

# Forest Products Industry in a Digital Age: Factors Affecting Social Media Adoption

Kathryn Gazal  
Iris Montague  
Rajendra Poudel  
Jan Wiedenbeck

---

## Abstract

The use of social media as a marketing tool has increased significantly in recent years. However, limited information is available regarding social media use in the US forest products industry or social media adoption at the organizational level, especially within the business-to-business context. This study presents part two of a two-part series of articles that look at the forest products industry in the digital age. A mail survey was conducted in 2013 to examine factors affecting the use of social media in the US forest products industry. This article also looks at the perception of forest products companies regarding social media effectiveness and identifies challenges faced by the forest products companies regarding social media use. Results show that close to 58 percent of respondents currently use some form of social media. The most common social media tool implemented was Facebook. Respondents' adoption of social media was influenced by company age, net sales revenue, product type, Web site content, perceived importance of e-commerce, and perceived ease of use of social media as a marketing tool. About 94 percent of the respondents thought that social media was an effective tool for marketing. Although no major concerns were expressed regarding the use of social media, there was some concern about generating the return on investment to cover the costs associated with social media use. The information collected from this study can be used in assisting the forest products industry in understanding the world of social media marketing and developing an effective social media marketing strategy.

---

The electronic marketplace, which is referred to as the emerging market economy, where buyers and sellers interact electronically or digitally in some way, has grown exponentially in the last 2 decades and it continues to change at a stunning pace. Through the adoption of the Internet, the face of marketing has changed dramatically. Companies are now able to send promotions and advertisements that are able to reach the vast majority of people on the planet faster than ever (Yee and Yazdanifard 2013). Industries have had to change how they implement and plan their marketing messages to respond to the growing demands of evolving communication technology (Grainger 2010). The “World Wide Web” has given consumers a venue to voice experiences, recommendations, and preferences. In turn, this has also given firms a new way to reach consumers and gather marketing data more easily (Trusov et al. 2009). One of the most widespread contemporary tools that has emerged as a result of the rise of the digital market is the use of social media as a marketing tool. Social media is a broad term that refers to software tools that create user-

generated content that can be shared (O'Reilly 2005). Social media tools include social network sites, blogs, wikis, online photo and video-sharing sites, and really simple syndication status updates sites. Social media marketing is a system that allows marketers to engage, collaborate, interact, and harness crowd-sourcing-based intelligence for marketing purposes (Chikandiwa et al. 2013). Such social network

---

The authors are, respectively, Associate Professor, West Virginia Univ., Forestry and Natural Resources, Morgantown (kathryn.arano@mail.wvu.edu [corresponding author]); Research Forester, Northern Research Sta., USDA Forest Serv., Starkville, Mississippi (imontague@fs.fed.us); Postdoctoral Fellow, Large Lakes Observatory, Univ. of Minnesota Duluth, Duluth (rppoudel@d.umn.edu); and Research Forest Products Technologist, USDA Forest Serv., Princeton, West Virginia (jwiedenbeck@fs.fed.us). This paper was received for publication in February 2015. Article no. 15-00007.

©Forest Products Society 2016.

Forest Prod. J. 66(5/6):343–353.

doi:10.13073/FPJ-D-15-00007

sites as Twitter, Facebook, YouTube, and LinkedIn have given companies and consumers more direct interaction.

Boyd and Ellison (2008) classify a social network as Web-based service sites that allow individuals to (1) construct a public or semipublic profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. Companies all over the world have responded to the strategic and operational benefits attributed to using social media as a marketing tool. Some of these benefits include gaining comprehensions into consumer behavior and preferences, urging consumers to share the brand's message as word of mouth to their peers, increasing brand message exposure, connecting to consumers for research and development, building and increasing brand awareness, increasing brand equity, improving search-engine rankings, and driving traffic to corporate Web sites (Palmer and Koenig-Lewis 2009, Trusov et al. 2009, Leberherz 2011). Social media tools bring opportunities to business firms, often at minimal cost given many tools are free and easily accessible (Chikandiwa et al. 2013). These benefits of social media have been popular among business-to-consumers (B2C) companies since the development of online technologies (Buss and Begorgis 2015). However, business-to-business (B2B) companies have been slow to adopt social media and have shown lesser interest on this compared with B2C companies (Michaelidou et al. 2011). These differences in adoption trend can be attributed to differences between B2C and B2B in terms of the markets, products, and product development. For B2B companies, products are generally more complex, product development takes longer, and the customer base is usually large organizations instead of single individuals as the case with B2C companies (Karkkainen et al. 2010). B2B companies have struggled in implementing social media because of their lack of understanding of the phenomenon (Swani et al. 2014). However, the benefits of social media can also be experienced in a B2B context and can also be an important marketing tool for these companies, but the approach to using social media might be different. For example, Jussila et al. (2014) have shown that external use of social media (e.g., employee brand and recruitment, communication with partners and customers, and sales support) has the highest potential for B2B companies. According to Swani et al. (2014), B2B marketers have used social media to enhance customer relationships and to promote corporate branding rather than focusing on product brands compared with B2C companies. Similarly, Brennan and Croft (2012) have shown that B2B companies in the technology sector have used social media tools successfully to position their brands as leaders in highly dynamic sectors. Branding is very important for B2B firms, especially in creating a unique and consistent identity (Mitchell et al. 2001, Leek and Christodoulides 2011), and social media can be a useful platform for this. B2B companies have also utilized social media to optimize the benefits of search engines and to drive traffic to their home pages (Järvinen et al. 2012). The use of social media by B2B companies is becoming increasingly important. Investments in digital marketing are actually higher among B2B firms compared with B2C firms (Katona and Sarvary 2014).

Social media can therefore be used strategically by firms for their marketing efforts (Oztamur and Karakadilar 2014),

especially in the context of B2B companies. In fact, the use of social media as part of a firm's marketing strategy is increasing. However, for social media to work, companies should focus on the content quality (not just quantity), building trust with customers, involvement (e.g., companies should be fully committed to spend their time and thoughts on being actively engaged in their social media marketing), and integration with other media platforms (e.g., company Web site; Miller and Lamma 2010, Neff 2010, Pradiptarini 2011, Oztamur and Karakadilar 2014). Building and maintaining relationships with customers is also an important strategy in using social media as a marketing tool. In fact, these are considered to be the most important goals among B2B companies when using social media (Michaelidou et al. 2011). Firms can create customer value in these relationships because being closer to the customers will enable the firms to create a unique brand identity and to differentiate themselves from the competition (Michaelidou et al. 2011). Customers should not only be seen as receivers of the output of the firm but should also be seen as co-producers and influencers of the relationship that the company has with them (Durkin et al. 2013). In addition, another strategic opportunity for firms is to develop and manage a resource-bound social media strategy that adds value to the experience of its customers. Durkin et al. (2013) also point out the need for a dedicated social media person to follow up on customer inquiries, technological capability, and organizational capacity.

The effectiveness of social media needs to be evaluated just like any other marketing tool, as marketers are always under pressure to show returns for their investment (Michaelidou et al. 2011). Thus, the development of the right metrics to measure effectiveness is critical. However, very limited information is available to answer some of the key issues related to effectiveness of social media marketing (Pradiptarini 2011) and this is considered as one of the barriers for B2B companies when using social media (Michaelidou et al. 2011). Even information on the most common metric to measure effectiveness, that is, return on investment (ROI) from social media use, is limited (Vaynerchuk 2011). Companies therefore resort to other metrics to measure social media effectiveness, which include Web site traffic, hit rates, number of postings, number of visitors, number of followers, time spent online, etc. However, these metrics may not necessarily capture the impact of social media on company performance (Oztamur and Karakadilar 2014). Thus, other qualitative metrics may provide additional insights as to the effectiveness of social media. For example, Paniagua and Sapena (2014) have shown that user-generated content in social media significantly affected the financial performance of firms.

