

SOCIAL MEDIA USAGE AND RELATIONSHIP TO REVENUE AMONG TECHNOLOGY FIRMS

Katherine Taken Smith, Texas A&M University-Corpus Christi
Karen A. Loveland, Texas A&M University-Corpus Christi
Lawrence Murphy Smith, Texas A&M University-Corpus Christi

ABSTRACT

Prior research indicates that a business firm benefits when it includes social media in the firm's marketing mix. Social media links a firm to consumers, investors, workers, suppliers, lenders, and other stakeholders. Social media platforms range from older platforms, such as Facebook and Twitter, to more recent platforms, such as Google+ and Instagram. Identifying the social networking sites that are most beneficial to a firm and its customers can be a challenge. The present study empirically analyzes the use of social media by major technology firms to determine which platforms the firms use and whether use varies according to company size (total revenue). Results will be of meaningful to business leaders and firm managers in the technology industry, as well as to academicians who study the effect of emerging technologies, specifically social media, on technology firms. From an ethical perspective, firms must disseminate information that is dependable and correct; social media provides an efficient means for firms to distribute information to customers, investors, and others.

INTRODUCTION

Research studies show that a business firm receives benefits when social media is part of the firm's marketing mix. Over recent years, a steady rise has occurred in blogs, posts, tweets, and other uses of social media. Social media links the firm to consumers, investors, workers, suppliers, lenders, and other stakeholders. Social media platforms used range from older platforms, such as Facebook and Twitter, to more recent platforms, such as Google+ and Instagram. Identifying the social networking sites that are most beneficial to a firm and its customers is a challenge to effective business operations. Since consumer preferences and requirements are diverse and constantly evolving, most business firms, including technology firms, make use of multiple social media platforms in firm operations.

The present study empirically analyzes the use of social media by major technology firms. The objectives of the study are (1) to identify the social media platforms used by major technology firms and (2) to determine whether that use varies according to company size (total revenue). Results will be meaningful to business leaders and firm managers in the technology industry, as well as to academicians who study the effect of emerging technologies, specifically social media, on technology firms. From an ethical perspective, firms must disseminate information that is dependable and correct; social media provides an efficient means for firms to distribute information to customers, investors, and others.

Firm managers in the technology sector should assess the extent to which customers use social media to share their views regarding firms and products. Prior research indicates that social media use has enlarged the Internet to become not only a source of information but also a

source of influence (Smith et al., 2015). Over three-fourths of firms make use of social media to achieve business objectives (Alexander, 2011). This rise in social media use is projected to continue (Weinberg & Pehlivan, 2011; Barnes, 2010; Harris & Rae, 2009). In some settings, social media could become the primary way in which firms interact with customers (Baird & Parasnis, 2011).

No previous study has empirically analyzed social media usage by technology firms. This study uses the empirical methodology employed in prior academic studies, such as social media usage by energy companies (Chamberlain et al., 2019a), hospitals (cf., Smith, 2017) and professional accounting firms (Chamberlain et al., 2019b), to analyze social media usage by large, publicly-traded technology firms. Findings will contribute to the academic literature pertaining to social media usage.

The results of this study should be of interest to managers and industry leaders in the technology sector, as well as to academic researchers concerned with the effect of new technologies, specifically social media, on technology firms. A clearer grasp of the social media platforms employed by technology firms will help technology firm managers select the social media platforms that are more beneficial to their firms and will help academic researchers better understand social media usage in general and its impact on the technology sector in particular.

RESEARCH QUESTIONS

There is expanding use of social media by business firms of all types, including technology firms. Further, social media is widely used by consumers to disseminate information about technology firms and their products and services. Consequently, this study addressed the following three research questions:

- RQ1: What social media platforms do technology firms currently use?*
- RQ2: Is there a significant difference in the use of social media platforms among technology firms?*
- RQ3: Is there a significant difference in total revenue between firms with higher use of social media platforms versus firms with lower use of social media platforms?*

REVIEW OF PRIOR RESEARCH

Social media has become an increasingly important avenue by which business firms interact with consumers. For some firms, there is legitimate worry about the ability to control the information disseminated by consumers on social media, which may or may not always be accurate. In any case, firms should be involved with social media, given that it is an increasingly popular way in which consumers share information about firm products and services (Chamberlain et al., 2019a; Smith & Smith, 2018). Past studies indicate that social media has become a critical ingredient in a firm's marketing mix (Smith et al., 2015; Mangold & Faulds, 2009; Li & Bernoff, 2008). More and more, social media is employed as a marketing tool. Almost 70 percent of Fortune 2000 companies were making use of social media by 2010 (McCorkindale, 2010).

