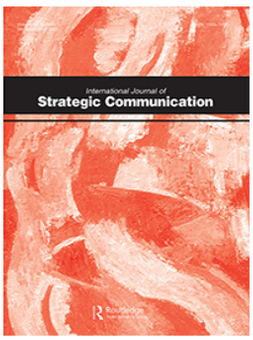

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What to Say and How to Say It? Corporate Strategic Communication through Social Media during the Pandemic

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ABSTRACT

Studying the COVID-19 pandemic differs from past studies on emergency management because this crisis event, compared with the terrorist attack or natural disasters, unfolds in a longer period and with a wider spread of geographic regions. This study explores what and how the information was communicated in the corporate strategic communication through social media across three phases of the global public health crisis, including the early phase, shelter-in-place phase, and reopening phase. The content analysis on corporate Twitter accounts of selected publicly listed firms in the US suggests that corporate social media communication is functional, information-based, direct, and of lower richness during the earlier phase of the pandemic. As the pandemic evolves, corporate tweets, though still functional, are altered to improve customer engagement via the addition of videos and embedded links. For low media richness data formats, the replies/retweet ratio is less than 20%, while high media richness data formats produce the replies/retweet ratio of more than 50%. Implications for future research and practices are offered.

Introduction

The global pandemic injected a sense of urgency for corporations to examine and signal their willingness to take responsible actions by altering various business practices. Based on emergency management literature, modern organizations may use social media to effectively reduce uncertainty and form a collective narrative, especially during a crisis event (Stieglitz et al., 2018). Situational crisis communication theory (SCCT) suggests organizations can protect the public from harm through instructing and adjusting information (Coombs, 2007). Driven by the duties to serve citizens and the public, the government organizations emphasized providing information and guidelines about how to respond to the public health crisis. Likewise, many corporations are prompted to adopt digital tools for communication and coordinate with their key stakeholders and sustain their post-pandemic competitive advantage (Narayandas et al., 2020). However, it is less clear in terms of corporations' responsibility during a public crisis event and hence, there is limited understanding of corporate responses to the global pandemic.

Digital tools, particularly social media, have many advantages for corporations to enhance crisis communication by not only disseminating information quickly but also enhancing openness and wider participation among the general public stakeholders (C. H. Botan & Taylor, 2006; Kaplan & Haenlein, 2006; Heath, 2006). According to the emergency management and communication literature, many government agencies have opened social media accounts for emergency communication

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channels to enable speedy and accurate crisis communication (Kim et al., 2018; Stieglitz et al., 2018). Likewise, social media, including blogs, online communities, and social networking sites, has become a strategic communication tool to enhance user engagement and public relations for many corporations (Ashley & Tuten, 2015; Belasen & Belasen, 2019; Felix et al., 2017; Macnamara & Zerfass, 2012; Tafesse & Wien, 2018). Hence, it is reasonable to expect that if used strategically, social media can greatly enhance a company's communication and sustain its competitive advantage in the event of a global pandemic like the COVID-19.

Studying the COVID-19 pandemic differs from past studies on emergency management because this crisis event, compared with the terrorist attack (Stieglitz et al., 2018) or natural disasters (Kim et al., 2018), unfolds in a longer period and with a wider spread of geographic regions. In the US, several large publicly traded firms demonstrated leadership in providing information and actively engaging users on social media to formulate COVID-19 pandemic-associated corporate responsible responses (Liou, 2020; McDonald, 2020). For instance, AT&T, an internet service provider, utilized social media, its corporate Twitter account, to announce and directly reply to many customers about its plan to waive late fees for those who experienced economic hardship due to COVID-19 (Liou, 2020). Zoom, a video conferencing platform, and Netflix, a media content streaming platform, both quickly capitalized on the trend of remote working and education (McDonald, 2020). Other high-tech companies, built on their core competencies of utilizing technology, also engaged social media users and fine-tuned the companies' corporate socially responsible (CSR) responses. For instance, Facebook founder, Mark Zuckerberg, took the initiative and conducted several interviews with the national health experts discussing the COVID-19 infectious rate and best preventive practices. As such, "the corporate social media account provides an additional social exchange platform for engaging the public in combating rumors and providing a positive outlook in the online community" (Liou, 2020).

Pertinent to the governmental guidelines of physical distancing measures placed to curtail community virus outbreaks (Centers for Disease Control & Prevention, 2020), many individuals and companies turned to social media to stay connected and informed (Chew et al., 2010; Li et al., 2020; Nabity-Grover et al., 2020). Despite the few anecdotal evidence listed above, the researchers do not have a complete understanding of the extent and type of social media communication companies are using during the pandemic. Especially during this unique, unprecedented public health crisis that lasts for a long period, the types and characteristics of information communicated may vary across time. To further enhance our understanding of the social media responses employed by corporations during this pandemic and draw inferences for designing strategic communication plans, we conduct an exploratory study on a sample of nine publicly listed American firms. A detailed content analysis of corporate tweets in the first six months of 2020 is carried out. Built on the emergency management literature, this study attempts to investigate the corporate social media responses in the U.S. during the COVID-19 pandemic crisis and contribute to the strategic communication literature mainly twofold. First, some preliminary studies on the impacts of the COVID-19 pandemic have mainly focused on the impact of the crisis event on the company's financial performance. For instance, Albuquerque et al. (2020) conduct a quantitative analysis of public firms and show that companies with higher ratings on their environmental and social policies have significantly lower stock return volatility. Our study collected qualitative information on these public firms' Twitter responses and provided critical insights on various corporate social responsibilities during the pandemic. Specifically, we join the emergent trend of discussing corporate social responsibility in business research on corporate responses to COVID-19 pandemic (Bapuji et al., 2020; Mahmud et al., 2021) and investigate the types of messages communicated via a seminar framework offered by Carroll's (1999) four types of social responsibilities, including economic, legal, ethical, and philanthropic responsibilities. Second, in the past organizational research, the organizations' responses to crisis events have been linked to stakeholders' perceptions of organizational reputation, learning, and adaptation, as well as financial performance and survival

