Up the Ante: Electronic Word of Mouth and its Effects on Firm Reputation and Performance

Abstract. Prior management research on firm reputation has acknowledged the importance of word of mouth (WOM) in influencing key choices made by businesses, as well as by individuals. In recent developments, Internet-based WOM forums aggregate vast amounts of information relevant to firm strategy and operations. For example, online social media communities aggregate information generated by both the firm (i.e. firm-generated content FGC) and users (i.e. user-generated content UGC). We theorize that FGC and UGC generate reputation benefits for a company in the form of two intermediate information mechanisms: information diversity and valence. We first undertake a qualitative content analysis to investigate the extent to which FGC and UGC generate information diversity and valence. We then test the hypothesis that both information diversity and valence increase a firm's financial performance. Our findings show that electronic WOM as transmitted through social media communities enhances a firm's reputation and thereby its performance through both these effects (i.e. embedded information and valence). We thus fully delineate the determinants of 'good reputation' in these social environments. As part of our robustness checks, we also consider the impact of price and quality, the two specific FGC components, on firm performance. Our findings further confirm these relationships.

Keywords: Reputation; Electronic Word of Mouth; Social Media Communities; Information Diversity; Valence; Performance

INTRODUCTION

Social media has been a striking phenomenon in recent years, enabling personal publishing and a fusion of individual 'voices' in an online environment (Howard, 2010; Culnan et al., 2010). As a communication medium it provides firms with the ability to 'speak' to their market, and affords the market agents with the ability to interact with the firm, bringing it to life. The technology advances presented by the social networking and firm sites conciliate the access to massive audiences with the possibility of identifying and establishing regular, direct and customized interactions. The resulting interactions, participation and sharing have led to a number of changes in the way market agents view and use technology as well as provide new innovative methods of selling products and services (Dellarocas, 2003; Spaulding, 2010). These dynamics of information sharing have important implications for phenomena such as reputation risk and social responsibility because they put them in flux (Luca, 2011). As the term 'reputation risk' is generally used to describe potential threats or actual damage to the standing of an organization (Alalwan et al., 2017; Scott and Walsham, 2005; Gaultier-Gaillard and Louisot, 2006), user-generated content (UGC) on social media can pose high risk to a company's reputation.

In this paper, we evaluate how companies interact with social media users by examining online communities, which are usually set up by companies to give 'voice' to their market and address any receiver concerns and engage with interested users and potential customers. As social media is effective due to its two-way communication (individual and media users) (Safko, 2010), any change in the conditions under which this communication is carried out can present a significant source of pressure on reputation given its qualities as a boundary object (Baird and Parasnis, 2011; Pacauskas et al., 2018; Roth et al., 2013; van Iddekinge, et al., 2013). To address the question of how companies can manage this two-way communication, this research explores the outcomes of such communication in the form of two intermediate mechanisms: information diversity and valence. Information diversity and valence aggregate two-way communication and reflect the level of electronic word of mouth (eWOM). Information diversity contributes to the ability of individual market agents to evaluate firm actions with greater access to information and knowledge, whereas valence reflects the positive feelings that an online community generates for the firm (e.g. members trumpets the firm's positive attributes). Information diversity can be understood as the opinions and views of social media users, reflecting their diverse backgrounds and perspectives including views on different attributes of a firm's products (e.g., quantity, quality). Valence is more about the emotions (positive or negative) involved in consuming or using those products and how those emotions are reflected in user reviews and opinions (e.g., pleasure or enjoyment derived from the use of a product or service). Both firm generated content and user generated content are accounted for when measuring information diversity and valence; this means these two information mechanisms aggregate two-way communication and thus capture the full spectrum of ideas and opinions. We assume that information diversity and valence increase the likelihood that individual market agents will evaluate the firm more favorably as they have access to more relevant and diverse information about the firm (Chaiken, 1980; Fernandez, 1991; Wu, 2013; Goh et al., 2013). As a result, the firm's financial performance is also likely to improve. We theorize that reputation benefits provided by an online SM community can be understood better by focusing on those information and knowledge mechanisms that synthesize relevant aspects of a company's behaviors and actions toward external stakeholders. The literature (for instance, Abdallah et al., 2017; Misirlis et al., 2018) lacks a quantification of the value of recurring engagement by social media users (i.e. firms and buyers) (Albuquerque, et al., 2012). We fill this gap in the literature by focusing on an online SM community and quantifying the recurring engagement by the firm and users, thus making a rigorous assessment of social media-based reputation management strategies. Consequently, the aims of our research are as follows:

(1) To examine the conditions under which two-way social media communication is carried out and how it can present a significant source of pressure on firm reputation;
(2) To explore how the outcomes of two-way social media communication are demonstrated in the form of intermediate mechanisms such as information diversity and valence;

(3) To assess how information diversity and valence, as derived from user-generated content (UGC) and firm-generated content (FGC), increase the likelihood that individual market agents will evaluate the firm more favorably; and

(4) To investigate the impact of these social media influences on firm performance.

The rest of the paper is organized as follows. We begin our research by reviewing previous literature on firm reputation and social media. We identify recurring findings and key themes to form the basis of our conceptual framework and the hypotheses. Then, we describe the methodology used, highlighting the choice of the study's control variables and discussing how the data were used. We then present our results and discuss their implications. We finally discuss the study's limitations and draw attention to future areas of research related to this study.

RESEARCH FRAMEWORK

As an online SM community is characterized by content-generation of both the firm and users, we need to examine the nature of these communication modes in order to fully understand the benefits of such online reputation systems. Firm-generated content refers to the information that comes from the firm, which includes the product description information, product promotion advertising, company information and so forth, whereas user-generated content typically refers to evaluations, opinions, and suggestions that come from other users based on their own purchasing or using experience. We can further classify the firm and user contents into two types of information mechanisms: information diversity and valence. Our hypotheses thus examine the extent to which FGC (firm-generated content) and UGC (user-generated content) produce these intermediate information benefits (i.e. information diversity and valence). Information diversity enables an individual member of an online SM community to have more access to the information he needs in evaluating firm actions (it contributes to the ability of individual market agents to evaluate firm actions with greater access to information and knowledge; for example, users' views on a firm's product quality or its performance characteristics). Valence, on the other hand, reflects the positive feelings that an online community generates for the firm (e.g. trumpeting the firm's accomplishments in key product design areas). Per our definition, information diversity measures the heterogeneity of the communication content, and valence indicates the extent of FGC and UGC positivity. We further investigate whether these social media information mechanisms affect a firm's financial performance. Our study's conceptual framework thus builds on the specific information channels of an online social media community.

Firm-generated Content

Traditional reputation management occurred in the form of a business pushing market agents with a message about its product or service, with these agents making minimal impact on the business with their opinions. In a dramatic turnaround, through technology related events, there are now vast opportunities for markets to communicate with the business as well as other users in 'peer-to-peer communication' (Antweiler and Frank, 2004; Jahn and Kunz, 2012). Baird and Parasnis (2011) recognize that instead of managing market agents, the role of the business is to facilitate collaborative experiences and dialogue that different stakeholders value. This means companies must carefully consider how to create a social media experience that is unique to their company, offer stakeholders value and exploit the power of the social community (Godes and Mayzlin, 2009; Nisar et al., 2018). When interacting with users over the Internet, Godes and Mayzlin (2009) suggest effective social media-based communication must consider subtle user engagement and "leaving the sledgehammer approach to product promotion at home." This involves listening to firm stakeholders and providing help and information rather than forcefully advertising at them. In other words, providing key relevant information about the company and its products to social media users is of paramount importance (Parks and Floyd, 1996). To achieve these goals, a firm will need to provide engaging content through its online community and other social networks (Dellarocas, 2006). Engaging content can educate, inform, entertain and inspire, resulting in user advocates (Bouty, 2000; Dellarocas, 2003). This may then involve providing a rich set of information based on a novel set of perspectives. For example, users may be looking for new product information or want to know more about a company's relationship with its suppliers concerning ethical trading standards or other topical matters (Tam and Ho, 2005). It is therefore likely that FGC (firm generated content) will provide extensive and diverse information to the community as only through this will users engage with the firm**.** Our first hypothesis states this assumption in the following terms:

Hypothesis 1: In an online SM community, FGC leads toward an increase in information diversity.