The most obvious reason companies use social media is to communicate with prospects and customers. Prior research has shown that social media has a positive impact on the way consumers view a company and their decision-making related to purchases (e.g., Ali et al.,

2016). Firms have also recognized the value of social media for communicating with other stakeholders. Curley & Noormohamed (2013) explored the use of social media as part of a firm's corporate social responsibility (CSR) program. The authors reported a variety of ways firms use social media to communicate with suppliers and investors. Their research prompted them to state that social media, "is a natural platform for cultivating and instilling . . . corporate messages" (2014, p. 61).

Uyar and Boyar (2015) suggested that social media is an important tool for corporate reporting. Their analysis of publicly traded firms in Turkey found that many firms were underutilizing social media to communicate with stockholders. Another study of large firms in the US (Saxton, 2016) analyzed the impact of Twitter posts on corporate reputation and the nature of stakeholder-originated discussions of CSR activities on social media. He noted that corporate responses to CSR-related posts by the public are also a form of CSR that firms should consider in managing of corporate reputation. Prior research indicates that effectively managing corporate reputation can increase the firm's market value (Smith et al., 2010). In addition, advertising has been used to promote an industry's reputation (Smith et al., 2014). Given the expanding use of social media, advertising there could be increasingly important for this purpose.

Table 1 lists popular social media platforms found on technology firm websites. Twitter is a social platform that allows users to send and receive short, text-based messages known as "tweets." Limited to 140 characters, tweets can be used to send/receive news, follow celebrities and other high-profile people, or communicate with friends. Twitter has become very popular since its launch in 2006 with over 100 million daily active users.

Platform	Description
Twitter	An online social networking service and microblogging service that enables its users to send and read short text-based messages, known as "tweets".
Facebook	An online social networking service in which users may create a personal profile, add other users as friends, and exchange messages, including automatic notifications when they update their profile. Additionally, users may join common-interest user groups, organized by workplace, school or college, or other characteristics.
LinkedIn	A social networking website for people in professional occupations.
YouTube	A video-sharing website, on which users can upload, view and share videos.
Google+	A social networking service. Unlike other social networks which are generally accessed through a single website, Google has described Google+ as a "social layer" consisting of not just a single site, but rather an overarching "layer" which covers many of its online properties.
Instagram	An online photo-sharing and video-sharing service that enables its users to take pictures and short videos and share them on a variety of social networking services, including Facebook or Twitter.
Blog	A blog provides a platform for discussion or informational site.
Pinterest	A site denoted as a visual bookmarking location.

Source: Adapted from Smith et al. (2015).

Facebook is well-established as the world's most extensively used social media platform, with more than 700 million users (Alexander, 2011). More than 700,000 firms operate active pages on Facebook's social media site (Briones et al., 2011). On Facebook, a business firm can

create “business pages” to push their products, services, and brands. Among Internet sites, only Google and YouTube have a higher traffic rank than Facebook (Alexa, 2019).

Facebook enables individuals to create a personal profile, designate other Facebook users as “friends”, and send-and-receive messages. Facebook allows users to share photos, short videos, and links to interesting information they found online. It also allows users to “like” and/or comment on other users’ posts. Users often join mutual-interest user groups, based on workplace, religion, school, hobbies, interests, or other characteristics.

The social networking site LinkedIn is a career-oriented site targeted at professionals. It is essentially an online networking site based on the concept of six degrees of separation. It allows users to designate other users as a contact and allows you to see how they are connected through their network to still other users. Businesses use LinkedIn for recruiting and to share company news with followers.

YouTube provides a platform for video files that users can upload, watch, and share (Smith et al., 2015). The platform has two groups: creators and viewers. Many firms act as creators posting videos related to their products and/or services. Non-affiliated creators may also post content relevant to businesses including product reviews, how-to-use videos, and unboxing videos. Google+ is defined by Google as a “social layer” consisting of not just one site, but as an all-encompassing “layer” that includes many of its online properties such as YouTube and Blogger.

