



United States Paper Buyer & Supplier Perceptions of Using eIntermediaries

Sanna M. Kallioranta¹
Richard P. Vlosky²

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Louisiana Forest Products Development Center
School of Renewable Natural Resources
Louisiana State University Agricultural Center

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¹ PhD Candidate, Forest Products Marketing Program, skall1@lsu.edu

² Director & Professor, Louisiana Forest Products Development Center, rvlosky@agcenter.lsu.edu

Abstract

eIntermediaries (also called eMarketplaces) were established in the 1990's with the promise of streamlining supply chains, help increase efficiency, minimize negative effects of economic cyclicality, and to improve industry profitability. The use of eIntermediaries in the pulp and paper sector has been low, leading to failure of many paper vertical start-up companies when the economy softened and the dot.com bubble burst in 2002. This article explores U.S. paper supplier and buyer perceptions of eIntermediaries. Results of a survey conducted in 2003 indicate that attitudes and expectations regarding eIntermediaries do not differ dramatically between paper buyers and suppliers. Both are concerned that using eIntermediaries could lead to loss of contact with exchange partners. Overall, suppliers had more concerns about using eIntermediaries. Overall, the most serious concerns were with profitability, security of sensitive information, having the necessary company resources and the perceived need to restructure established business processes.

Using the Internet to conduct business (eBusiness) can pose daunting challenges for companies in managing exchange relationships and internal operations. In 2000, there were more than 50 dot.coms (Internet-based intermediaries, or eIntermediaries) competing for a share of the \$244 billion paper industry. Because the marketplace did not embrace the eIntermediary offering, most of these companies failed. In this paper we examine perceptions of eIntermediaries from the U.S. paper buyer/supplier dyad perspective. The research findings can help paper exchange partners and other supply chain members to better understand concerns and opportunities in using eIntermediaries in the pulp and paper industry sector.

INTRODUCTION

The global paper industry has faced several challenges over the past decade including large scale industry consolidation, globalization, overcapacity, high inventories, variable lead times, and fluctuating demand and profitability (Juslin and Hansen, 2002). Since the late 1990's, several information and communication technologies have been developed to help solve these problems and generally reduce inefficiencies in paper supply chains.

eIntermediaries promised streamlined supply chain, reduced costs, and increased revenues. They also promised improved information flow in the marketing channel; improved collaboration between exchange partners; easier business information system integration; reduced inventory levels; improved market reach; reduced transaction cost (e.g. identifying new suppliers and customers, negotiations etc.); lower multiple supplier purchasing costs; aggregated purchasing power; visibility to consolidated pricing information; customized pricing; real-time industry news dissemination; reduction of low value-added traditional distributors, merchants, and brokers (i.e. off-line disintermediation) (e.g. Mahadevan, 2003; Ranganathan, 2003). In addition, Grewal, et al., (2001) suggest that there are legitimacy motives for electronic market participation such as projecting a positive and technology advanced image and mimicking benchmark organizations.

But, in spite of these promises, most eIntermediaries failed in the dot.com bust in the late 1990's. Why? In this paper, we share the results of a study conducted in 2003 that examined eIntermediaries in the paper industry, an important U.S. industrial sector.

Marketing channels and eIntermediaries

A marketing channel is "a set of interdependent organizations involved in the process of making a product or service available for use or consumption" (Kotler, 2000). Marketing channel decisions are directly linked to other corporate marketing decisions such as pricing, promotion, product decisions; physical distribution; risk management (e.g. uncertainty and credit); and production (Stern and El-Ansary, 1992; Kotler, 2000). Traditional (off-line), marketing channel intermediaries include wholesalers, brokers, agents and distributors while electronic (on-line) intermediaries include eExchanges, eMarketplaces, eAuctions and other Internet-based transaction facilitators and market information providers. A marketing channel structure, i.e. the set of institutions, agencies, and establishment through which the product must move (Stern and El-Ansary, 1992), can be very complex, have many levels, and combine both traditional and electronic intermediaries. A channel member performs one or more functions including physical possession, ownership, promotion, negotiation, financing, risking, ordering, payment, and information (Stern and El-Ansary, 1992). A primary premise in marketing channel management is that you can eliminate an intermediary but you can not eliminate its functions.

