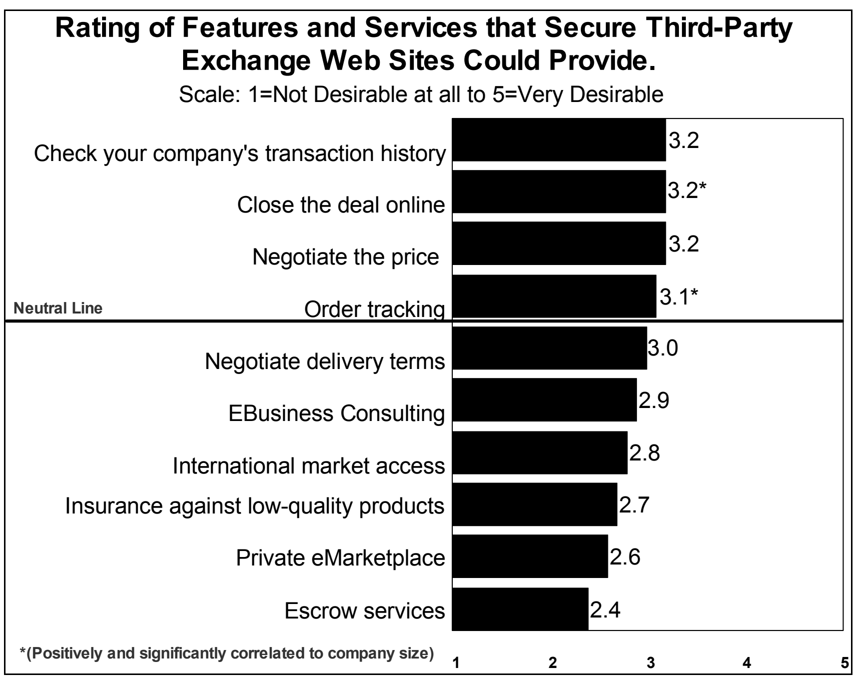
One of the most important batteries of questions in the study deals with TPE features and services that respondents find desirable. On a scale of 1=not desirable at all to 5=very desirable, the highest ranking features, customer credit assurance and market size information, had a score of only 3.8 (**Figure 11**). Price trends, both regional and national were ranked next, followed by online rail car tracking.

Next ranked, in order, was the ability to update product offerings, manage RFQs, receive payment on line (electronic funds transfer), and receive industry news. Features ranked below 3.0 (neutral), included delivery negotiating, eBusiness consulting, international market access, assurances against low-quality products, a private market place, and last, escrow services.

Rail car tracking, closing deals online, and order tracking were statistically and positively correlated to respondent company size.

Figure 11.