Instagram is a social media site for sharing photographs and short video files. Instagram is owned by Facebook and reaches a somewhat younger demographic. The “Story” feature allows users to post content that is only available for one day making it particularly appealing to companies announcing flash sales or other instant. Blogs are social media platforms in which users can facilitate discussions or provide information. A blog is a social networking site because it enables back-and-forth communication, where visitors can leave comments. A business firm can use a blog to promote its brands (Smith et al., 2015).

Pinterest is a social media site that serves as a visual bookmarking location. The site’s name, Pinterest, is derived from the words “pin” and “interest.” The categories are diverse and extensive, such as art, the Bible, fashion, Star Wars, the American Civil War, WW 2, A.E. van Vogt, William Wallace, Tim Keller, and castles. A Pinterest user sets up “boards” on topics of personal interest, to which “pins” are made (either created new or pinned from other Pinterest boards). Other users can then follow these boards.

Determining social media’s return on investment (ROI) has proven difficult to measure. No consistently accepted performance measure has been developed. For the most part, businesses are not tracking ROI of social media (Briones et al., 2011; Fisher, 2009; Taylor & Kent, 2010; Solis & Breakenridge, 2009). The time and cost to track and analyze social media efforts is problematic. Few firms have the financial and personnel resources to devote to the task. Research by Hitt et al. (2015) indicates that the financial benefit of social media depends on a firm’s ability to obtain and make use of external data.

Each day social media is accessed by billions of people (Hansen et al., 2011). Principally used for sending and receiving information, social media is also a factor in decision-making by consumers. Online messaging can be effective in establishing diverse facets of consumer behavior, such as awareness, attitudes, and purchasing (Mangold & Faulds, 2009; Mangold & Smith, 2011). One research study found that 60 percent of consumers employed social media to create a review or disseminate a previously written review (Johnson, 2011). Another study determined that consumers seek out product reviews found on social media to lower cognitive

costs in buying-related decisions (Liu et al., 2011). In this way, social media provides product and manufacturer information that streamlines the buying decision.

Among Internet websites, social media sites are among the highest trafficked. Alexa, an Amazon company, ranks websites based on a calculation that incorporates average daily visitors with pageviews. In March 2019, Google was the highest ranked website, followed by social media site, Youtube. Facebook ranked third. Twitter ranked 11 and LinkedIn ranked 25. Thus, four social media sites were among the top 25 Internet sites, including the second and third-most visited sites (Alexa, 2019).

Some business firms are making use of social media ‘mission control’ centers to measure and react to social media activity when it occurs (Weinberg & Pehlivan, 2011). The mission control centers are referred to as ‘war rooms.’ In some cases, the control centers are set up to monitor special events. For example, several advertisers associated with Super Bowl 2013, including Oreo and Coca-Cola, established war rooms for the big game to engage in ongoing social media conversations during the game (Chamberlain et al., 2019b).

METHODOLOGY AND RESULTS

The methodology employed in the present study was developed in prior research regarding social media usage (cf., Chamberlain et al., 2019a; Chamberlain et al., 2019b; Smith, 2017). A sample was selected from the major technology-related firms listed in the Fortune 500. The sample comprised 50 major technology firms, for which comprehensive financial information was accessible. While only 50 firms were included in the sample, this sample size matches to other financial-related studies, such as those concerning energy companies, sample size 28 (Chamberlain et al., 2019a); GMO products firms, sample size 30 (Martin et al., 2017); food products firms, sample size 30 (Martin et al., 2016); federal tax rates, sample size 30 (Smith et al., 2011); and multinational corruption, sample size 48 (Okafor et al., 2014). Financial information was retrieved from Yahoo Finance (2018).

Table 2 shows the number of social media platforms used by each firm, along with the firm’s total revenue in the most recent period in which data was accessible. Social media use ranged from a high of seven social media platforms to a low of none.