Conflicts in marketing channels may rise from incompatible goals, unclear roles, power asymmetry, or opportunistic behavior. Such tension, in concert with the emergence of the Internet and eBusiness, has created opportunities for eIntermediaries to step in and attempt to gain a market toehold by providing supply chain efficiencies and competitive advantages for their clients (i.e. buyers and suppliers). Some eIntermediaries attempted to position themselves as a part of the existing marketing channel structure; e.g. between a manufacturer and a merchant, while others attempted to replace traditional channel members, i.e. disintermediation. Both strategies caused concern and uncertainty about future channel structures and roles in paper supply chains.

When companies consider participating in Internet-facilitated on-line supply channels, the first decision often is whether to establish a direct exchange partner link or use an eIntermediary (**Figure 1**). Direct channels are typically referred as private exchanges, which can be either buyer or seller driven and utilize quasi-market mechanisms (Ranganathan, 2003; Mahadevan, 2003).

There are two general Internet market intermediary organizational structures. Independent exchanges are typically funded by venture capital or private investors, consortia exchanges rely on industry consortia ownership arrangements. There are also two basic linkage structures, vertical marketplaces that operate inside an industry boundary, e.g. trading only pulp and paper products, and horizontal marketplaces which operate across multiple industries offering common applications/solutions e.g. logistics services.

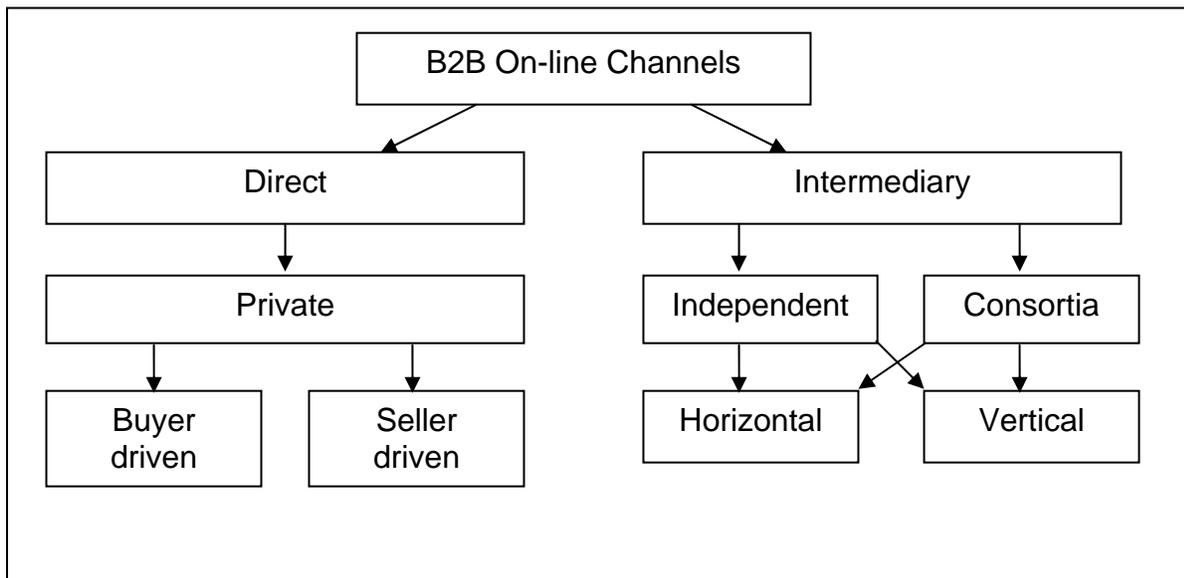


Figure 1. Business-to-Business on-line channels (modified from Ranganathan, 2003)

eIntermediaries have a multitude of business models, i.e. means to generate revenue. According to Afuah and Tucci (2003), the dominant eBusiness eIntermediary models generate (or try to generate) revenue through advertising, sales commissions, markups for value-added services, production volumes transacted, referrals, subscriptions, and other fee-for-service scenarios. These various eIntermediary business model taxonomies include terms such eMarketplace, eExchange, eShop, eAuction, collaboration platform, virtual community, catalog aggregator, value-chain integrator, information broker etc. Currently, many of the business-to-business (B2B) eIntermediaries have evolved from a single business model to include a combination of market structures with the goal of creating multiple revenue streams (Mahadevan, 2003).