The use of social media as a marketing tool has increased significantly in the past few years, but very few studies have looked at social media adoption among organizations, especially within the context of B2B organizations. Sinclair and Vogus (2011) examined the adoption of social networking sites by large global organizations and found that there is an increased use of social media among global organizations. They used the "adaptive structuration" theory to identify trends across industries and organizational change resulting from the adoption of social media. Their results showed that some companies are more focused and organized in their use of social media, whereas others showed a more reactive, less consistent, and less integrated

use. Other succeeding studies on social media adoption support these findings about how companies vary in their level of social media adoption. Thackeray et al. (2012) evaluated the adoption and use of social media among public health departments in the United States. They concluded that social media adoption by public health agencies is in the early stages and that social media is being used as a channel to distribute information rather than creating conversations and engaging with the audience. These agencies do not seem to take advantage of the interactive possibilities offered by social media. Chikandiwa et al. (2013) also found this to be the case about the social media adoption among South African banks as well as among the wellness industry in Sweden investigated by Lagrosen and Grunden (2014). Durkin et al. (2013) also found that the motivations for social media adoption among small to medium enterprises are internally driven rather than being customer driven. Other organizations are more proactive in their use of social media. For example, Barnes and Jacobsen (2013) found that the fastest growing small businesses in the United States are no longer just adopting, but adapting in terms of their social media use. These companies are taking advantage of new social media tools not by increasing general usage but by making calculated decisions. For example, they can monitor outcomes of the different tools and can therefore make a decision on which social media tool is successful and which ones are useless.

Few studies have examined the factors affecting social media adoption among organizations. Mandal and McQueen (2012) extended the use of the Unified Theory of Acceptance and Use of Technology (UTAUT) to explain social media adoption by microbusinesses and found that owner characteristics and organizational efforts (e.g., time) and expectation (e.g., usefulness) were the major determinants of social media adoption. Dahnil et al. (2014) examined factors that drive small to medium enterprises to adopt social media marketing by reviewing existing literature on technology adoption. Social media marketing adoption factors identified include end users, and organizational, technological, management, and business environments. Lorenzo-Romero et al. (2014) examined the factors affecting the acceptance of social media as a business strategy by the Spanish retailers using the Technology Acceptance Model (TAM). Their results confirmed the role of perceived ease of use in the adoption process. More recently, Nah and Saxton (2013) investigated the factors affecting social media adoption by nonprofit organizations. They identified strategy, capacity, governance, and environment as key determinants of adoption.

With regard to the forest products industry, even fewer studies are available about social media adoption. It is interesting to see how the forest products industry sector is responding to this social media trend given the sector's contribution to the US economy. The industry accounts for approximately 5 percent of total US manufacturing gross domestic product. It contributes about \$175 billion in products and 900,000 jobs annually (American Forest & Paper Association 2012). Most studies in the forest products industry focused on Internet usage or e-commerce (e.g., Vlosky et al. 2002, Stennes et al. 2006, Arano and Spong 2012). Both US and Canadian forest products firms have been slow in incorporating information technology into their businesses (Hewitt et al. 2011) compared with other industries. Felzensztein and Gimmon (2008) examined the

use of social networking in the natural resources sector in Chile. Most of the companies surveyed indicated that feedback on marketing performance was their most sought-after reason for using social media. Montague (2011) conducted a preliminary study regarding the application of social media among the Appalachian hardwood manufacturers in the United States. Only 9 percent of those surveyed in 2010 used social media as a marketing tool. Many of the companies were unsure of the benefits of devoting their resources to social media. On the basis of these studies, the US forest products industry seems to be lagging behind in the use of e-commerce in their businesses and more so in the application of social media as a marketing tool.

Social media could be a very useful marketing tool for the forest products industry given its nature. The forest products industry is generally fragmented and social media can be a tool to position itself in the market. In addition, the industry usually has many distribution channels, making it more difficult for customers to receive quality products in a timely manner, and social media marketing can help with this. There are significant benefits that can be accrued by establishing more direct, personal contact with customers so they are kept informed of product-related news and trends (Montague 2011). This article presents the second part of a two-part series that looks at the forest products industry in the digital age. The first part of the series looks at the different types of e-commerce and social media tools forest products companies in the United States use and identifies and describes the reasons for using and perceptions held by managers related to social media as a marketing tool (Montague et al. 2016). The main objective of this article is to examine the factors affecting social media adoption among the US forest products companies. Second, this article looks at the perception of forest products companies regarding social media effectiveness and how these companies measure the effectiveness of social media as a marketing tool. Last, this study identifies challenges faced by the forest products companies regarding social media use. This study is important because there is limited information regarding organizational motives for social media adoption, especially in the forest products industry. Most studies on social media are focused on adoption by individuals, but there is a lack of organizational-level research on social media adoption (Nah and Saxton 2013) and lack of academic attention on examining adoption criteria, challenges, issues, and motives/factors for social media adoption (Durkin et al. 2013, Lorenzo-Romero et al. 2014). This study therefore aims to fill part of this research gap. The foundation established by the information from this study will enable the forest products industry to be more strategic as they move toward adopting new marketing strategies.

## Methodology

### Survey data

A mail survey was conducted in 2013 to collect information on social media use among members of the US forest products industry. Information collected in the survey included industry characteristics (e.g., manufacturing locations, size, net sales revenue, product types), e-commerce activities (e.g., types of e-commerce tools used, importance of e-commerce, concerns about e-commerce use, Web site information), social media use, perceived

benefits from the use of social media as a marketing tool, impediments and constraints in the use of social media as a marketing tool, reasons for not using social media, and perceived effectiveness of social media as a marketing tool.

A directory of forest products industry participants under the Standard Industrial Classification (SIC) codes that includes lumber (SIC 2421), furniture (SIC 2511), and other forest products (SIC 2611, SIC 2621, and SIC 2631) was obtained from Dun & Bradstreet, which is the world's leading source of commercial information, including databases for businesses. A random sample of 1,600 companies was included in the survey. Dillman's (2000) Tailored Design Method was used in developing and administering the mail survey. Three mailings were sent to potential respondents to ensure a high response rate, including the initial mailing, a follow-up mailing (2 weeks after the initial mailing), and a final mailing (4 weeks after the initial survey).

## Analysis

Summary statistics were calculated for the variables collected from the survey. In addition, a model was developed to examine the factors affecting social media adoption among the US forest products industry.