#	Company	Total Social Media Platforms	Total Revenue (\$ Mill.)
1	Amazon	7	135,987
2	Qualcomm	7	23,554
3	Amphenol	7	6,286
4	Motorola Solutions	7	6,038
5	NetApp	7	5,546
6	Alphabet	6	90,272
7	Oracle	6	37,047
8	Texas Instruments	6	13,370

Table 2
TECHNOLOGY FIRM, SOCIAL MEDIA USAGE, AND
TOTAL REVENUE

#	Company	Total Social Media Platforms	Total Revenue (\$ Mill.)
9	Applied Materials	6	10,825
10	CommScopes Holding	6	4,924
11	Advanced Micro Devices	6	4,272
12	Apple	5	215,639
13	Intel	5	59,387
14	Jabil Circuit	5	18,353
15	Thermo Fisher Scientific	5	18,274
16	Broadcom	5	13,240
17	Micron Technology	5	12,399
18	Xerox	5	10,771
19	eBay	5	8,979
20	salesforce.com	5	6,667
21	NCR	5	6,543
22	Lam Research	5	5,886
23	Nvidia	5	5,010
24	Juniper Networks	5	4,990
25	Intuit	5	4,694
26	Electronic Arts	5	4,396
27	Science Applications International	5	4,315
28	Agilent Technologies	5	4,202
29	CA	5	4,025
30	On Semiconductor	5	3,907
31	IBM	4	79,919
32	Hewlett-Packard Company	4	48,238
33	CDW	4	13,982
34	Cognizant Technology Solutions	4	13,487
35	Western Digital	4	12,994
36	Priceline Group	4	10,743
37	Corning	4	9,390
38	Leidos Holdings	4	7,043
39	Sanmina	4	6,375
40	Harris	4	5,992
41	Adobe Systems	4	5,854
42	Booz Allen Hamilton Holding	4	5,406
43	Amkor Technology	4	3,894
44	Microsoft	3	85,320
45	Cisco Systems	3	49,247
46	Danaher	3	16,882

Table 2
TECHNOLOGY FIRM, SOCIAL MEDIA USAGE, AND
TOTAL REVENUE

#	Company	Total Social Media Platforms	Total Revenue (\$ Mill.)
47	Liberty Interactive	3	10,647
48	Expedia	1	8,774
49	Activision Blizzard	1	6,608
50	Facebook	0	27,638

Data Sources: Fortune (2017). Fortune 500. <http://fortune.com> and Yahoo (2018). Yahoo Finance. <http://finance.yahoo.com>.

Table 3 shows the percent of firms using the different social media sites. Twitter, Facebook, and LinkedIn are the most used, with 98.0 percent of firms using Twitter; 92.0 percent using Facebook; and 86.0 percent using LinkedIn. In addition to these three, other social media sites used include YouTube, Google+, Instagram, Blog, and Pinterest.

Table 3
SOCIAL MEDIA PLATFORMS USED BY
TECHNOLOGY FIRMS

Social Media Platform	% Using
Twitter	98.0
Facebook	92.0
LinkedIn	86.0
YouTube	68.0
Google +	42.0
Instagram	22.0
Blog	22.0
Pinterest	6.0

Table 4 shows the results of the t-test of social media platform usage by technology firms and the assessment of the connection between total revenue and social media platform usage. The technology firms using 6 or more social media platform usage made use of significantly more platforms than firms using 5 or fewer platforms. The average number of social media platforms used by technology firms ranged from 6.5 for the higher-social-media-use firms to 4.2 for the lower-social-media-use firms. Concerning revenue, the technology firms using 6 or more social media platform usage had higher revenue than firms using 5 or fewer platforms. The average total revenue of technology firms ranged from \$30.7 billion for the higher-social-media-use firms to \$21.3 billion for the lower-social-media-use firms, though the difference was not significant. Facebook was omitted from the statistical analysis due to it being a social media company.

Table 4
RESULTS OF T-TEST OF TECHNOLOGY FIRM REVENUE BY
SOCIAL MEDIA USE

Ranked by # Social Media Platforms	Average # Social Media Platforms*	Average Revenue (\$ mill.)**
Firms with 6 or more platforms	6.5	30,738
Firms with 5 or less platforms (Excl. FB)	4.2	21.381
All Firms	4.6	23,565

*T-Test Results, Significant Difference, $p < .000$.
**T-Test Results, No Significant Difference, $p < .263$

SUMMARY AND CONCLUSIONS

This study analyzes the extent of social media platform usage by major publicly traded technology-related firms. Knowledge of which social media platforms are most often used will help technology company managers evaluate which platforms could be the optimum choices for their individual companies. Previous research indicates that firms benefit by making social media part of the firm's marketing mix. Firms are expanding use of blogs, tweets, posts, and other social media activity to interact with customers, suppliers, employees, and others. Social media are useful in promoting a firm's products and services, as well as in enhancing the image of the tech sector in general.