In the context of our research, the term eIntermediary includes: providers of on-line paper product buying and selling services, including auctions; providers of on-line paper-industry-specific information, i.e. eInformediaries; providers of inter-organizational information system integration through Internet infrastructure for the purpose of sharing vital business information and execute transactions, i.e. value chain integrators (Mahadevan, 2003). These eIntermediaries can be owned by either a paper industry consortium or an independent third-party entity.

eIntermediaries and the pulp and paper industry

Timmers (1999) in Hayes and Finnegan (2003) propose that lack of understanding appropriate business models, concerns about cost, security, legal issues, and technology are the main impediments with eBusiness in general. Improved price comparison capabilities and following price focus, poor site usability, lack of back-end integration, and security both in terms of computer viruses and confidentiality are also prominent concerns with eIntermediary implementation (Day et al., 2003). Porter (2001) argues that the Internet tends to alter industry structures in ways that dampen overall profitability. He claims that Internet channels bolster buyer bargaining power, reduce barriers to entry, increase and intensify rivalry, lower switching costs, and thus hinder companies' capability to sustain competitive advantage.

According to the U.S. Census Bureau (2004), eCommerce transactions in the (total) manufacturing sector were \$752 billion in year 2002. The pulp and paper industry ranked 11th among the 20 manufacturing sectors reported with total eCommerce transaction value of \$18 billion.

PricewaterhouseCoopers concluded that the five most serious challenges to pulp and paper industry companies implementing eBusiness are integrating legacy systems, managing change in business culture to allow partnering with suppliers and customers, hiring and retaining quality employees, establishing business processes and industry standards, and having a well-developed eBusiness strategy emphasizing eBusiness as a business strategy (Cubine and Smith, 2001; pponline.com, 2000).

The pulp and paper industry has seen the emergence and fall of eIntermediaries. Independent marketplaces struggled in gaining adoption and market trust and, as a result, after initial enthusiasm waned, there was the demise of pulp and paper vertical dot.coms such as PaperExchange, PaperX, Clickpaper, FobPaper, and Fibermarket.

The next wave consisted of consortium eMarketplaces. Brick-and-mortar companies reacted to the possibility that these new independent entrants might control trade across an industry and began to announce their participation in industry consortiums (Day et al., 2003; Aclly, 2000). Although only 8 percent of the total number of exchanges in 2001 were consortia driven (Day et al., 2003), this second wave sent out a clear message that brick-and-mortar companies wanted to take "the e-(r)evolution" into their own hands. Consortiums had a clear advantage in driving adoption compared to independent exchanges. The advantages of consortia exchanges include access to transaction volume, financial strength, industry knowledge, and ability to develop standards (Day et al., 2003; Ranganathan, 2003). However, even the industry consortiums struggled to gain adoption, especially under the marketplace model, thus shifting focus to supply chain collaboration and integration.

For example, in 2001, North American forest industry giants Boise Cascade, Georgia-Pacific, International Paper, Mead Westvaco, and Weyerhaeuser jointly established ForestExpress (ForestExpress, 2002). In 2004, ForestExpress changed its name to Liaison after overhauling its initial eMarketplace business model to become a value chain integrator and extending its scope to other industries beyond the forest sector.

At the same time, in Europe, paper manufacturers International Paper Europe, Lecta Group, M-Real, UPM-Kymmene, Sappi Europe, Soprocel, and StoraEnso- and merchants Antalis, Buhrman, and Map established Espresso to service European fine paper and publication markets (Espresso, 2003).

The third wave, where businesses are reacting to the limitations imposed by the second wave, is well on its way. Businesses are taking back the control of sales and customer

relationships by developing their own private exchanges and extranet solutions, where they do not have to worry about competitive or antitrust limitations present in the consortia model (Acly, 2001). However, cost of launching and running a private exchange can be much higher than participating in a consortia or third party exchange (Ranganathan, 2003). eIntermediaries are also participating in the Third Wave by providing virtual private connectivity for exchange partners.

THE STUDY

The objective of this study was to compare U.S. paper supplier and buyer perceptions about eIntermediaries. Primary data was collected from U.S. paper suppliers and buyers using mail surveys following the Tailored Design Method (Dillman 2000). Survey procedures consisted of a pre-notification postcard, an initial survey mailing, a reminder postcard, and a second survey mailing. A postage paid return envelope was provided and study respondents were offered summary results as an incentive for their participation.