Furthermore, as firms pursue users' participation at online communities, they constantly face the need for generating absorbing content. In doing so, they are challenged to further build their online community services, reinforcing their meanings and creating new ones (Kamboj et al., 2018; Crandall et al., 2008). As a consequence, we expect that users enjoy more opportunities to feel identified and emotionally bonded to firm name and its products. One can then argue that FGC can easily influence valence in a social media community by giving users positive information about its strategy and operations. The literature on persuasive advertising (von der Fehr and Stevik 1998; Tam and Ho, 2005) argues that firms can design messages that highlight the positivity of products to enhance market evaluations. In this way, one can instil a sense of positive feeling in users about the company and its products (Lee and Hong, 2016; Schubert and Ginsburg, 2000). Similarly, to create a favorable product image, firms may embed their positive statements in the messages that they direct toward the community members. However, Hsiao and Chiou (2012) state how UGC (user generated content) means users can see honest representations of products by consumers who have already used them. Antweiler and Frank (2004) find users prefer to read eWOM reviews over company advertising as they trust the viewpoint of the user who is not linked to the company; they have no reason to lie in the review so can be trusted to give an honest opinion (Akhter et al., 2017). Finally, Lee et al. (2008) find valence is not the sole influencer of consumer decision-making; negative reviews that are of a higher quality have a greater impact over lower-quality negative reviews. As a result, people may weigh negative online reviews more than positive reviews (Ren, Harper and Drenner, 2012). It can therefore be argued that FGC may not be very effective in influencing valence in an online community. People have developed a general tendency to disbelieve or be sceptical toward marketing messages (Ren, Harper and Drenner, 2012), which means that FGC may exhibit a weaker persuasive effect than that of UGC. In light of this, our next set of hypotheses are presented below:

Hypothesis 2A (Competing): In an online SM community, FGC positively influences valence.

Hypothesis 2B (competing): In an online SM community, FGC has no measureable impact on valence.

User-generated Content

The theory of social influence suggests that the individual decision-making process is affected by the views/opinions of those around them (Hsiao and Chiou, 2012; Cropanzano and Mitchell, 2005; Tiwana and Bush, 2000). Prior studies on social media also suggest that individuals and communities use social media to obtain different perspectives on purchases (Duan and Whinston, 2008). In an age of easily accessible communication, buyers want to ensure near perfect satisfaction from purchases. They use social media as a means of getting maximum information, be it from their friends on a social networking site, an online forum or review sites. Moreover, it has been shown that individuals like to inform others about purchases and will review a producer if they have a connection to it, whether good or bad (Crandall, et al., 2008). Indeed, according to Duan and Whinston (2008), social media can give users more comprehensive information than any other source. The potential of user-generated content is facilitated by the exponential growth in cyberspace (virtual) interactions through online communities and other social networking tools. These platforms have empowered users to collaborate, share information, create and develop user-generated contents, thereby voicing their opinions toward the firm and its products and services (Chen and Xie, 2008). The diverse knowledge that is created not only benefit all individual members but also strengthen their positions to provide inputs to the firm's decision-making. We thus state our next hypothesis below:

Hypothesis 3: In an online SM community, UGC leads toward an increase in information diversity.