(Bundy et al., 2017). The findings of the current study suggest corporations do not only respond to crisis events to manage corporate reputations, but also demonstrate important citizenship in various social issues, such as combating disinformation and forming cross-sector partnership.

The rest of the paper is structured as follows. The study begins by providing a literature review on emergency management and corporate social media communication strategy. Next, the authors describe the data collection, sample characteristics, and the number of tweets used for analysis. Following this, the various types of corporate social media responses are identified. Lastly, a discussion on the implications for future research and practices is offered.

Background: COVID-19 pandemic and social media

The impact of the COVID-19 pandemic in the US

The first confirmed case of COVID −19 was reported in the U.S. on January 20, 2020; subsequently, the U.S. declared a national emergency on March 13. To flatten the curve of the community spread of the virus, California was the first state to order all residents to stay at home since March 19 (Mervosh et al., 2020). Several states followed suit and announced shelter-in-place orders and mandated closing all non-essential businesses in April. As such, at least 347 companies have cited Covid-19 as a factor in their decision to file for bankruptcy in 2020, and there were 30 of them from different industries in April (Scigliuzzo et al., 2020). Despite the effort of several fiscal policies and monetary support by the U.S. government, the U.S. economy gravitated towards a downward spiral due to the global supply chain crisis and reduced in-person activities and services. "The U.S. economy lost over 20 million jobs in April with the unemployment rate spiking to 14.7%, the worst since the Great Depression" (Ziv, 2020). Starting in early May, many states in the U.S. gradually transitioned through several phases of reopening plans to relieve the businesses from worsening economic impacts.

Corporate strategic communication responses to the public health crisis

Preliminary research on corporate responses to the 2009 flu pandemic suggests that business organizations emphasized reputation management in their crisis responses, and frequently adopted denial, diminish, and reinforce response strategies (Coombs, 2007; Coombs & Holladay, 2002; Kim & Liu, 2012). Yet, a recent study on stock market performance during the COVID-19 pandemic suggests that corporations with more corporate social responsibility (CSR) activities tend to experience less pandemic-induced drop (Ding, Levine, Lin, & Xie, 2020); environment and society-oriented stocks experienced less return volatility (Albuquerque et al., 2020). Similarly, Huang, Chen, and Nguyen (2020) studied a large sample of Chinse listed firms and found that companies with higher CSR performance before the pandemic experience fewer losses and take a shorter time to recover from this pandemic induced exogenous shock to the stock market. Hence, it is plausible that corporations are more aware of their responsibilities to societal stakeholders in the recent pandemic as well as recognize the financial incentives for corporations to focus on the controllable nature of the business practices and facilitate government organizations' effort in reducing harms during the public health crisis.

COVID-19 presented an unprecedented public health threat because it has spread rapidly around the world in just a few months, while many health officials scrambled to learn more about it (Mack, 2020). Despite the dreaded public health threat and economic impacts of the COVID-19 pandemic, corporations today are blessed with digital tools for communications and coordination. Emergency management literature suggests that social media platforms play an important role in public sense-making (C. Botan & Penchalapadu, 2009) and forming a collective narrative. Social media has provided opportunities for for-profit, governmental, and non-governmental organizations to strategically communicate with the public in times of crisis (Eriksson, 2018). The top three best practices of using social media platforms in risk and crisis communication that had been studied in the literature (Eriksson, 2018) include: 1) developing dialogue and choosing the right message, source, and timing

(e.g., Ott & Theunissen, 2015), 2) performing precrisis work and developing an understanding of the social media logic (e.g., Getchell & Sellnow, 2016), and 3) monitoring public debates (e.g., Johansen et al., 2016). Given a rich body of literature interested in using social media platforms for crisis communication and management exists, few studies had paid attention to how users communicate differently across various phases of a crisis. A study of two terrorist attacks by Stieglitz et al. (2018) reveals that tweet behavior in the early crisis stages is mostly information-based discourse in sharing updates on the crisis event. Later, social media users shift towards a discussion-based discourse to evaluate and reflect on the crisis event, further forming a collective narrative to understand the impact of the crisis event. Following this line of thought, this study investigates the types and characteristics of information given by the corporations during different phases of the crisis management in a public health crisis such as COVID-19 pandemic. Specifically, we analyze the types of messages communicated in line with Carroll's (1999) seminal framework in categorizing social responsibilities and present the following research question.

RQ 1: What information was communicated in the corporate social media responses across different phases of the global public health crisis?