Samples for the study were randomly selected from North American paper buyer and seller populations. On the supply side, samples were drawn from manufacturers of pulp, printing paper, office paper, specialty paper, and packaging products. On the buyer side, newspaper publishers, catalog printers, and commercial printers were surveyed. Sample sizes were 445 and 481 for suppliers and buyers, respectively. Adjusted response rates were 14 percent for suppliers and 5 percent for buyers. Marketing managers on the supplier side and purchasing managers on the buyer side were selected as key informants. All companies were surveyed at the business unit level, instead of at the corporate or division level, because in general eIntermediaries have not been implemented corporate wide but rather individual strategic business units have been chosen to experiment with the new technology and business processes before wider scale adoption in the organization. Due to the low response rates, the study is considered to be exploratory.

Based on the literature and past research conducted by the authors, a list of constructs and associated items was generated for supplier and buyer questionnaires. Likert-type scale questions anchored by 1= strongly disagree to 5= strongly agree or by 1=very unimportant to 5=very important, were used to measure respondents' perceptions, image, and concerns with regard to eIntermediaries.

The surveys were pre-tested with a subset of 10 suppliers and 10 buyers. An iterative process resulted in the final survey instruments. Company size was compared between early and late respondents to assess the nonresponse bias. Using two-tail t-test, no significant differences were found for neither buyers nor sellers at $\alpha=0.05$ for sales revenue and number of employees.

RESULTS

Demographics

All regions of the U.S. were represented in the respondents. Most of the paper supplier respondents are located on the north/central (34 percent) and the southern states (32 percent) of the United States, which correlates with the nation's paper production facility distribution. The paper buyer respondent distribution is concentrated in the southern states (44 percent) of the United States, although the printing industry in general is evenly dispersed throughout the country (**Figure 2**).

The majority (58.3 percent) of suppliers indicated that they produce packaging materials. The respondents' product distribution is strongly concentrated on papers with greater basis

weight (12 points or more): specialty papers, containerboard, packaging products, paperboard, and folding carton. Only 23.4 percent of respondents produce printing paper or office/commercial paper. One business unit can have several different types of paper machines, thus multiple responses were possible. The majority of paper buyer respondents are from the largest printing industry segments: commercial printing and newsprint. Printing paper is purchased by 71.4 percent of the respondents, office and commercial paper by 57.1 percent, and newsprint by 23.8 percent. Also, heavier basis weight papers; such as specialty papers (25.8 percent) and packaging materials (23.8 percent), are purchased by respondents.