Social media adoption can be viewed as an adoption of a "new technology." Adoption of technology by individuals has been explained by several theoretical models like the TAM (Davis 1989), which assumes that usefulness and perceived ease of use determine an individual's intention to adopt a system; the UTAUT (Venkatesh et al. 2003), a variation of TAM, which assumes that performance expectancy, effort expectancy, social influence, and facilitating conditions (e.g., age) are key determinants of usage intention and behavior; and the Innovation Diffusion Theory (Rogers 1995), which states that "innovation is communicated through certain channels over time among members of the social system." These models have also been used to explain adoption behavior of organizations. Kalish (1985) developed a framework based on the Innovation Diffusion Theory and assumes that the adoption of a new product is characterized by awareness and adoption, which is controlled by advertising and price. Verheyden and Goeman (2013) used these models as the basis for investigating why organizations adopt social media for business purposes by specifically looking at company size. More recently, Nah and Saxton (2013) proposed a theoretical framework that integrates four key factors that affect organizational-level adoption and use of social media. These factors include strategy, capacity, governance, and environment. This article builds upon the theoretical framework proposed by Nah and Saxton (2013) and also incorporates the TAM by Davis (1989) and Rogers (1995). Specifically, it is hypothesized that social media adoption in the US forest products industry is influenced by organizational capacity, strategy, and perception about the ease of use or complexity of social media as marketing tools. Organizational capacity determines the firm's ability to successfully adopt a new technology. Thus, organizations that have the existing resources and capacities to support technology use are more likely to adopt the technology (e.g., social media). Organizations also choose specific strategies to achieve their goals (Nah and Saxton 2013). If these strategies can support or can complement social media use, then they are more likely to adopt social media in their marketing efforts.

Last, the organizations' perception about the ease or complexity of social media will influence their decision to adopt. Organizations that have a negative perception about the usefulness of social media will less likely adopt it for fear that it will not work, compared with those that think highly of social media.

The response variable used in the empirical model was whether or not a firm uses social media as a marketing tool. The decision to use social media as a marketing tool was hypothesized to be influenced by three groups of variables: organizational capacity, strategy, and perception about ease of use. Organizational capacity can be measured by looking at organizational characteristics. Organizational characteristics have been shown to be potential determinants of the adoption process (Ghobakhloo et al. 2012). The variables representing organizational characteristics include number of manufacturing locations, number of employees, years in business or company age, net revenues, product types, and Web site content. The size of an organization can influence its adoption of new technology or innovation (Shook et al. 2002, Hewitt et al. 2011, Verheyden and Goeman 2013). It is hypothesized that smaller organizations are less likely to adopt social media compared with larger organizations. Smaller organizations usually have financial constraints, they lack professional expertise to handle new innovations, and are more susceptible to external factors (Rahab and Hartono 2012). Smaller organizations are faced with substantially more barriers to adoption. Thus, adoption of new technology like social media will be more difficult for them compared with larger organizations because of these constraints or barriers. On the other hand, larger organizations usually have the personnel and resources needed to adopt new technology like social media. The number of manufacturing locations and number of employees were included in the model as measures for company size and organizational size. Firm age has been shown to significantly influence adoption of technology (Das and Das 2012, Alderete and Gutierrez 2014). Firm age plays an important role in the innovative performance of firms (Yildiz et al. 2013) such as choosing to adopt social media. Durkin et al. (2013) also suggested that firm age as an influence on the adoption and utilization of social media should be looked at. Hence, firm age was included as a variable in the empirical model. It is hypothesized that older organizations are more likely to adopt social media. The reason for this is because older organizations have had the time to build the capacity and resources needed to support adoption of new innovations like social media. A company's financial assets as measured by net sales revenue are important for adoption of any new technology, as implementation of these new technologies comes at a price (Ghobakhloo et al. 2012, Nah and Saxton 2013, Verheyden and Goeman 2013). In fact, lack of financial resources is one of the barriers for social media adoption (Verheyden and Goeman 2013) and actually the largest barrier to B2B digital marketing usage (Järvinen et al. 2012). Thus, companies with higher financial capabilities are more likely to adopt social media because they are able to afford the cost associated with implementation. Product type (i.e., industrial products, consumer products) is another organizational characteristic that affects technology adoption (Porter and Millar 1985, Salmeron and Bueno 2006, Ghobakhloo et al. 2012). Companies that make products that have high value-added components (e.g., consumer products) are more likely to take advantage of

social media to reach a broader consumer group. Consumer products can benefit from product differentiation offered by social media marketing. Another variable that was used to represent capacity is Web site content. Web site content describes the number of types of information found on the company Web site. Preexisting Web site capabilities can be an important tool that can support adoption of other Web-based technologies (Hackler and Saxton 2007, Kropczynski and Nah 2011, Nah and Saxton 2013). Companies with more information on their Web sites are more likely to adopt social media because they have a more developed platform to support social media use. More comprehensive Web sites can be regarded as additional resources that companies can take advantage of to successfully implement new information technology like social media (Hackler and Saxton 2007, Kropczynski and Nah 2011).

The second group of variables included in the model is strategy as measured by e-commerce usage of companies. Organizational strategies have implications on the use and adoption of new media like social media (Hackler and Saxton 2007). Many US companies, ranging from electric utilities to credit card firms to computer equipment manufacturers and even the forest products companies, have adopted e-commerce to maintain a competitive advantage in their businesses (Georgiou and Stefanias 2002, Vlosky and Smith 2003, Arano and Spong 2012). E-commerce usage is represented by two variables: the number of e-commerce tools used and perceived importance of e-commerce. Companies that rely heavily on e-commerce tools and those that think that e-commerce is important are more likely to adopt social media. This is because e-commerce tools can strengthen and complement the use of social media and vice versa. E-commerce is often used by organizations to gain competitive advantage (Georgiou and Stefanias 2002), and social media can be an additional tool in promoting a company's business.

The last variable included in the model measures companies' perception about ease of use as suggested by Davis' (1989) TAM. Specifically, this variable indicates whether or not a firm has a concern about the different challenges associated with using social media (e.g., ROI). Companies who expressed concerns about social media use are less likely to adopt social media. This is because a negative perception about the usefulness of a new technology or innovation may discourage organizations to try to use it.

The empirical model is therefore expressed as the following:

$$\begin{aligned} \text{MEDIA} = & \beta_0 + \beta_1 \text{LOCATION} + \beta_2 \text{EMPLOY} + \beta_3 \text{AGE} \\ & + \beta_4 \text{REVENUE} + \beta_5 \text{PRODUCT} \\ & + \beta_6 \text{WEBSITE} + \beta_7 \text{TOOLS} \\ & + \beta_8 \text{IMPORTANCE} + \beta_9 \text{EASE} + \varepsilon \end{aligned} \quad (1)$$

where  $\beta_i$  are the model coefficients and  $\varepsilon$  is the error term. The dependent variable (MEDIA) has two responses, "1" if the firm has adopted any type of social media and "0" if not. Descriptions of independent variables are reported in Table 1.

Because of the binary nature of the dependent variable, a binary logistic regression model was used to model the factors affecting social media adoption. Logistic regression is based on the cumulative logistic probability function and estimates the probability of a certain action given a set of

categorical characteristics (Pindyck and Rubinfeld 1981):

$$P_i = E(Y = 1|X_i) = \frac{1}{1 + e^{-(\alpha + \beta_i X_i)}} \quad (2)$$

where  $P_i$  is the probability that a company adopts social media,  $\beta_i$  the model coefficients, and  $X_i$  the independent variables. LIMDEP (Version 8.0) software was used to estimate the model parameters.

## Results and Discussion

### Survey results

Of the 1,600 potential respondents, a total of 596 surveys were returned because of undeliverable addresses and respondents who did not qualify. The total number of usable responses was 166, which accounts for a 16.53 percent response rate. To address the possibility of a nonresponse bias, the distribution of early respondents was compared with the distribution of late respondents on the basis of three demographic variables, firm size, years in business, and net revenue, using the Kolmogorov-Smirnov test (K-S test). The basic assumption is that late respondents are a proxy for non-respondents (Lin and Schaeffer 1995). Results of the K-S tests indicate that the distribution of the early respondents with respect to firm size (K-S statistic = 0.16), years in business, (K-S statistic = 0.04), and net revenue (K-S statistic = 0.15) was not statistically different from that of the late respondents. Thus, the survey results are judged to be sufficiently representative of the study population.