Public engagement refers to a socially situated process, where "societal members co-construct meaning to address social issues, create social capital, and cultivate a fully functioning society" (Ji et al., 2019, p. 89). Social media platforms provided government agencies with an efficient way to disseminate public health information. For instance, a qualitative content analysis of 1,200 tweets from health departments across 12 nations suggested Twitter accounts are actively used to promote awareness of the infectious disease as well as increase public engagement in health screening and seeking treatment (Guidry et al., 2019). Given the purpose of these health officials' social media strategy is to engage in public awareness and education on various diseases, the content of the social media communication is mainly designed to improve public awareness of various health issues and encourage early prevention and treatment.

In the communication literature, corporate social media engagement is commonly conceptualized as the extent to which social media users actively interact with the content posted by corporate social media accounts. To better understand corporate social media strategy to enhance engagement, researchers recently studied a sample of S&P 500 firms' Facebook posting history in 2015 (Ji et al., 2019). The social media engagement was operationalized as the number of "like", "share" and "comments" each corporate post received from Facebook users. This large-scale quantitative study, using data mining techniques, revealed a positive association between the functional traits of the corporate post and social media engagement. The functional interactivity, such as mentioning other organizations, decreases engagement, while vividness, such as using a video instead of only text, of the post is positively related to engagement (Ji et al., 2019). However, during the pandemic, corporations may or may not be in a position to implement a consistent social media strategy due to the disruption of various business operations. For instance, a recent study on Chinese central government agencies' office channel, "Healthy China", on a Chinese social media site, "Sina Weibo", revealed that the media richness, in fact, negatively predicts public engagement (Chen et al., 2020).

Additionally, the richness of the data format used in communication platforms plays a crucial role in user engagement. Many studies (Fleischmann et al., 2020; Guidry et al., 2019) have been done to investigate how a richer data format can reduce ambiguity and improve the effectiveness of communication. Variety data formats, including text, picture/Gif image, embedded link, and video, are used by corporates in their tweets to communicate with their targeted stakeholders. Hence, it is empirically important and theoretically interesting to investigate the following research question.

RQ 2: How was the information communicated via data format and interactivity in the corporate social media responses across different phases of the global public health crisis?

Research methodology

Data collection

The recognizable social media site was created in the late 1990s, and the two most popular social media sites, Facebook and Twitter, came into existence in 2004 and 2006. Since Haiti Earthquake in 2010, a plethora of studies has been interested in using social media data to investigate crisis communication during the time of disasters (Kim & Hastak, 2018). Twitter remains the most popular platform for academic research because its data is accessible via Application Programming Interfaces (API; Ahmed, 2019). Additionally, Martínez-Rojas et al. (2018) reviewed 284 studies that utilize Twitter data to manage emergency situations, and they found that Twitter is an effective tool and offers valuable data for decision-making. To address our research questions, we conducted an exploratory study using corporate Twitter accounts to investigate corporate communication during the pandemic. Following a purposive sampling strategy (Lincoln & Guba, 1985), this study investigates nine large publicly listed U.S. firms which are offering a wide range of goods and services, including consumer products, financial services, and informational technology services. As shown in Table 1, these nine companies were selected based on the representation of the leading firms on the S&P 500 index as well as active social media usage, ranging from P&G's over 200 K followers to Google's 22 million followers.[1] The keywords of "COVID-19" and "coronavirus" were used to filter out irrelevant tweets from corporate Twitter accounts. After removing the "replying to" tweets, our search resulted in a total of 193 originating tweets, ranging from February 25 to June 7, 2020. While P&G has the most tweets (n = 98), Amazon has the largest average number of comments, with 256 comments per tweet. Google appears to have the highest social media engagement, with an average of 816 retweets and an average of 1810 likes per tweet. The data format of the tweets includes text, picture file, embedded link, and video.

Coding process

The temporal dimension of corporate social media responses

During a crisis event, notably the COVID-19 pandemic, the threat to public health drives many corporations to take part in disseminating information to educate customers and others, so the corporations can help them cope with uncertainty. When the first confirmed case was announced in the U.S., corporations did not have much information on the extent of economic impacts, and hence, did not initiate many social media responses. Corporations generated more social media responses as the pandemic ran its course in turning the major cities, including Seattle and New York, into

Table 1. Descriptive statistics of corporate social media responses in Twitter.

Company	Followers	Count of tweets	Sum of Replies	Average of Replies	Sum of Retweets	Average of Retweets	Sum of likes	Average of likes
Amazon	3,300,000	6	1535	255.83	466	77.67	1662	277.00
AT&T	905500	20	562	28.10	821	41.05	1964	98.20
Bank of America	549,900	3	137	45.67	91	30.33	234	78.00
Facebook	13,400,000	9	1250	138.89	696	77.33	1826	202.89
Google	22,000,000	15	1687	112.47	12,240	816.00	27,154	1810.27
Intel	4,800,000	4	68	17.00	652	163.00	1173	293.25
J.P. Morgan	527,200	6	54	9.00	129	21.50	297	49.50
Microsoft	8,900,000	32	504	15.75	4332	135.38	13,469	420.91
P&G	213100	98	435	4.44	1310	13.37	7023	71.66
Total		**193**	**6232**	**32.29**	**20,737**	**107.45**	**54,802**	**283.95**

[1]The data collection in this study was concluded in early June 2020. The number of followers fluctuates daily.

epicenters of community outbreaks. Based on the critical events that have great impacts on businesses, the authors divided the timeline into three phases. First, the *early* phase started when the first case was confirmed in the U.S. on January 20, and ended on March 15, two days after the government announced a national emergency. Second, the *shelter-in-place* phase started from March 16 when the first state in the U.S. announced the "shelter-in-place" order and ended on April 25 when the first state in the U.S. officially kicked off the reopening plans. Third, the *reopening* phase marked a period starting on April 26 when various states in the U.S. are gradually relaxing shut-down measures and companies are opening for business. The data collection ended on *June 8*, which marks the end of the reopening phase in our sampling period.