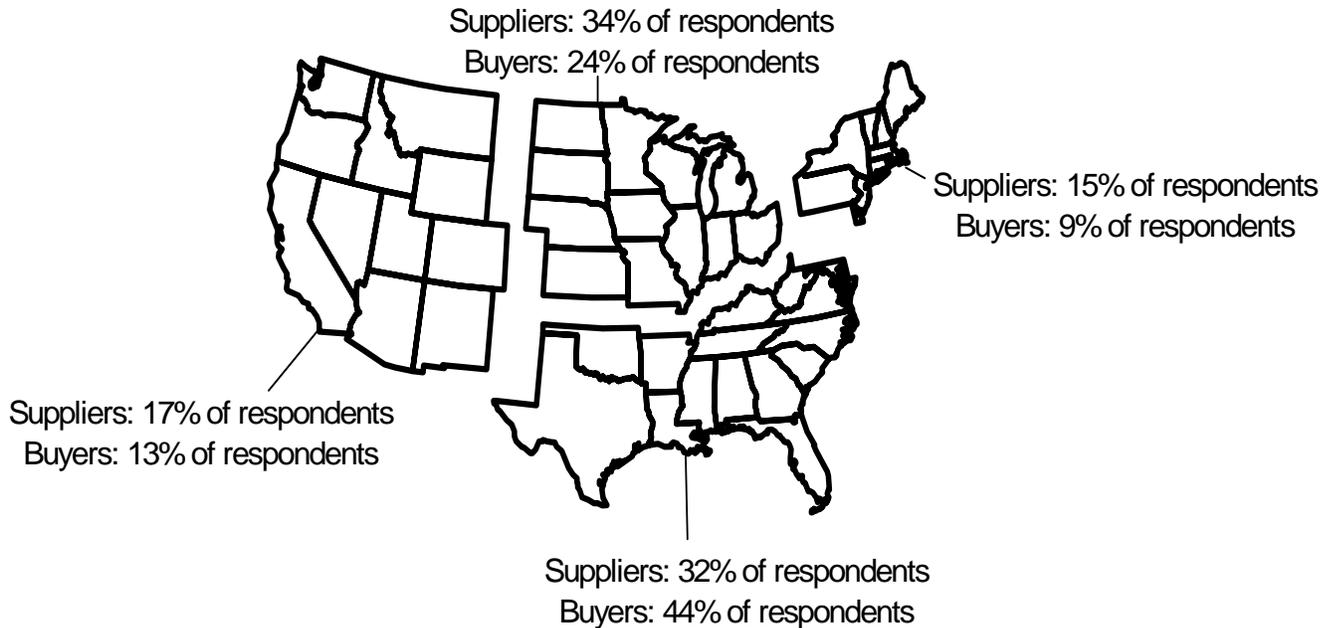


Figure 2. Respondent Location (Suppliers: n=53; Buyers: n=21)

The majority of respondents (70.7 percent) indicated that their business unit revenue was more than \$13 million in 2002. One-third of supplier respondents (33.9 percent) had a corporate-wide revenue more than \$5 billion in 2002. Seventy percent of paper buyers had business unit revenue more than \$11 million in 2002. This is consistent with the fact that the printing industry is formed by numerous small size printing facilities. However, large printing and publishing industry members with more than \$1 billion in corporate revenue (15.0 percent) are also represented in the study. A two-sample t-test at $\alpha = 0.05$ did not result in a statistical difference between supplier and buyer sales. Two-sample t-tests are used in comparisons throughout this article because they are appropriate for comparisons when small samples are used (Freund 1984).

Willingness to use eIntermediaries

Willingness to use eIntermediaries to conduct eCommerce transactions was almost identical between suppliers and buyers (3-point scale: Not willing at all; Somewhat willing; Very willing) (Pearson Asymtotic Chi-Square Significance=0.969). Seven percent of supplier and six percent of buyer respondents said they were “very willing”. In addition, two and 14 percent of suppliers and buyers, respectively, said they “would never sell/buy using eIntermediaries.”

Perceptions of eIntermediary benefits and concerns

One goal of the study was to understand supplier/buyer perceptions about the potential benefits and concerns about using eIntermediaries. On a Likert-type scale anchored on 1=strongly disagree, 3=neutral-neither disagree nor agree and 5=strongly agree, both suppliers and buyers have a fairly lukewarm view on the benefits of using eIntermediaries. Of the 11 potential benefits posed to respondents, statistical differences using two-tail t-tests at $\alpha = 0.05$ were found for two benefits. First, suppliers felt more strongly, although indifferent (3.0 relative to 2.4 for buyers), that using eIntermediaries would enhance their company’s overall image. Also, buyers believe more strongly that eIntermediary usage would harm their customer/supplier relationship (3.3 relative to 2.9 for suppliers).

A maximum likelihood factor analysis was conducted on relationship items (Hair et al. 1992) (**Table 1**). Factors can be construed as being surrogate variables having analytical and managerial implications. Surrogate variables are particularly useful in exploratory research (Hair et al. 1992). An iterative process resulted in a reduction from ten items for suppliers and eight items for buyers, respectively, into two underlying factors: Business Practice-Driven Advantages and Technology-Driven Advantages.

Factor loadings greater than 0.50 were used as separation criteria to reduce the data. For suppliers, these two factors represent 61 percent of the variance in the ten items and for buyers, 68 percent of the variance in the eight items was explained.

Table 1. Benefits from Selling Paper Using eIntermediaries (Suppliers: n=56 respondents; Buyers: n=21 respondents)

	Factor	
	Business Practice-Driven Advantages	Technology-Driven Advantages
increase the level of customer service.	.845	.316
make your company more responsive to your customers.	.828	.378
increase shareholder value.	.815	.316
offer a superior way to do business.	.733	.331
lower costs of doing business.	.697	.244
offer a good way to generate sales.	.670	.379
enable faster delivery.	.590	.399
increase access to industry information.	.236	.819
offer timeliness of information exchange.	.398	.802
offer perceptions that my company is on the cutting edge of technology.	.471	.787