### Factors affecting social media adoption

The majority of the companies surveyed (58%) have used some form of social media in their marketing efforts, with

*Table 1.—Description of variables used in the regression model that examine the factors affecting social media adoption among responding companies in the US forest products industry.*

Variables	Definition
Organizational capacity/characteristics	
LOCATION	No. of manufacturing locations
EMPLOY	No. of employees; 0 = 1–19, 1 = 20–49, 2 = 50–99, 3 = 100–499, and 4 = 500 or more
AGE	Company age in years
REVENUE	Net sales revenue generated in 2012 in US dollars; 1 = more than \$1 million and 0 = less than \$1 million
WEBSITE	Amount of Web site information or number of information found on company Web site (e.g., product pictures, language translation, product literature, etc.)
PRODUCT	Company product type; 1 = industrial and 0 = if otherwise
Organizational strategy	
TOOLS	No. of e-commerce tools used
IMPORTANCE	Importance ranking of 12 different aspects of e-commerce; level of ranking is from 12 (not important) to 60 (very important)
Perception about ease of use or complexity of use	
EASE	Ranking of concerns about social media use (e.g., concern about return on investment); level of concern from 1 (not a concern) to 5 (a major concern)

Facebook being the most common social media tool adopted. Although this adoption rate is relatively higher than the e-commerce adoption in the industry in general (e.g., Shook et al. 2002, Vlosky and Smith 2003, Arano and Spong 2012), there is still a tremendous opportunity in social media for these companies. This adoption rate lags behind compared with fast-growing companies (i.e., Inc. 500) in the United States, which had a reported rate of 83 percent in 2010 (Barnes and Jacobsen 2013) and large global organizations, which were reported to be at 99 percent (Sinclair and Vogus 2011).

To understand better the social media use of forest products companies, it is important to examine the factors affecting adoption of this tool in their marketing strategies. The results of logistic regression analysis (Table 2) indicate that years in business (AGE), net sales revenue, product type, amount of available information on company Web sites, perceived importance of e-commerce, and perceived ease of use of social media were significant factors affecting social media use among the US forest products industry. Organizational strategies and internal resources and capacities can influence a company's decision to adopt new technology like social media (Corder 2001, Zorn et al. 2011, Nah and Saxton 2013). Thus, this study examined several industry characteristics as measures of organizational capacity affecting social media use. The results indicate that companies that have been established longer are more likely to adopt social media. For example, the odds of companies that have been in business longer adopting social media are 1.02 greater than those of relatively newer companies. This is because older organizations have had the time to build the capacity and resources to support adoption of new technologies. These older firms might have the technological experience necessary for adoption (Hollenstein 2004). However, theoretical arguments regarding the relationship between firm age and adoption are not conclusive (Hollenstein 2004). For example, although our results show a positive relationship between firm age and adoption, Das and Das (2012) found a negative relationship between firm age and information technology adoption.

Likewise, a company's financial assets, as measured by net sales revenue, was determined to be significantly and positively related to social media adoption. The use of social media is not cost free; thus, to be successful, organizations must devote resources in terms of time and money (Nah and Saxton 2013). One of the most important elements preventing companies from adopting social media is a lack of resources (Verheyden and Goeman 2013), and this is particularly true for B2B companies. Thus, companies who have higher net sales revenues are better able to afford the investment in social media and are more likely to use social media in their marketing efforts. In the case of the US forest products companies, the odds of companies that generated net sales revenue of >\$1 million adopting social media are 5.51 greater than those that generated <\$1 million in net revenue.

The type of products that a company offers also influences its decision to use social media. In this study, companies that only offer industrial products (e.g., lumber, pallets) were less likely to use social media in their marketing strategies than those companies that offer both industrial and consumer products (e.g., furniture, flooring, cabinets). Companies with both sets of customers have a broader consumer group to reach; thus using social media can be more beneficial. Companies offering consumer

*Table 2.—Results of the regression model that examines factors affecting social media adoption among responding companies in the US forest products industry.*

Variable <sup>a</sup>	Parameter estimate (SE) <sup>b</sup>	P value	Odds ratio	Mean (SD)
Constant	-7.76 (2.00)	0.000	0.000	—
LOCATION	0.08 (0.11)	0.465	1.08	3.10 (6.43)
EMPLOY	-0.09 (0.24)	0.708	0.91	2.09 (1.29)
AGE	0.02** (0.01)	0.005	1.03	52.66 (33.48)
REVENUE	1.71** (0.82)	0.038	5.51	0.88 (0.32)
PRODUCT	-1.29** (0.58)	0.025	0.28	0.36 (0.48)
WEBSITE	0.74*** (0.20)	0.000	2.09	3.69 (1.71)
TOOLS	0.23 (0.21)	0.290	1.25	3.81 (1.29)
IMPORTANCE	0.08** (0.28)	0.003	1.08	45.08 (12.26)
EASE	-0.40* (0.23)	0.084	0.67	3.80 (1.16)
Likelihood ratio = -56.32				
Chi-square value = 62.76				
P value = 0.00				
Total no. of observations = 130				

<sup>a</sup> See Table 1 for variable definitions.

<sup>b</sup> \* = significant at the 10 percent level; \*\* = significant at the 5 percent level; \*\*\* = significant at the 1 percent level.

products that usually have value-added components were more likely to take advantage of social media. This is consistent with Kozak's (2002) findings that industries selling products with higher-priced custom products were more likely to adopt information technology.

Companies that have comprehensive Web sites were also more likely to use social media than those without (odds = 2.09). This is because preexisting Web capabilities might constitute resources that companies can mobilize in pursuit of additional Web-based goals or might contribute to the ability of companies to successfully use information technology like social media (Hackler and Saxton 2007, Kropczynski and Nah 2011). These are companies that have more information available on their Web sites such as product pictures, language translation, customer testimonials, product design tools, software, product inventory, distribution lists, and customer service contacts.

Another factor that influences an organization's use and adoption of a new media (e.g., social media) is the strategy it uses in fulfilling its goals (Hackler and Saxton 2007). In this article, we looked at e-commerce as a strategy and therefore a factor that affects the decision to adopt social media. The results indicate that companies that regard e-commerce as important are more likely to adopt social media. Social media tools can complement and strengthen the use of e-commerce. E-commerce has played a significant role in promoting company businesses by making them more competitive (Georgiou and Stefanias 2002). Social media can therefore be part of e-commerce strategies of companies.

Last, firms that do not have major concerns about the challenges (e.g., generating ROI to cover the costs) associated with the use of social media were more likely to adopt social media. Those that have concerns were less likely to adopt. This is consistent with Davis' (1989) TAM and Rogers' (1995) argument that the more complex a technology is perceived to be, the slower will be its rate of adoption. Negative views about usefulness, staff unfamiliarity, and lack of training can slow down the adoption of any new technology like social media tools (Venkatesh and Davis 2000, Buehrer et al. 2005, Michaelidou et al. 2011).