The study focused on three research questions. The first question addressed which social media platforms were most used by technology firms. The results indicate that the three most frequently used platforms are Twitter, Facebook, and LinkedIn. The second question addressed whether there was a significant difference among technology firms regarding use of social media platforms. Findings show that social media platform use differs significantly among firms. The average number of social media platforms used by technology firms ranged from 6.5 for the higher-social-media-use firms to 4.2 for the lower-social-media-use firms. The most social media platforms used, by any firm, was 7 and the least was none.

The third and final research question addressed whether a significant relationship exists between social media platform usage and firm size, based on total revenue. Concerning revenue, the technology firms using 6 or more social media platform usage had higher revenue (though not significantly higher) than firms using 5 or fewer platforms, \$30.7 billion and \$21.3 billion, respectively. Possibly, this was due to larger firms (higher revenue) serving a more diverse customer base. Consequently, firms with more diverse customers, who likely use a wider assortment of social media, would better serve customers by offering them a wider array of social media platforms.

From an ethical perspective, it is critical that firms disseminate information that is dependable and correct; social media provides an efficient means for firms to distribute information to customers, investors, and others. Since the three most widely used social media sites by technology firms are Twitter, Facebook, and LinkedIn, these are logically sites that technology firms should consider using. Use of social media is expected to grow; consequently, social media use by technology firms will likely become increasingly important.

LIMITATIONS AND FUTURE RESEARCH

Limitations of the current study include the time period used and the sample of firms included in the analysis. The current study could be extended in future studies by using a different point in time and a different sample of firms. This study offers a starting point for future longitudinal studies of use of social media by technology firms. The expanding use of social media would make this an appropriate topic for future research.

REFERENCES

- Alexa Internet (2019). *The top 500 sites on the web*. Retrieved 27 March 2019 from <https://www.alexa.com/topsites>.
- Alexander, A. (2011, September 21). Does social media return a positive ROI for businesses? [Infographic]. Retrieved 27 March 2019 from <http://ansonalex.com/infographics/does-social-media-return-a-positive-roi-for-businesses-infographic/>.
- Ali, Z., Shabbir, M. A., Rauf, M., & Hussain, A. (2016). To assess the impact of social media marketing on consumer perception. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(3), 69-77.
- Baird, C.H. & Parasnis, G. (2011). From social media to social customer relationship management. *Strategy & Leadership*, 39(5), 30-37.
- Barnes, N.G. (2010). Tweeting and blogging to the top. *Marketing Research*, 22(1), 8-13.
- Briones, R.L., Kucha, B., Liua, B.F., & Jinb, Y. (2011). Keeping up with the digital age: How the American Red Cross uses social media to build relationships. *Public Relations Review*, 37(1), 37-43.
- Chamberlain, D.; Rudolph, H.; Smith, K.T.; & Smith, L.M. (2019a). Analysis of social media usage and relationship to revenue among major energy companies. *Oil, Gas & Energy Quarterly*, 67(3), 525-538.
- Chamberlain, D.; Rudolph, H.; & Smith, L.M. (2019b). Analysis of social media usage and relationship to firm size and revenue growth among major CPA firms. *Services Marketing Quarterly*, 40(1), forthcoming. Published online 7 January 2019 at <https://doi.org/10.1080/15332969.2018.1514798>.
- Curley, C. B., & Noormohamed, N.A. (2013). Social media marketing effects on corporate social responsibility. *Journal of Business & Economics Research*, 12(1), 61-66.
- Fisher, T. (2009). ROI in social media: A look at the arguments. *Journal of Database Marketing & Customer Strategy Management*, 16(3), 189-195.
- Hansen, D., Shneiderman, B. & Smith, M.A. (2011). *Analyzing social media networks with NodeXL: Insights from a connected world*. Elsevier, Boston.
- Harris, L. & Rae, A. (2009). Social networks: The future of marketing for small business. *Journal of Business Strategy*, 30(5), 24-31.
- Hitt, L., Jin, F., & Wu, L. (2015). Data skills and value of social media: Evidence from large-sample firm value analysis. AIS Electronic Library. Retrieved 27 March 2019 from <http://aisel.aisnet.org/icis2015/proceedings/EconofIS/17>.
- Johnson, D. (2011, October 11). 5 Surprising social media statistics that affect your business. *CBS Money Watch*. Retrieved 27 March 2019 from http://www.cbsnews.com/8301-505143_162-28652590/5-surprising-social-media-statistics-that-affect-your-business/.
- Li, C. & Bernoff, J. (2008). *Groundswell: Winning in a world transformed by social technologies*. Boston: Harvard Business Press.
- Liu, Q., Karahanna, E., & Watson, R.T. (2011). Unveiling user-generated content: Designing websites to best present customer reviews. *Business Horizons*, 54(3), 231-240.
- Mangold, W.G. & Faulds, D.J. (2009). Social media: The new hybrid element of the promotion mix. *Business Horizons*, 52(4), 357-365.
- Mangold, W.G. & Smith, K.T. (2011). Selling to Millennials with online reviews. *Business Horizons*, 55(2), 141-153.
- Martin, H.M., Durr, D, Smith, L.M., Finke, R. a& Cherry, A. (2017). Analysis of GMO food products companies: Financial risks and opportunities in the agriculture industry. *African Journal of Economic and Sustainable Development*, 6(1): 1-17.