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

Both suppliers and buyers are concerned that using eIntermediaries would lead to loss of contact with buyers/suppliers (**Figure 3**). On the other hand, neither group believes that eIntermediaries are a passing fad. Except for two items, supplier and buyer responses differed significantly (two-tail t-tests; $\alpha = 0.05$) on all other concerns. In all cases, suppliers have greater concerns about eIntermediary implementation than buyers. The greatest concern that suppliers have on are the questions on profitability (3.8), security of sensitive information (3.6),

availability of technical resources (3.6), costs (3.6), and the need to restructure their established business processes (3.6). Paper buyers are less concerned about these changes in business processes and procedures. Overall, buyers were less concerned about eIntermediary implementation than the buyers. This might be due to buyers' lower involvement with eIntermediaries, while low involvement usually leads to lower concerns, or greater confidence in their organizational capabilities in implementing new technologies.

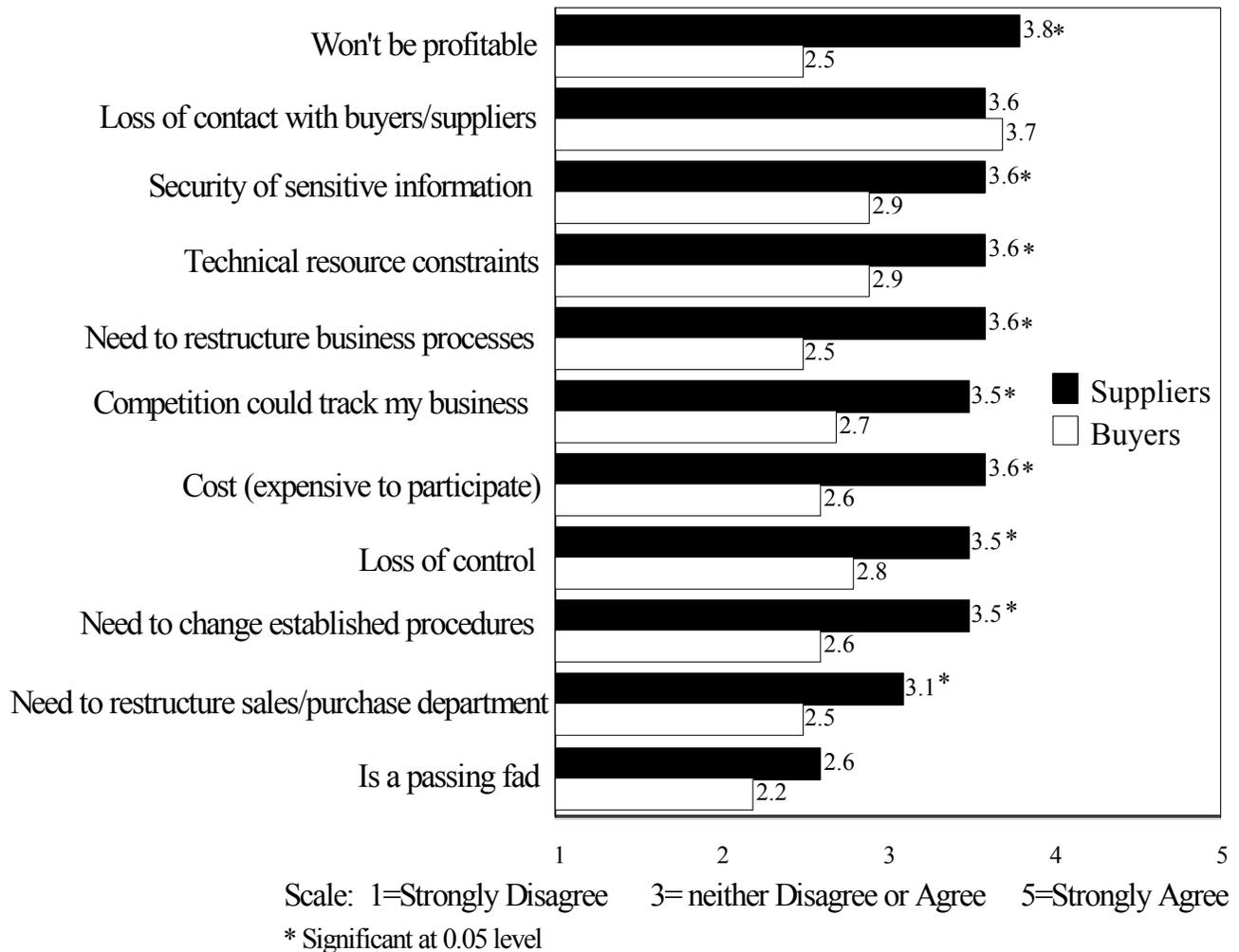


Figure 3. Concerns about using eIntermediaries (Suppliers: n=56 respondents; Buyers: n=21 respondents)