## Social media effectiveness and challenges

The adoption of social media did not change the marketing budget for most (68%) of the responding companies. About 30 percent reported an increase in their marketing budget as a result of social media use. Even though not many companies have increased their marketing budget, social media is still considered an effective tool for marketing by most of the respondents. Although maintaining social media sites can incur significant costs, especially if companies hire dedicated social media personnel to maintain their sites, signing up for social media accounts are essentially free and easily accessible (Chikandiwa et al. 2013). This can lead companies to think they do not need to allocate more money initially toward this effort. In the case of the forest products industry, social media adoption is still in its infancy—most companies have only started using social media within the last 5 years. Therefore, companies may not have the necessary dollar metrics to justify investment toward social media. In fact, the results indicate that a great majority (94%) of the responding companies do not measure the ROI from social media use. One of the reasons for this is that using social media in marketing is relatively new and companies do not have a good understanding yet on how to capture ROI from social media use. The nature of social media as a marketing tool (i.e., mostly involving human interactions) makes calculation of ROI challenging (Blanchard 2011, Vaynerchuk 2011, Paniagua and Sapena 2014).

Instead of focusing on ROI to measure social media effectiveness, forest products companies mostly focus on other quantitative metrics (non-dollar) as well as on qualitative metrics. The top three quantitative metrics used for evaluating social media effectiveness were (1) number of site visits, (2) number of social network friends, and (3) number of comments and profile views (Fig. 1). In terms of qualitative metrics used by companies to measure social media effectiveness, the three most commonly used metrics were (1) growth of relationships with key audiences, (2) audience participation, and (3) moving from monologue to dialogue with consumers (Fig. 2). From a marketing standpoint, focusing on these metrics rather than just the

ROI may be a good social media strategy. According to Hoffman and Fodor (2010), returns from social media investment should not always be measured in dollars but also in consumer behavior (i.e., consumer investment). Focusing on consumer investments (e.g., number of site visits, comments) is an effective social media marketing strategy because it puts the brand to work for the customers by satisfying their needs to create, consume, connect, and control in the social Web. Such strategy takes into account the objective of both the brand and the online customer (Hoffman and Fodor 2010).

When asked about the effectiveness of social media as a marketing strategy, approximately 94 percent of the respondents thought that the use of social media was somewhat effective to very effective (Fig. 3). Facebook was considered to be the most effective social media forum reported by the US forest products industry. This is not surprising, as this is the largest and most widely used social network today. In the United States, 71 percent of Internet users are members of Facebook (Chase and Knebl 2011) and it is also the most common social media tool used among the fast-growing companies in the United States (Barnes and Jacobsen 2013) and in other industries (Chikandiwa et al. 2013, Sago 2013, Lagrosen and Grunden 2014). The top three company goals addressed by social media are (1) increased exposure, (2) branding, and (3) lead generation (Table 3). These are also the main reasons why large global organizations use social media and reflect a proactive approach to customer engagement that aims to build repeat customers (Sinclair and Vogus 2011).

Table 4 presents the level of concern of social media adopters and non-adopters regarding the different challenges that the company may have in using social media. Except for generating ROI to cover costs, both adopters and non-adopters have the same level of concern on these potential social media challenges. Non-adopters were more concerned about generating ROI from social media than adopters. In general, no major concerns were expressed regarding potential challenges associated with the adoption of social media except for ROI concerns and ability to

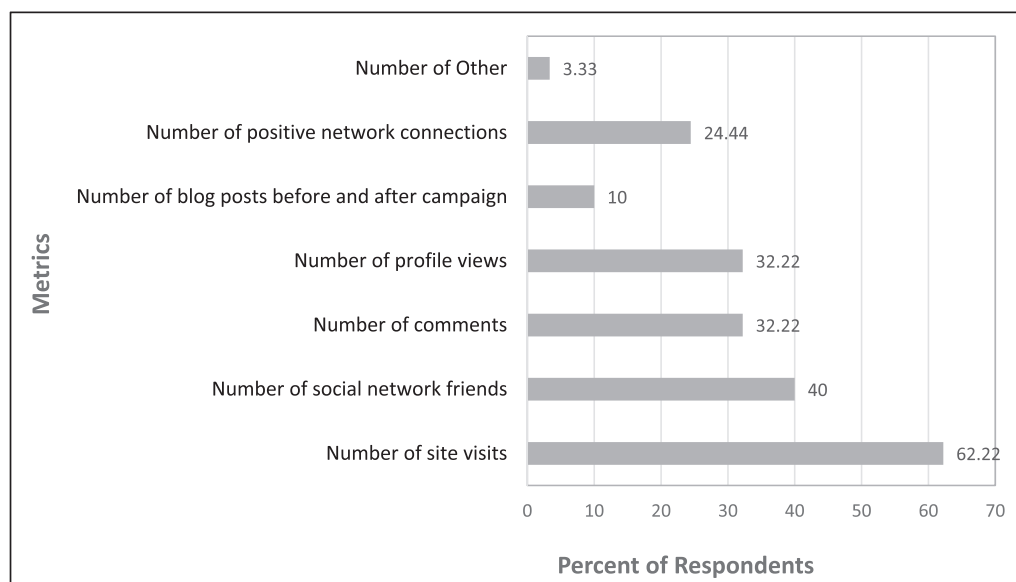


Figure 1.—Quantitative metrics used in evaluating social media effectiveness among the US forest products industry respondents.



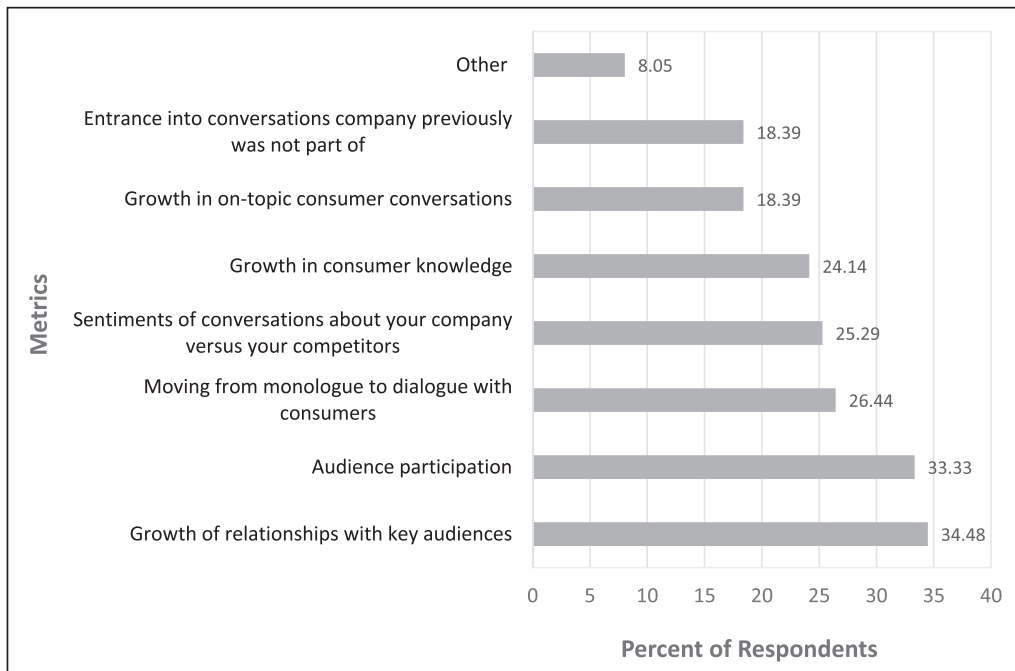


Figure 2.—Qualitative metrics used in evaluating social media effectiveness among the US forest products industry respondents.

generate member and customer activity (i.e., mean level of concern, >3.5). As mentioned earlier, lack of resources is one of the important factors preventing companies from adopting social media. Thus, companies tend to worry about whether the ROI from social media will be enough to cover the associated costs of adoption. This is even more pronounced among non-adopters. This concern about ROI can also be attributed to the fact that it is more difficult to establish ROI from social media use. It can be difficult to identify the exact benefits of a social media strategy that can be used in calculating ROI (Arno 2014) and there are often significant reservations among marketers about their ability to measure ROI from social media (Adobe Systems Incorporated 2012). According to the results of our study, the majority of the forest products industries that employ

social media in their marketing do not measure ROI at all. With regard to the ability to generate member and customer activity, both adopters and non-adopters of social media indicate that this is a relatively major concern. This may be attributed to the fact that tracking customer activities (e.g., site visits) is one of the major measures respondents used in evaluating social media effectiveness.