Information communicated

According to Carroll's (1999) Corporate Social Responsibility (CSR) theory, the corporation has four types of essential social responsibilities: economic, legal, ethical, and philanthropic responsibilities. The *economic responsibility* is to create profit; the *legal responsibility* is to adhere to rules and regulations; the *ethical responsibility* is to do what is right even when not required by the law; and the *philanthropic responsibility* is to contribute to the nonprofit-driven community projects. Therefore, the messages communicated in each corporate's social media account can be categorized into three information categories. For messages related to corporate economic responsibility during the COVID-19 crisis (e.g., promotions, business reopening plans, etc.), we name them "business-related" information; for messages related to the legal and ethical responsibility of the COVID-19 crisis (e.g., COVID-19 regulations, educational information, etc.), we name them "COVID-19 related" information; for messages related to corporate philanthropic responsibility during the COVID-19 crisis (e.g., donations, helps for frontline workers, etc.), we name them "philanthropic" information. To further investigate the information communicated in these messages, three researchers independently coded the data into three information categories, including "COVID-19 related" information, "philanthropic" information, and "business-related" information. Example tweets for each category are provided in Table 2. Cohen's kappa (1960) is frequently used by researchers to measure the agreement between two raters. In our study, the authors used a generalized kappa, the Fleiss' Kappa (Fleiss, 1971), to measure the inter-rater reliability of three researchers' observations. The Fleiss' Kappa score was 0.56, which showed a moderate agreement among researchers for the first iteration of the coding process. The three researchers communicated about their criteria for categorizing the tweets and discussed their rationales in the process of coding. During the second iteration of the coding process, the three researchers independently coded the data again into the three categories. The Fleiss' Kappa score for the second iteration was 0.81, which showed almost perfect agreement among researchers.

Table 2. Content category of tweets and example tweets.

Categories	Example tweets
Covid-19 related information	5 ways to help cope with stress during COVID-19: 1 PAUSE. Breathe. Notice how you feel 2 TAKE BREAKS from COVID-19 content 3 MAKE TIME to sleep & exercise 4 REACH OUT & stay connected 5 SEEK HELP if overwhelmed or unsafe
Philanthropic information	Individuals experiencing homelessness are among the most vulnerable communities to coronavirus. Thanks @globalmedicdmgffor helping our Canada team supply hygiene kits to shelters & food banks as part of their #COVID19 response efforts.
Business-related information	We're all in this together. Just like you, we're closely monitoring the impact of COVID-19. Here are the ways we're supporting customers, employees, and communities during this difficult time:

Data format

Adapted from literature (Chen et al., 2020; Ji et al., 2019), this study utilized four levels of media richness based on the data format used in tweets. A richer format of data will include more informational cues that aid communication (Daft & Lengel, 1984). In the level 0 tweet, the content is text only, whereas the level 1 tweet also includes pictures, photos, and/or gif images. Level 2 tweet utilizes an embedded link to provide relevant information in addition to a text and/or a picture. Level 3 tweet has the highest level of media richness and contains a video in addition to the other levels of data formats that may be included as well.

Social media interactivity

Computer-mediated communication through social media can enrich communication by increasing functional interactivity, defined as "an interface's capacity for conducting a dialogue or information exchange between users and the interface" (Sundar et al., 2010, p. 33). Specifically, interactivity is situated in three central elements of communication, including source, medium, and message (Sundar et al., 2010). The number of hashtags and mentions are often used to measure the social media interactivity in is the information system literature (Ji et al., 2019; Kim et al., 2018) and are adopted in the current study to measure interactivity. The tweets were coded into dummy variables, "Has #hashtag" and "Has @mention."

Research findings on corporate social media communication during the pandemic

What information was communicated across different phases of the pandemic?

As shown in Figure 1[2], the sampled firms rarely tweeted in the *early* phase. The first tweet was posted by P&G on February 25. Figure 2[ii] provides a more detailed look at each corporation's tweet behavior. In the early phase, there were only 7 tweets from 5 different companies, including Facebook, Google, J. P Morgan, Microsoft, and P&G. Despite the low counts of tweets, each corporate tweet has received a high frequency of social media engagement. In the *shelter-in-place* phase, there were a total of 125 tweets, accounting for 65% of the total tweets in the sampling period. All nine companies had posted many tweets during the shelter-in-place phase. Each company has an average of 14 original posts in