When people come into contact with a company (by either receiving the company's products or services or reading its literature), they may express their opinions and sentiments about that company or its products or services (Ghose and Ipeirotis, 2011). If they are members of an online community, they are likely to share and relate their product experience with other members. They may exhibit favorable attitudes and sentiments if their experience of the product or attachment to the company's policies has been satisfying. The converse may also be true if they have found something troubling about that company or its products and services. If their experience was not positive, or they dislike any aspect of the company's policies, they may exhibit negative attitudes and sentiments. These general evaluations of a company or its products and services can be referred to as valence embedded in UGC (user generated content) (Sylvain and Nantel, 2004). One may argue that positive valence of UGC should drive consumer purchases (Spaulding, 2010). The combined knowledge in these situations empowers all participants to generate their own solutions, to make argument, adjustments and, thus, to further contribute to the development of the threads. Kurikko and Tuominen (2012) argue that the collective knowledge of the group will be related to the positive feelings associated with a sense of empowerment. Individual users can easily group with like-minded others in order to create social pressure on the firm, and request the firm to join the conversation online. Buyers of Amazon, Tide.com, eToys are grouped and communicated with each other in users-managed online communities to pressure the organizations to change the decisions that they perceived as unethical or unfair. This leads us to formulate our next hypothesis in the following terms:

Hypothesis 4: In an online social media community, UGC leads toward an increase in valence.

Performance Effects of online SM Communities

Impact of social media on firm performance is still relatively unexplored area, especially differentiating the FGC and UGC (Shiau, Dwivedi and Yang, 2017; Shiau, Dwivdei and Lai, 2018). There is no systematic study examining the explicit differences using these two social media contents. There are also studies that use primary survey data to prove that UGC leads to brand loyaly (for instance, Kamboj et al., 2018) or social media advertisement leading to intention to use (Lee and Hong, 2018) but not focusing on causal relationship with financial performances. An analysis of social media activity and their impact over a period of time is also needed (Alalwan et al., 2017; Dwivedi, Kapoor and Chen, 2015; Kapoor et al., 2018). The extant literature reviews highlight that content extracted from social media platforms should be used by future studies (Misirlis and Vlachopoulou, 2018).

The reputation functions by reducing stakeholder uncertainty about the value of future exchanges. It is thus likely that a favorable reputation will induce buyers to engage in repeated purchases (Rao et al., 2001; Shapiro, 1982). This relationship can be tested by further examining the link between user behavior and company reputation: for example, whether reputation induces buyers to purchase from the company with an online community that he or she is a member of (e.g. Roberts and Dowling, 2002). A company's reputation that serves as a quality promise for customers may drive this association. Extending and improving relationships is one of the key principles of social media networks (Porter and Donthu, 2008). Furthermore, positive word of mouth can contribute to an increase in product demand and company profitability (Schubert and Ginsburg, 2000). Dellarocas (2003) mentions different motives for WOM, and 'helping the company' is one of them. As noted by Dellarocas (2003) in the context of buyer satisfaction, the question that really matters is whether a buyer will recommend the firm or not. Positive WOM can lead more customers to choose a particular firm in the future. Due to their non-transactional nature, social networks are particularly suited for collecting information and obtaining feedback from customers. The social media brand community's influence has thus been termed the 'ripple effect' of eWOM (Blanchard, 2008); creating a 'buzz' about a company or product as more community members discuss it, and therefore affecting decision-making (Porter and Donthu, 2008). Hence, we posit that the impact of valence, similar to that of information diversity, positively influences market agents' behavior. We can thus hypothesize:

Hypothesis 5A. Information diversity generated by an online SM community results in improvements in the firm's financial performance.

Hypothesis 5B. Valence generated by an online SM community results in improvements in the firm's financial performance.