### Summary and Conclusions

The goal of this research was to gain insight into the use of social media tools by the US forest products companies. Although the survey results indicate that most forest products companies in the United States use some form of social media tool in their business, there remains a tremendous opportunity for growth. The industry should

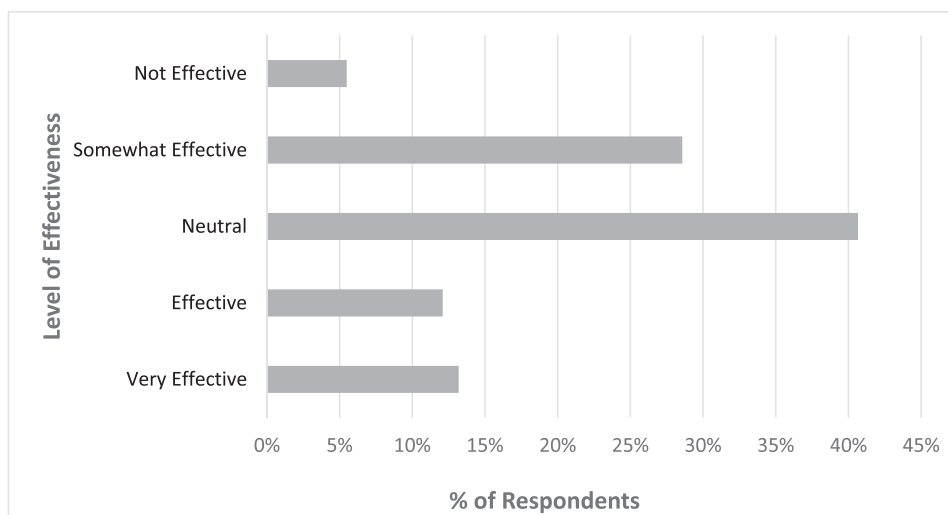


Figure 3.—Effectiveness of social media as a marketing strategy among US forest products industry respondents.



**Table 3.—Company goals addressed by social media that were recognized by forest products industry survey respondents.**

Company goals	% of respondents
Increase exposure	76.40
Branding	67.42
Lead generation	51.69
Generate goodwill perspective among customers	44.94
Improve sales	44.94
Grow business partnerships	35.96
Customer service	32.58
Reduce marketing expenses	23.60
Direct sales	16.85
Market research	13.48
Product development	11.24

follow the lead of fast-growing companies. These companies are increasingly using social media tools to communicate with their customers, partners, and vendors. In addition, the use of social media by potential consumers is significant and will continue to increase (Sago 2013). It is estimated that there will be around 2.34 billion social network users around the globe in 2016, up from 0.17 billion in 2015 (Statista 2016). The forest products industry can take advantage of this trend in its marketing strategies if it wishes to expand its customer base and maintain its current relationship with existing customers. Customer relationships are essential for success among B2B firms and the use of social media will be even more critical. The relevance of long-term relationships with customers among B2B companies makes customers a critical financial asset for these companies (Senn et al. 2013). Social media can be an important tool to enhance this customer relationship. This means that the forest products industry needs to make significant investments in social media marketing, which at the moment is lacking. Statista (2016) reported that spending on social media marketing in the United States totaled approximately \$7.52 billion and is expected to increase by almost \$10 billion to \$17.34 billion in 2019.

Adoption of social media among the US forest products companies is influenced by company characteristics as measured by its resources and capacities (e.g., age, revenue, product types) and company strategies (e.g., e-commerce use, Web site contents and characteristics). This information sheds light to the driving factors behind social media adoption among forest products companies. Companies should have the necessary resources and organizational strategies to adopt social media in marketing.

Many forest products companies in the United States do use social media to promote and advertise their products. These companies are taking a proactive role in adopting social media and not merely jumping on the bandwagon by focusing on increasing exposure, branding, and lead generation in their social media marketing efforts. This is evidence that social media is being implemented as a strategic tool for marketing products (Sinclair and Vogus 2011). In addition, evidence of organizational change as a result of social media adoption supports this; most of the responding companies that had adopted social media reported having a dedicated social media person.

Forest products companies seem to be optimistic about the use of social media and most think that it is an effective marketing tool. No major concerns were expressed regarding potential challenges associated with the adoption of

**Table 4.—Concerns faced by social media adopters and non-adopters among the responding US forest products companies in using social media.**

Concerns	Level of concern (no. of observations) <sup>a</sup>	
	Adopters	Non-adopters
Availability of appropriate technology	2.51 A (92)	2.68 A (65)
Having the staff to manage it	3.15 A (93)	3.50 A (66)
Generating member/customer activity	3.72 A (93)	3.47 A (64)
Creating content to post	3.15 A (92)	3.17 A (65)
Getting members or fans	3.30 A (92)	3.22 A (63)
Generating the return on investment to cover the costs	3.67 A (93)	4.00 B (63)
Understanding the tools and how to use them	2.97 A (92)	3.19 A (64)
Concerns about what community members will post	2.96 A (92)	2.94 A (63)
Concerns about site security	3.10 A (92)	3.38 A (63)

<sup>a</sup> Mean of Likert scale: 1 = not a concern; 2 = somewhat a concern; 3 = neutral; 4 = a concern; 5 = a major concern. Means with different letters across a given row are significantly different at the 10 percent level.

social media except related to their ability to generate the ROI to cover the costs. However, the study also shows that ROI is not being measured by the majority of the companies to evaluate the effectiveness of social media. Instead, other non-dollar metrics (e.g., number of site visits) and qualitative metrics (e.g., audience participation) are used to measure its effectiveness. Although these are important metrics, companies should also have a good handle on ROI and how to measure it, because for any business, the bottom line still matters.

The use of social media has been successful for the businesses of the fastest-growing small companies in the United States (Barnes and Jacobsen 2013) as well as among large global organizations (Sinclair and Vogus 2011). In the context of B2B companies like the forest products industry, social media can be useful in increasing customer engagement, sales and profitability, brand awareness, fostering customer relationships, lead generation, and developing loyalty and reputation (Järvinen et al. 2012, Swani et al. 2014). In general, firms that employ social media seem to be making substantial performance gains. The results of this study indicate that forest products companies in the United States are moving in the right direction with social media adoption and in the ways in which they view social media as a marketing strategy. The information collected from this study can be used in assisting forest products companies in understanding the social media marketing world and in developing an effective social media marketing strategy that includes appropriate measures of program effectiveness.

### Limitations

Although this study provides insights into social media adoption in the forest products industry and provides additional information on the very limited literature on social media use in the industry, organizational factors (e.g., organizational strategy) evaluated in the model may represent a simplistic view of an organization's strategy.

Future studies should evaluate other measures of organizational strategies such as specific marketing strategies, communications strategies, etc., and how these might influence social media adoption. In addition, factors such as organizational governance (e.g., structure), an organization's external environment (e.g., competitiveness), and organizational leadership (e.g., leader's innovativeness, knowledge) have been shown to influence technology adoption (Rahab and Hartono 2012, Nah and Saxton 2013) and may also influence social media adoption, and thus should be evaluated in future work.