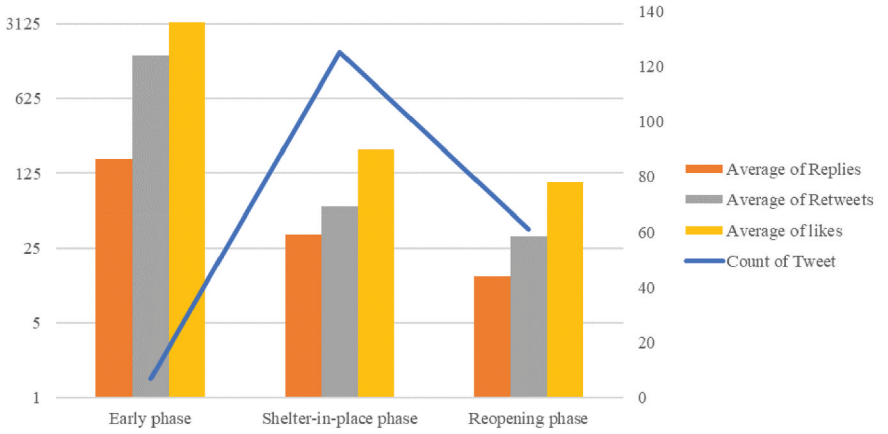

Figure 1. Average tweet behavior in different phases.

[2]The value of the vertical bar chart is illustrated by the left Axis and the value of the line chart is illustrated by the right Axis. Due to the large range of data values, the left Axis has transformed into a 2-base logarithmic scale for display purposes.

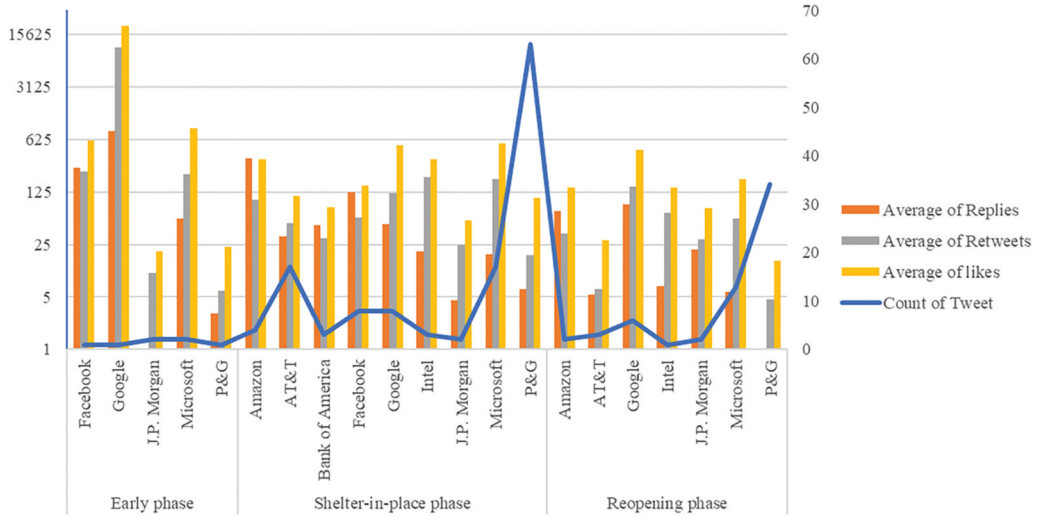

Figure 2. Corporate tweet behavior during the pandemic.

the second phase. At the *reopening* phase, the extent of economic impacts on various businesses is more generally discussed and understood, hence the tweets related to COVID-9 are decreasing, as the focus of media reports is shifted toward other social events such as policing brutality, racial disparity, and social injustice. The frequency of tweets decreased to a total of 61 tweets, and P&G consistently has posted more tweets than other companies in the *reopening* phase. Overall, the authors find that corporations have an increased social media engagement, including the number of tweets, comments, retweets, and likes, in the second phase, and then decrease in the reopening phase.

Information communicated

There are three categories of information communicated through social media, including COVID −19 related information (14%), philanthropic information (55%), and business-related information (31%). As shown in Figure 3, corporations offer more COVID −19 related information in an earlier phase

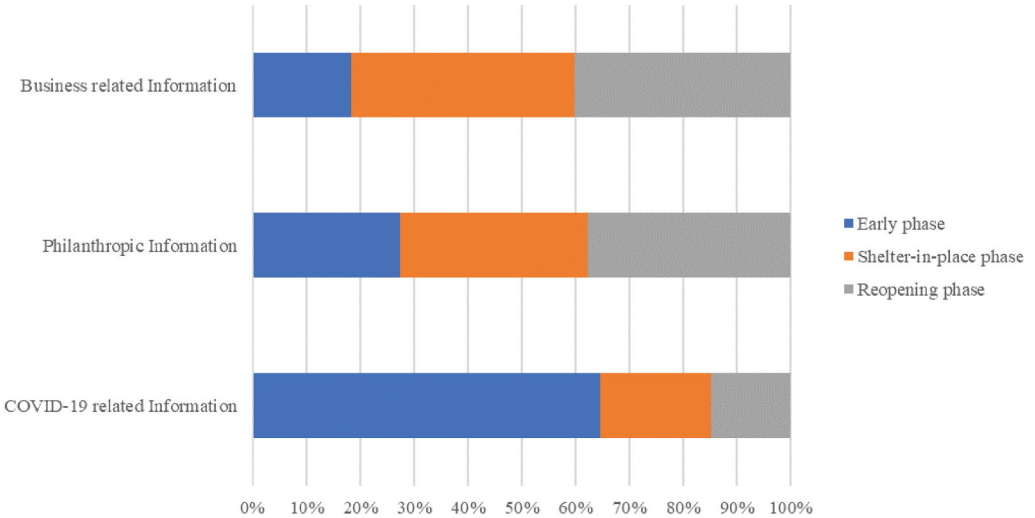

Figure 3. Corporate tweet content across three phases of pandemic.

than the later phase. As for philanthropic and business-related information, the frequency increases in a later phase than an earlier phase. This finding is consistent with the emergency management literature that a more elaborative response is likely to emerge in a later phase of social media discourse (Stieglitz et al., 2018).