Impediments to eIntermediary implementation

Paper suppliers perceived that a number of factors have impeded their company's implementation of the use of eIntermediaries while buyers generally perceived impediments to be less of an issue (Figure 4). Suppliers stated, in ranked order, that lack of understanding the benefits of eIntermediary implementation (3.2), management resistance (3.2), and inadequate application tools (3.1) would impede their eIntermediary implementation, although none of these were far from 3.0, the neutral point. Customer/supplier resistance and employee resistance were perceived to be less of an impediment to implementation for both suppliers and buyers.

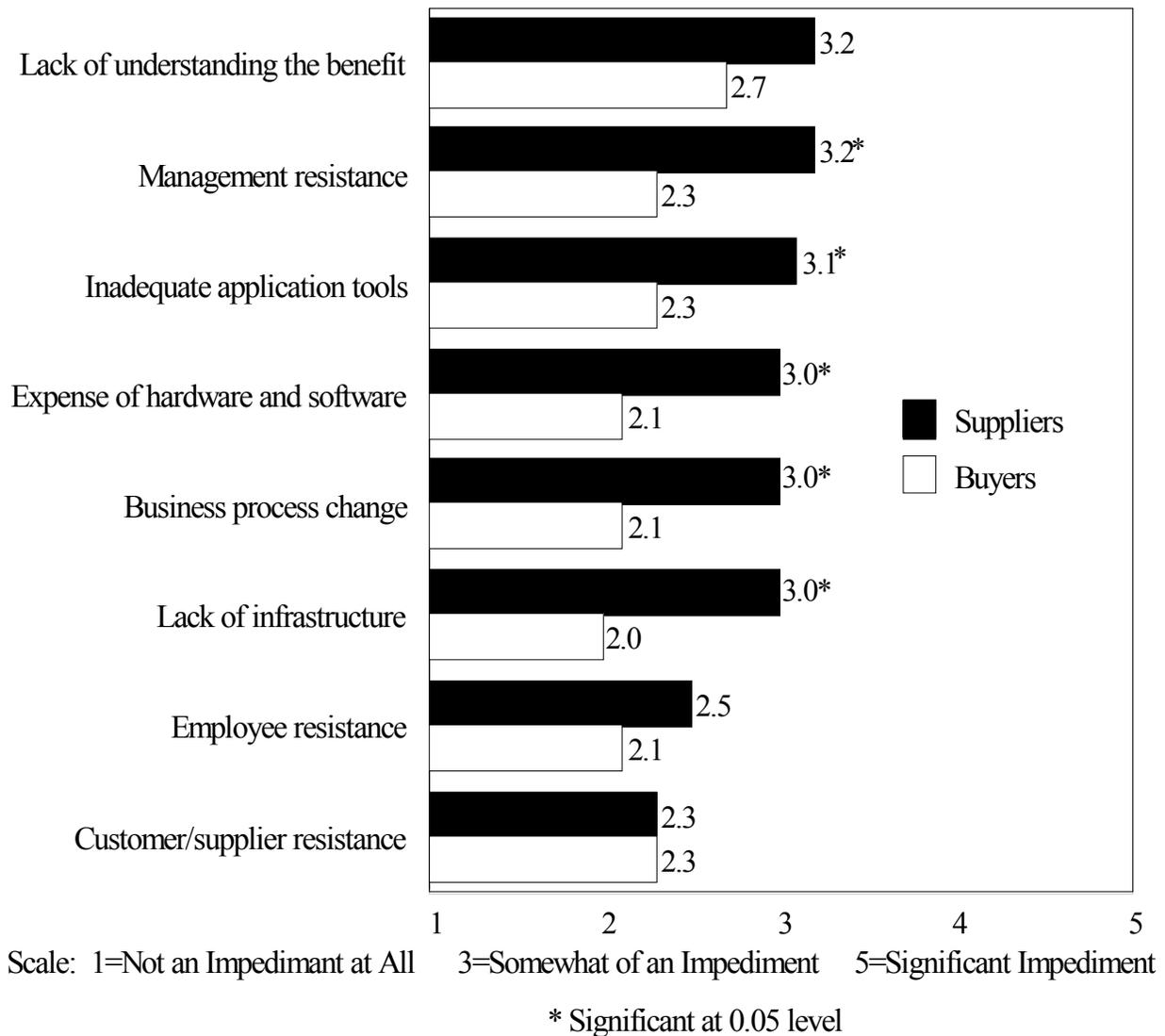


Figure 4. Factors that have impeded eIntermediary implementation (Suppliers: n=51 respondents; Buyers: n=19 respondents)

The U.S paper industry has been using the Internet for many years to facilitate intra-company business processes as well as to conduct business with exchange partners (Vlosky 2000). We thought it would be interesting to compare respondent views on using eIntermediaries relative to using the Internet in general. We compared responses on three business related issues: superiority as a way to do business, customer service provided by suppliers, and lowering the cost of doing business (Table 2). Using a Likert-type scale anchored on 1=strongly disagree, 3=neutral-neither disagree nor agree and 5=strongly agree,

Differences in perceptions of these benefits are all statistically significant for suppliers (two-tail t-tests; $\alpha = 0.05$) with mean agreement higher for Internet technologies vis a vis using eIntermediaries. This could be because of respondent familiarity with the Internet and a certain comfort level with using it for business. eIntermediaries, on the other hand, are a more recent

phenomenon and have a checkered history of success. For buyers, overall mean responses were lower for Internet technologies and eIntermediaries and no statistical differences were found.

Table 2. Perceptual differences between using Internet applications in general and eIntermediaries (Suppliers: n=55 respondents; Buyers: n=21 respondents)

Suppliers

		Mean	Std. Deviation	Sig.	Mean difference
<u>Internet vs. eIntermediary offers a superior way to do business.</u>	Internet	3.18	1.20	0.003	0.53
	eIntermediary	2.65	1.10		
<u>Internet vs. eIntermediary increases vendor level of customer service.</u>	Internet	3.49	1.23	0.000	0.72