- Martin, H., Smith, K.T., & Smith, L.M.. (2016). A financial and public policy analysis of the meat industry. *International Journal of Economics and Accounting*, 7(1): 74-88.
- McCorkindale, T.C. (2010). Can you see the writing on my wall? A content analysis of the Fortune 50's Facebook social networking sites. *Public Relations Journal*, 4(3). Retrieved 27 March 2019 from <http://www.prsa.org/Intelligence/PRJournal/Vol4/No3/>.
- Okafor, C.; Smith, L.; & Ujah, N. (2014). Kleptocracy, nepotism, kakistocracy: Impact of corruption in sub-Saharan African countries. *International Journal of Economics and Accounting*, 5(2): 97-115.
- Saxton, G. D. (2016). CSR, big data, and accounting: Firms' use of social media for CSR-focused reporting, accountability, and reputation gain. York University. Working Paper.
- Solis, B. & Breakenridge, D. (2009). *Putting the Public Back in Public Relations: How Social Media is Reinventing the Aging Business of PR*. FT Press, Upper Saddle River, NJ.
- Smith, K.T. (2017). Hospital marketing and communications via social media. *Services Marketing Quarterly*, 38(3), 187-201.
- Smith, K.T., Blazovich, J., & Smith, L.M. (2015). Social media adoption by corporations: An examination by platform, industry, size, and financial performance. *Academy of Marketing Studies Journal*, 19(2), 127-143.
- Smith, K.T. & Smith, L.M. (2018). Social media usage by CPA firms according to firm services and size. *Journal of Accounting & Finance*, 18(10), 112-126.
- Smith, K.T., Smith, L.M., and Dunbar, S. (2014). Using corporate advertising to improve public perception of energy companies. *Journal of Strategic Marketing*, 22(4): 347-56.
- Smith, K.T., Smith, L.M., and Wang, K. (2010). Does brand management of corporate reputation translate into higher market value? *Journal of Strategic Marketing*, Vol. 18, No. 3 (June): 201-221.
- Smith, L.C., Smith, L.M., and William C. Gruben. (2011). A multinational analysis of tax rates and economic activity. *Journal of International Business Research*, Vol. 10, Special Issue No. 1: 95-113.
- Taylor, M. & Kent, M. (2010). Anticipatory socialization in the use of social media in public relations: A content analysis of PRSA's *Public Relations Tactics*. *Public Relations Review*, 36, 207-214.
- Uyar, A., & Boyar, E. (2015). An investigation into social media usage of publicly traded companies. *Journal of Corporate Accounting & Finance*, 27(1), 71-78.
- Weinberg, B.D. & Pehlivan, E. (2011). Social spending: Managing the social mix. *Business Horizons*, 54, 275-282.
- Yahoo Finance (2018). Financial data for the sample of technology companies. Yahoo. Retrieved 5 January 2018 from finance.yahoo.com.