As for the business-related information, corporations have a wide variation in addressing their primary stakeholders' concerns. For instance, the U.S. government has provided a guideline of essential vs. non-essential business activities during the "shelter-in-place" phase. For the essential-business, corporations need to deliver information regarding how to run the operations as normal with greater health protection measures. For instance, AT&T has closed all stores, which are considered non-essential business but continued providing in-home installation services, which are considered essential businesses because many individuals need internet services to be able to work or receive education remotely. Hence, business-related information was disseminated through tweets throughout all three phases.

How was the information communicated via social media during the pandemic?

Data format

Social media marketing literature suggests that corporations utilize a richer data format to elicit higher social media users' engagement (Ji et al., 2019), but in the *early* phase, sampling firms often opted for a less rich data format to speed up the communication of information to reduce uncertainty. As shown in Figure 4, in the *early* phase, only text, pictures, and embedded links were used in corporate tweets. The richer data format – video – was largely used in the *shelter-in-place* phase and the *reopening* phases to accomplish higher user engagement. However, there was an exception. On March 14, Google posted a tweet about five simple things to do to help stop coronavirus (COVID-19). This tweet utilized a simple data format of including text with a picture. However, because of the relevancy and great timing, it received over 20k likes and 10k retweets, which resulted in the highest user engagement among all sampled tweets.

The utilization of low media richness (level 0 and level 1) data formats decreased across three pandemic phrases, whereas the utilization of high media richness (level 2 and level 3) data formats increased across three pandemic phrases. Further, the replies/retweets ratio shows the percentage of users that had written comments or participated in the discussion while retweeting the original tweets.

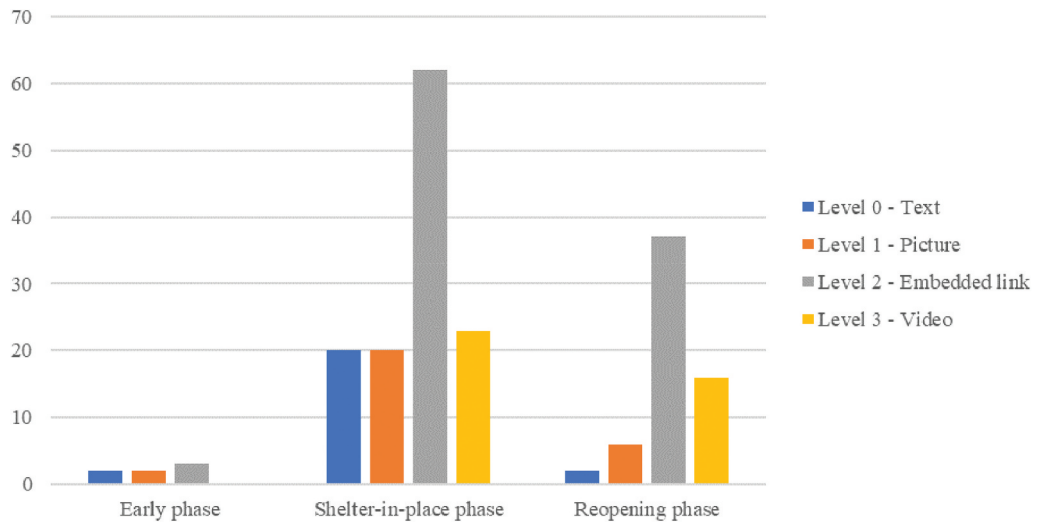

Figure 4. Media richness/Data format used across the three phases of the pandemic.

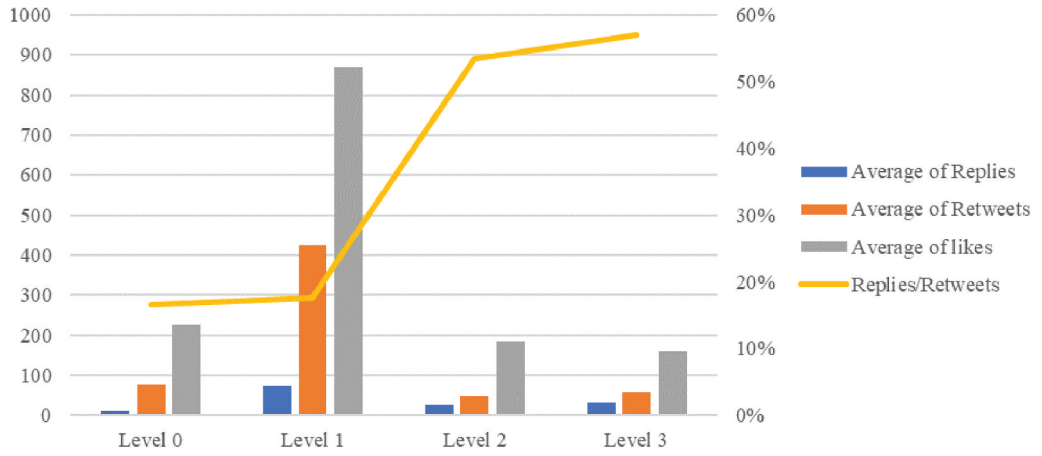

Figure 5. The ratio of tweet replies by retweets across levels of the media richness.