	eIntermediary	2.77	1.12		
<u>Internet vs. eIntermediary lowers cost of doing business.</u>	Internet	3.05	1.16	0.006	0.36
	eIntermediary	2.69	1.03		

Buyers

		Mean	Std. Deviation	Sig.	Mean difference
<u>Internet vs. eIntermediary offers a superior way to do business.</u>	Internet	2.67	1.07	1.000	0.00
	eIntermediary	2.67	0.86		
<u>Internet vs. eIntermediary increases vendor level of customer service.</u>	Internet	2.67	1.20	1.000	0.00
	eIntermediary	2.67	0.73		
<u>Internet vs. eIntermediary lowers cost of doing business.</u>	Internet	2.81	0.93	0.540	0.10
	eIntermediary	2.71	1.06		

1=strongly disagree, 3=neutral-neither disagree nor agree and 5=strongly agree

Summary and conclusions

The goal of this study was to compare paper supplier and buyer perceptions regarding using eIntermediaries to conduct business. Results indicate that paper buyer and supplier respondent attitudes and expectations regarding the use of eIntermediaries do not differ significantly. In addition, neither group has a strong desire to use eIntermediaries. Overall, respondents are fairly ambivalent, holding neither a significantly negative nor positive image of eIntermediaries.

Suppliers are most concerned with profitability, loss of contact with customers, security of sensitive information, technical resources, implementation costs, and the need to restructure established business processes. The only major concern for buyers is the loss of contact with suppliers. Differences found between buyer and supplier concerns on eIntermediary implementation and factors impeding eIntermediary implementation imply that eIntermediaries should segment their offerings and marketing communications to buyers and suppliers.

Results suggest that neither paper buyers nor suppliers are pushing the other group to eIntermediary adoption. This implies that suppliers and buyers can evaluate the potential benefits and concerns from eIntermediary facilitated eCommerce jointly and at the same pace with their business exchange partner. This will reduce potential friction in the exchange relationship. eIntermediaries appear to be the primary impetus in trying to drive the paper supply chain to eIntermediary participation. Based on the low adoption and high failure rates of pulp and paper eIntermediaries, they seem to have underestimated the complexity of the paper supply chain and overestimated companies' ability to adopt eCommerce.

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