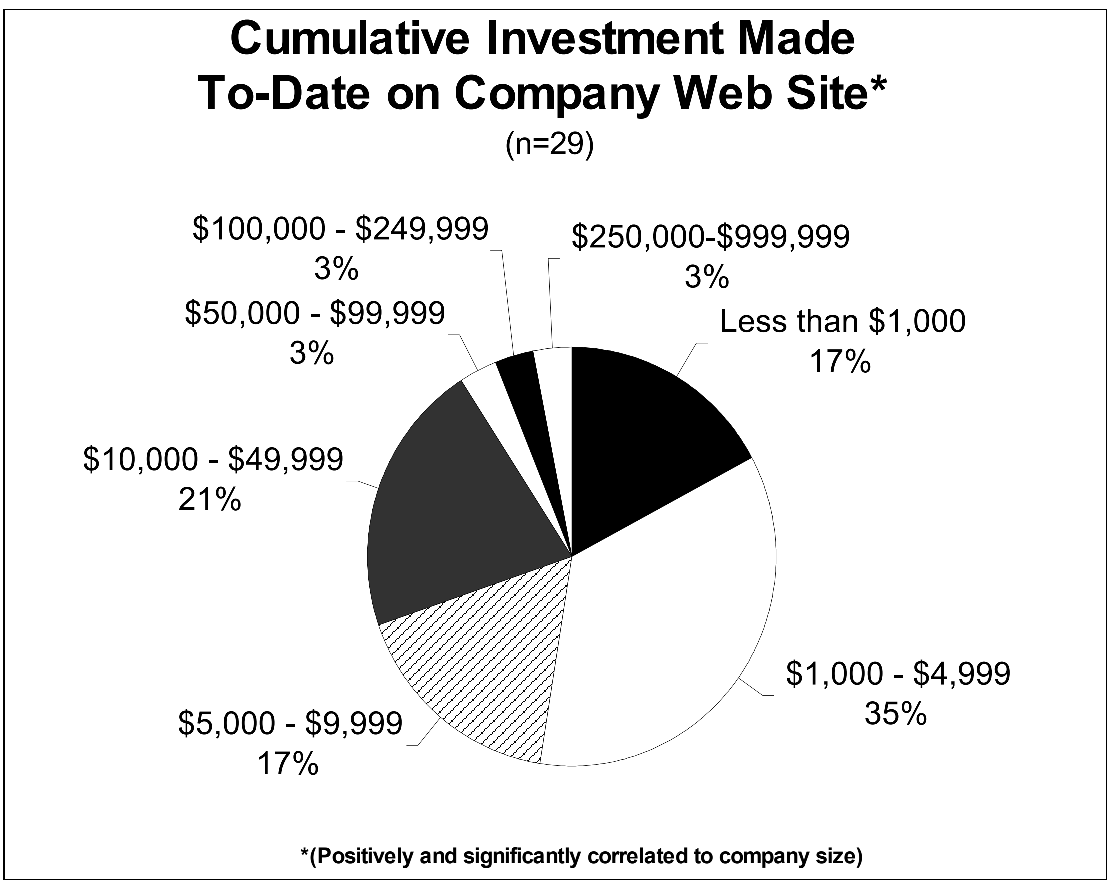


Respondent web sites

61 percent of respondents have a web site and 100 percent of these companies have registered web domain names. Web site development is a fairly recent phenomenon with 65 percent of respondents developing their sites in the past 2 years. Larger companies were found to have developed web sites earlier than small companies.

Larger, more complex companies have invested more than small companies to develop and maintain their web sites (**Figure 12**). Over half of respondents with web sites spent less than $5,000 to date while 6 percent of respondents spent $100,000 or more. Only 14 percent of respondents believe they paid an excessive amount for their web sites with over a third saying that what they spent was a very good value.

Figure 12.



Respondent web site functionality is rudimentary at this time. Promotion/Advertising is the only significant web-site function (93 percent of respondents). Customer service followed at 7 percent of respondents, and operational functions at 3 percent. Convincing wood products companies to go beyond using the Internet as an electronic advertisement is a challenge. Although 61 percent of respondents have a web site, not one said they were using their web site for eCommerce. Only 18 percent use the Internet to sell products, which is currently being conducted using email.

Web-site establishment is nearly evenly split between in-house and outside company at 57 percent and 43 percent of respondents, respectively. Similarly, 53 percent of respondents said that they maintain their web site in-house while 47 percent rely on an outside company. This indicates opportunities for independent web developers to service the respondent industry base. Fifty percent of respondents plan to develop or improve their web site in the next 12 months.

Conclusion

This study indicates that there are significant potential opportunities as well as challenges to providing third-party exchange services to forest products companies. On one hand, 61 percent of respondents have a web page. This is good. On the other hand only 18 percent are using the Internet to sell products and this is primarily just using email. No respondents are actually doing eCommerce. The threat of security breaches has abated from previous studies conducted in the forest products industry. The greatest concerns are loss of personal contact and relationships with customers as well as the fear that eBusiness will drive prices down and create a cutthroat business environment.

To be able to effectively conduct business on the Internet, forest products industry members must ascertain if costs could be reduced and service levels increased by establishing an

Internet channel. Another question is whether it will be a competitive disadvantage if competitors provide eBusiness capabilities to customers first.

In summary, the driving forces behind digitalization are so powerful that they will inevitably challenge almost all aspects of business. To be successful, the primary wood products industry will have to marshal its competences to integrate its business effectively into Internet-based information networks and respond rapidly to changing customer perceptions of value.

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