Another limitation of this study is the type of data collected during the survey, which limited the type of analysis and model used and therefore brought up some methodological issues. For example, there were several variables that were measured in binary terms; thus, there is too much variance that might not be accounted for in the model. Careful design of the survey instrument is needed to capture additional information to strengthen the quality, validity, and reliability of the study. For example, questions about company characteristics and social media use could be improved by allowing respondents to respond to open-ended questions (i.e., continuous data) rather than limiting them to a few options or expanding the options or choices provided to capture more information. Model constructs that only measure single items need to be re-evaluated to capture other items that might be missing. For example, as mentioned above, there are other measurements for organizational strategy that were not captured by the survey and thus, by the model. This is also true for the variable representing the ease of use of social media, which was only measured by the company's level of concern about social media. Another interesting aspect that could be measured in future studies is the level of social media adoption. Currently, the study only looks at whether companies adopt social media or not but does not take into account the level of involvement in social media, which might be affected by other factors. In addition, because of the nature of the data collected, the model developed mainly focused on the main effects and failed to evaluate possible interactions of the independent variables as to how they influence adoption of social media. Including interactions in the model would allow us to evaluate how a factor affects social media adoption change on the basis of certain characteristics of the firm or any other relevant independent variable.

### Acknowledgments

The work upon which this publication is based was funded in part through the USDA Forest Service, Northern Research Station, Princeton, West Virginia (USDA Forest Service Agreement: 12-JV-11242301-113).

### Literature Cited

Adobe Systems Incorporated. 2012. Why marketers aren't giving social media the credit it deserves. *Adobe Digital Index Report*. <http://success.adobe.com>. Accessed January 14, 2015.

Alderete, M. V. and L. H. Gutierrez. 2014. Drivers of information and communication technologies adoption in Colombian services firms. *Int. J. Bus. Inf. Syst.* 17(4):373–397.

American Forest & Paper Association. 2012. State industry economic impact—West Virginia. <http://www.afandpa.org/docs/default-source/default-document-library/west-virginia.pdf>. Accessed November 2014.

Arano, K. G. and B. Spong. 2012. Electronic commerce adoption in the hardwood industry. *J. Extension* 50(6):6HRIB4.

Arno, C. 2014. Is it possible to measure social media ROI? Incisive Interactive Marketing LLC. <http://clickz.com>. Accessed January 14, 2015.

Barnes, N. G. and S. Jacobsen. 2013. Adoption of social media by fast-growing companies: Innovation among the Inc. 500. *J. Mark. Dev. Compet.* 7(1):11–17.

Blanchard, O. 2011. Social Media ROI: Managing and Measuring Social Media Efforts in Your Organization. Que Publishing, Indianapolis, Indiana.

Boyd, D. M. and N. B. Ellison. 2008. Social network sites: Definition, history and scholarship. *J. Comput.-Mediated Commun.* 13:210–230.

Brennan, R. and R. Croft. 2012. The use of social media in B2B marketing and branding: An exploratory study. *J. Cust. Behav.* 11(2):101–115.

Buehrer, R. E., S. Senecal, and E. B. Pullins. 2005. Sales force technology usage—Reasons, barriers, and support: An exploratory investigation. *Ind. Mark. Manag.* 34:389–398.

Buss, O. and G. Begorgis. 2015. The impact of social media as a customer relationship management tool: A B2B perspective. <http://www.diva-portal.org/smash/get/diva2:821090/FULLTEXT01.pdf>. Accessed January 14, 2015.

Chase L. and K. Knebl. 2011. The Social Media Sales Revolution: The New Rules for Finding Customers, Building Relationships, and Closing More Sales through Online Networking. McGraw-Hill, New York. 239 pp.

Chikandiwa, S. T., E. Contogiannis, and E. Jembre. 2013. The adoption of social media marketing in South African banks. *Eur. Bus. Rev.* 25(4):365–381.

Corder, K. 2001. Acquiring new technology: Comparing nonprofit and public sector agencies. *Admin. Soc.* 33:194–219.

Dahnil, M. I., K. M. Marzuki, J. Langgat, and F. Z. Fabeil. 2014. Factors influencing SMEs adoption of social media marketing. *Procedia Soc. Behav. Sci.* 148:119–126.

Das, S. and K. Das. 2012. Factors influencing the information technology adoption of micro, small and medium enterprises (MSME): An empirical study. *Int. J. Eng. Res. Appl.* 2(3):2493–2498.

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13(3):319–339.

Dillman, D. 2000. Mail and Internet Surveys: The Tailored Design Method. John Wiley & Sons, Inc., New York. 464 pp.

Durkin, M., P. McGowan, and N. McKeown. 2013. Exploring social media adoption in small to medium-sized enterprises in Ireland. *J. Small Bus. Enterp. Dev.* 20(4):716–734.

Felzensztein, C. and E. Gimmon. 2008. Industrial clusters and social networking for enhancing inter-firm cooperation: The case of natural resources-based industries in Chile. *J. Bus Market Manag.* 2(4):187–202.

Georgiou, C. J. and P. S. Stefaneas. 2002. Strategies for accelerating the worldwide adoption of e-commerce. *Commun. ACM* 45(4):145–151.

Ghobakhloo, M., T. S. Hong, M. S. Sabouri, and N. Zulkifli. 2012. Strategies for successful information technology adoption in small and medium-sized enterprises. *Information* 3:36–67.

Grainger, J. 2010. Social media and the fortune 500: How the fortune 500 uses, perceives and measures social media as a marketing tool. Master's thesis. University of North Carolina at Chapel Hill. 98 pp.

Hackler, D. and G. D. Saxton. 2007. The strategic use of information technology by nonprofit organizations: Increasing capacity and untapped potential. *Public Admin. Rev.* 67:474–487.

Hewitt, R., T. Sowlati, and J. C. Paradi. 2011. Information technology adoption in US and Canadian forest products industries. *Forest Prod. J.* 61(2):161–169.

Hoffman, D. L. and M. Fodor. 2010. Can you measure the ROI of your social media marketing? *MIT Sloan Manag. Rev.* 52(1):41–49.

Hollenstein, H. 2004. Determinants of the adoption of information and communication technologies (ICT): An empirical analysis based on firm-level data for the Swiss business sector. *Struct. Change Econ. Dyn.* 15:315–342.

Järvinen, J., A. Tollinen, H. Karjaluo, and C. Jayawardhena. 2012. Digital and social media marketing usage in B2B industrial section. *Mark. Manag. J.* 22(2):102–117.