Table 3. Corporate social media interactivity.

Media Richness/Data Type by Corp.	Count of Sr. No.	Has #hashtag	Percentage of hashtag	Has @mention	Percentage of mention
Level 0-Text	**24**	**17**	**71%**	**14**	**58%**
AT&T	1	1	100%	0	0%
Facebook	1	0	0%	1	100%
J.P. Morgan	2	0	0%	0	0%
Microsoft	3	1	33%	0	0%
P&G	17	15	88%	13	76%
Level 1-Picture	**28**	**24**	**86%**	**12**	**43%**
Amazon	1	0	0%	0	0%
AT&T	11	11	100%	4	36%
Google	2	0	0%	0	0%
Microsoft	1	1	100%	0	0%
P&G	13	12	92%	8	62%
Level 2-Embedded link	**102**	**74**	**73%**	**38**	**37%**
Amazon	3	0	0%	2	67%
AT&T	4	4	100%	0	0%
Bank of America	2	0	0%	0	0%
Facebook	3	1	33%	1	33%
Google	7	1	14%	1	14%
Intel	2	0	0%	1	50%
J.P. Morgan	4	1	25%	0	0%
Microsoft	25	17	68%	5	20%
P&G	52	50	96%	28	54%
Level 3-Video	**39**	**25**	**64%**	**16**	**41%**
Amazon	2	0	0%	0	0%
AT&T	4	4	100%	2	50%
Bank of America	1	0	0%	1	100%
Facebook	5	0	0%	1	20%
Google	6	2	33%	2	33%
Intel	2	0	0%	0	0%
Microsoft	3	3	100%	1	33%
P&G	16	16	100%	9	56%
Grand Total	**193**	**140**	**73%**	**80**	**41%**

As shown in Figure 5, the replies/retweet ratio increases as the media richness move to a higher level. For tweets with low media richness, the replies/retweet ratio is less than 20% (17% and 18% for the level 0 tweets and the level 1 tweet, respectively). For the tweets with high media richness, the replies/retweet ratio is more than 50% (54% and 57% for level 2 and the level 3 tweets, respectively).

Social media interactivity

Table 3 shows the frequency of hashtags and mentions utilized across different data formats of tweets by each corporation. The data shows that tweets using picture data formats have the highest percentage of using hashtags (86%), whereas tweets using text data formats have the highest percentage of using mentions (58%). This indicates that corporates tend to increase interactivity, using hashtags and mentions to engage with users when low media richness data formats are used in the tweets.

Discussion and concluding remarks

In this study, the authors examine two research questions that emerge in the context of the ongoing pandemic, namely, "what and how the information was communicated in the corporate social media responses across different phases of the global public health crisis?" Table 4 represents a thematic summary of the findings. The implications of these findings are discussed below.

Implications for research

Though social media has been widely used as a means for distributing corporate information, it also serves as a platform for corporations to interact with their customers (Aula, 2010). Much of the research on social media leads to the conclusion that despite firms' attempts at various creative strategies, most of the social media content can be categorized as functional (Ashley & Tuten, 2015) and meeting certain business-related objectives (Rishika et al., 2013). During the earlier stages of the pandemic, the authors observe that corporate social media communication is functional, information-based, direct, and of lower richness. As the pandemic evolves, this message, albeit still functional, is adapted to improve customer engagement via the inclusion of videos and embedded links and moves to, what has been noted in prior works, the discussion-based period of forming collective narratives (Stieglitz et al., 2018).

Studies have argued that, from the customer perspective, social media communication from the companies can increase consumption (Hong, 2012); the authors argue that this also holds during the pandemic as companies adapt their social media communication. Ashley and Tuten (2015) note the importance of frequent updates, and this strategy is critical during the pandemic as visible and vocal companies are likely to assuage any potential misgivings from the customers. The findings of this study reveal a steady growth of tweets throughout the pandemic, which relates to COVID-19. Other studies have explored the influence of customers' visit frequency (Rishika et al., 2013) and incentives to participate (Ashley & Tuten, 2015) in social media communications. During the pandemic, corporate social media can be utilized to generate donations and address community initiatives through improving visit frequency and incentivizing customers to participate in their corporate social

Table 4. Summary of findings.