Jussila, J. J., H. Karkkainen, and H. Aramo-Immonen. 2014. Social

- media utilization in business-to-business relationships of technology industry firms. *Comput. Hum. Behav.* 30:606–613.
- Kalish, S. 1985. A new product adoption model with price, advertising, and uncertainty. *Manag. Sci.* 31(12):1569–1585.
- Karkkainen, H., J. Jussila, and J. Vaisanen. 2010. Social media use and potential in business-to-business companies' innovation. In: Proceedings of the 14th International Academic MindTrek Conference: Envisioning Future Media Environments, New York. pp. 228–236.
- Katona, A. M. and M. Sarvary. 2014. Maersk line: B2B social media—"It's communication, not marketing." *Calif. Manag. Rev.* 56(3):142–156.
- Kozak, R. A. 2002. Internet readiness and e-business adoption of Canadian value-added wood producers. *Forestry Chron.* 78(2):296–305.
- Kropczynski, J. and S. Nah. 2011. Virtually networked housing movement: Hyperlink network structure of housing social movement organizations. *New Media Soc.* 13:689–703.
- Lagrosen, S. O. and K. Grunden. 2014. Social media marketing in the wellness industry. *TQM J.* 26(3):253–260.
- Lebherz, P. R. 2011. Relevant factors for the impact of social media marketing strategies: Empirical study of the internet travel sector. Bachelor's thesis. Karlsruhe Institut für Technologie. 119 pp.
- Leek, S. and G. Christodoulides. 2011. A literature review and future agenda for B2B branding: Challenges of branding in a B2B context. *Ind. Mark. Manag.* 40(6):830–837.
- Lin, I. F. and N. C. Schaeffer. 1995. Using survey participants to estimate the impact of nonparticipation. *Public Opin. Q.* 2:236–258.
- Lorenzo-Romero, C., M. Alarcón-del-Amo, and E. Constantinides. 2014. Determinants of use of social media in retailing sector. *J. Theor. Appl. Electron. Comm. Res.* 9(1):44–55.
- Mandal, D. and R. J. McQueen. 2012. Extending UTAUT to explain social media adoption by microbusinesses. *Int. J. Manag. Inf. Technol.* 4(4):1–11.
- Michaelidou, N, N. F. Siamagka, and G. Christodoulides. 2011. Usage, barriers and measurements of social media marketing: An exploratory investigation of small and medium B2B brands. *Ind. Mark. Manag.* 40:1153–1159.
- Miller, R. and N. Lammas. 2010. Social media and its implications for viral marketing. *Asia Pac. Rel. J.* 11(1):1–9.
- Mitchell, P., J. King, and J. Reast. 2001. Brand values related to industrial products. *Ind. Mark. Manag.* 30:415–425.
- Montague, I. 2011. Social network media in the forest products industry: A look at a new way of marketing. In: Proceedings of the 3rd International Conference on Hardwood Processing, October 16–18, 2011, Blacksburg, Virginia; Virginia Polytechnic Institute and State University, Blacksburg. pp. 235–241.
- Montague, I., K. A. Gazal, J. Wiedenbeck, and J.-G. Shepherd. 2016. Forest products industry in a digital age: A look at e-commerce and social media. *Forest Prod. J.* 66(1/2):49–57.
- Nah, S. and G. Saxton. 2013. Modeling the adoption and use of social media by nonprofit organizations. *New Media Soc.* 15(2):294–313.
- Neff, J. 2010. What happens when Facebook trumps your brand site? *Advert. Age* 81(30):2–22.
- O'Reilly, T. 2005. What is web 2.0? Design patterns and business models for the next generation of software. <http://orielly.com/web2/archive/what-is-web20.html>. Accessed January 13, 2014.
- Oztamur, D. and I. S. Karakadilar. 2014. Exploring the role of social media for SMEs: A new marketing strategy tool for the firm performance perspective. *Procedia Soc. Behav. Sci.* 150:511–520.
- Palmer, A. and N. Koenig-Lewis. 2009. An experiential, social network-based approach to direct marketing. *Direct Mark. Int. J.* 3(3):162–176.
- Paniagua J. and J. Sapena. 2014. Business performance and social media: Love or hate? *Bus. Horizons* 57:719–728.
- Pindyck, R. S. and D. L. Rubinfeld. 1981. *Econometric Models and Economic Forecasts*. 2nd ed. McGraw-Hill, New York.
- Porter, M. E. and V. A. Millar. 1985. How information gives you competitive advantage. *Harv. Bus. Rev.* 63(4):149–160.
- Pradiptarini, C. 2011. Social media marketing: Measuring its effectiveness and identifying the target market. *UW-L J. Undergrad. Res.* 65:1–11.
- Rahab and J. Hartono. 2012. Adoption of information technology on small businesses: The role of environment, organizational and leader determinant. *Int. J. Bus. Hum. Technol.* 2(4):60–66.
- Rogers, E. M. 1995. *Diffusion of Innovations*, 4th ed. The Free Press, New York.
- Sago, B. 2013. Factors influencing social media adoption and frequency of use: An examination of Facebook, Twitter, Pinterest and Google+. *Int. J. Bus. Comm.* 3(1):1–14.
- Salmeron, J. L. and S. Bueno. 2006. An information technologies and information systems industry-based classification in small and medium-sized enterprises. An institutional view. *Eur. J. Oper. Res.* 173(3):1012–1025.
- Senn, C., A. Thomas, and G. S. Yip. 2013. Customer-centric leadership: How to manage strategic customer assets in B2B markets. *Calif. Manag. Rev.* 55(3):27–59.
- Shook, S. R., Y. Zhang, R. Braden, and J. Baldrige. 2002. The use of eBusiness in the Pacific Northwest secondary forest products industry. *Forest Prod. J.* 52(1):59–66.
- Sinclair, J. K. and C. E. Vogus. 2011. Adoption of social networking sites: An exploratory adaptive structuration perspective for global organizations. *Inf. Technol. Manag.* 12:293–314.
- Statista. 2016. Statistics and market data on social media and user-generated content. <http://statista.com>. Accessed August 4, 2016.
- Stennes, B., C. Stonestreet, B. Wilson, and S. Wang. 2006. E-technology adoption by value-added wood processors in British Columbia. *Forest Prod. J.* 56(5):24–28.
- Swani, K., B. P. Brown, and G. R. Milne. 2014. Should tweets differ for B2B and B2C? An analysis of fortune 500 companies' Twitter communications. *Ind. Mark. Manag.* 43:873–881.
- Thackeray R., B. L. Neiger, A. K. Smith, and S. B. Van Wagenen. 2012. Adoption and use of social media among public health departments. *BMC Pub. Health* 12:242–247.
- Trusov, M., R. E. Bucklin, and K. H. Pauwels. 2009. Effects of word-of-mouth versus traditional marketing: Findings from an Internet social networking site. *J. Mark.* 73(5):90–102.
- Vaynerchuk, G. 2011. *The Thank You Economy*. HarperCollins, New York. 256 pp.
- Venkatesh, V. and F. D. Davis. 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Manag. Sci.* 46(2):186–204.
- Venkatesh, V., M. G. Morris, G. B. Davis, and F. D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS Q.* 27:425–478.
- Verheyden, M. and K. Goeman. 2013. Does (company) size matter? Differences in social media usage for business purposes. *J. Appl. Quant. Methods* 8(4):3–16.
- Vlosky, R. P. and T. Smith. 2003. eBusiness in the U.S. hardwood lumber industry. *Forest Prod. J.* 53(5):21–29.
- Vlosky, R. P., T. Westbrook, and K. Poku. 2002. An exploratory study of Internet adoption by primary wood product manufacturers in the Western United States. *Forest Prod. J.* 56(2):35–42.
- Yee, K. J. and R. Yazdanifard. 2013. The review of the most recent new technologies that changed the face of marketing drastically. *Int. J. Econ. Manag. Soc. Sci.* 2(10):820–823.
- Yildiz, O., O. C. Bozkurt, A. Kalkan, and A. Ayci. 2013. The relationships between technological investment, firm size, firm age and the growth rate of innovational performance. *Procedia Soc. Behav. Sci.* 99:590–599.
- Zorn, T. E., A. J. Flanagan, and M. D. Shoham. 2011. Institutional and noninstitutional influences on information and communication technology adoption and use among nonprofit organizations. *Hum. Commun. Res.* 37:1–33.