Corporate social media communication during the pandemic	
What information was communicated across different phases of the pandemic?	
Social media counts	Corporations tweet more in the later phase than in the early phase
Social media engagement	Corporations have an increasing social media engagement in the later phase than in the early phase
Information communicated	Three categories of info include business-related information, COVID-19 information, and philanthropic information. COVID-19 information was delivered in the early phase; business-related information and philanthropic information were offered in the later phase.
How was the information communicated via social media during the pandemic?	
Data format	In the early phase, corporations usually opt for a less rich data format to speed up the communication of information to reduce uncertainty. The richer data format is used in later phases to accomplish higher user engagement.Higher media richness data format brings higher user engagement.
Social media interactivity	Corporates tend to increase interactivity, using hashtags and mentions to engage with users when low media richness data formats are used in the tweets.

campaigns. For instance, P&G has many notable examples of campaigning for various causes by building partnerships with other corporations and non-profit organizations, such as using the hashtags "ForceForGood" and mentions the non-profit organization, Feeding America. The sampling firms in our study have set great examples of utilizing social media communication for cause-related marketing, which has been shown to enhance a company's sustainable competitive advantage (Wei et al., 2020). Further studies on a larger sample of corporations using multiple social media platforms beyond Twitter may enlighten our understanding of the effectiveness of communication strategies during a public health crisis, such as the COVID-19 pandemic.

Implications on practice

The findings of this study can provide valuable practical implications for corporates database managers as well as social media managers. Database managers can develop a repository of issues and suggestions related to the pandemic raised on their tweeter account by the customers and vendors. In a fast-moving situation like a pandemic, this repository of issues and suggestions can support strategic media planning. Similarly, database managers can generate solutions database to address pandemic related business and customer issues and responses. This solutions database can support frontline staff who have to address the customers' queries. For instance, during the pandemic, Amazon has utilized frontline employees to address customers' complaints of delayed shipment (Liou, 2020). In the future events of a public health crisis, having a streamlined social media communication strategy can help corporations devote their time and resource to other pertinent issues during the pandemic.

In the digital age, many individuals turn to social media for instant updates of a public health crisis. A study conducted on March 21, 2020, showed that "over one-quarter of the most viewed YouTube videos on COVID-contained misleading information (Li et al., 2020.), and the online platforms should have a responsibility to prevent the spread of misinformation (Anoruo, 2020). Based on our observations, seven leading high-tech firms, namely Facebook, Google, LinkedIn, Microsoft, Reddit, Twitter, and YouTube, delivered a joint statement on combating misinformation on March 16.

> "We are working closely together on COVID-19 response efforts. We're helping millions of people stay connected while also jointly combating fraud and misinformation about the virus, elevating authoritative content on our platforms, and sharing critical updates in coordination with government healthcare agencies around the world. We invite other companies to join us as we work to keep our communities healthy and safe."

This multi-corporation partnership sets a great precedent for other companies to follow suit and should be incorporated as part of the corporate social media protocol in the future event of a public health threat or other types of social issues, contributing to positive public engagement.

In addition, social media managers are known to develop creative content that helps communicate the brand image by actively engaging users so that consumers would incorporate the brand into their own stories and identities (Ashley & Tuten, 2015; Sheehan & Marrison, 2009). In the event of a global public health crisis, social media managers might consider adopting a two-pronged approach to message dissemination during the pandemic. Firstly, they need to take an agile approach and use text messages during the earlier stages of the pandemic to spread crisis-related information quickly. Corporations increasingly have the responsibility not only to maximize shareholders' interests but also to enable solutions to address social problems beyond shareholders' immediate financial interests (Wei et al., 2020). During the pandemic, a short-term focus of social responsibility will be for corporations to prioritize the safety and health concerns of the company's primary stakeholders, including employees, suppliers, and customers. Social media managers will need to be attuned to accurate public health information to be able to develop text-based social media content for engagement promptly. Later, in the more evolved stages of a pandemic, social media managers can apply more advanced design and creativity in the social media content development with video and other more data formats with a high level of media richness. For instance, developing social media content highlighting the first

Figure 6. (a-b) Examples of corporate tweets in supporting first responders during the pandemic.

ENDNOTES

responders' effort (shown in Figure 6a and Figure 6b) can help corporations to leverage their social media resources effectively not only to engage corporate users but also to promote a positive societal spirit, which also leads to positive public engagement.

Implications for future research

In this study, the authors examine the social media communication of the nine large publicly listed U.S. firms. Although the sample is small, the diverse firms used in this study are suitable for this exploratory study. Nevertheless, the generalizability of our research can be improved by future studies that explore different types of organizations, for example, public organizations in different country contexts, for example, firms based in the U.K., Japan, Europe, and large emerging markets like China and India. These future studies, extending the findings of our study, can provide more nuanced insights into the social media communication of companies in a different country's context and deliver practical implications for database managers. Many corporations have country-specific, separate corporate social media accounts which may be proven useful to develop a more culturally relevant social media communication in different countries.

Further, the long-term impact of the pandemic through corporate social media communication on corporate performance is not yet to be studied. The authors would recommend future researchers investigating multiple dimensions of corporate performance. Most of the corporate social media strategy to date is studied in the marketing literature and focused on marketing performance measures, such as consumer attitudes towards the brand and increase consumption (Alves et al., 2016). As shown in our study, firms are varying in their social media communication during the pandemic, and notably, there is a difference between the phases of public health crisis and social media communication. Hence, it is pertinent to identify, if any, there is an influence of social media communication during the pandemic and the firm's financial performance in stock prices as well as social performance, such as employee satisfaction and transparency in corporate governance. In addition, the corporate responses to the pandemic have only been studied in the first six months of our sample period. We encourage future studies that take a longitudinal approach to consider various phases of corporate responses to different social issues, such as racial inequality and social justice, and multiple dimensions of corporate performance.

Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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