Our conceptual model is underpinned by the assumption that a firm's reputation is influenced by both firm-generated content and user-generated content in an online SM community. Through two intermediate information and knowledge mechanisms - information diversity and valence – FGC and UGC provide reputation benefits to the firm as they synthesize information about company behaviors, intentions, and actions (Chaiken, 1980). As presented in Figure 1, the model includes two antecedents and two consequences of a firm's reputation on social media. The model suggests that FGC and CGC produce reputation benefits in the form of information diversity, and valence and that a firm's reputation influences its payoffs. This payoff is measured in terms of the firm's financial performance; it is a subjective measure of how well a firm can use assets from its primary mode of business. There can be a variety of ways of measuring financial performance. In this study, we employ monthly financial performance data on revenue growth and test the performance hypothesis (we also use the number of UGC and FGC shared by the members of the online SM community as another measure of performance; see the empirical section for more information about both these performance measures). As defined above, information diversity measures the heterogeneity of the communication content, and valence indicates the extent of FGC and UGC positivity. The assumption is that both these information mechanisms help users to evaluate firm activities more favorably. As Fernandez (1991) has argued, information mechanisms are often bundled together in theoretical arguments. Following firm reputation related literature (Rindova et al., 2005), we assume firm behavior-related antecedents and consequences of reputation, where "the more favorable general estimation the public has of an entity (individual, organization etc.), the more positive the impact of the public's attitude, actions and behavior on that entity." Building on these assertions, we conceptualize that social media contents (i.e. FGC and UGC) positively affect firm performance.

[Insert Figure 1 about here]

Content analysis

We analyze the textual or qualitative UGC (user generated content) and FGC (firm generated content) data for quantitative analysis using text mining techniques (Das and Chen, 2007; Goh et al., 2013; Wu, 2013). Landauer, McNamara, Dennis, and Kintsch (2007) introduce latent semantic analysis (LSA) technique, in which word meanings are extracted by determining the company the word keeps across large corpora of texts. The method we employ is latent Dirichlet allocation (LDA) - an advanced statistical technique that classifies content into distinct topics. LDA is a generative probabilistic model that extracts topics from a textual content based on its large library. It is assumed that each topic is a vector of words that are statistically related to each other (Wen and Lin, 2010; Blei et al., 2003). We define each word or term in terms of a vector (i.e., one dimensional array of values) of the documents in which it occurs. It is a large matrix because there are many terms across many documents; then the matrix is reduced to discover its latent properties. We first search the entire topic space using every document in the corpus. After classifying words into topics, we find the topic space in each individual document. As we measure, a document is an aggregate of all the Facebook posts in a person's or firm's communication during a month. A document is thus an aggregate of all the posts and comments produced as UGC or FGC. We classify 127 topics using the entire corpus of electronic communications. The average cosine dissimilarity of the topic space in a user's Facebook pages provides the basis for calculating information diversity for each person in every month. On the other hand, similarity metrics such as the cosine between words, or collections of words, are indicative of how related they are in a LSA approach: a higher cosine indicates that the words are more related. The meanings of the words, sentences, and texts can be derived by uncovering these latent relations between words (Landauer, McNamara, Dennis, and Kintsch, 2007).

We derive the valence of a review from an analysis of the text in UGC and FGC using computational procedures. Importantly, the statistical algorithms used for the binary text classification of the reviews are proven to be robust (Joachims, 1999). Drawing on a sentiment classification algorithm, i.e., Naïve Classifier (Das and Chen 2007), we measure valence as the net positivity (i.e., number of positive concepts minus number of negative concepts) in a given time period[3]. We check each word in a text against the lexicon and give a value (-1, 0, +1) based on sentiment type (negative, indifferent, positive). We take the net word count of all lexicon-matched words; the text is deemed positive (negative) if the value is greater (less) than zero; else, it is indifferent. We employ two different measures to assess the firm's performance: first, we obtain monthly financial performance (PFIN) data in terms of revenue growth (Wu, 2013) and, second, we use the number of UGC and FGC shared by the members of the online SM community (CSHARE). Safko (2010) suggests the importance of regular updates in order to indicate that the business is active and responsive - such as new product information, relevant news stories or upcoming company events. The benefits of regular updates are two-fold; not only increasing the reputation of the firm but also helping to improve search engine optimization results (Kurikko and Tuominen, 2012). Luca (2011) discusses the advantage of firms sharing interesting, industry-specific information to raise the profile and reputation of the company which can lead to more customers through word-of-mouth. Our goal is to examine if diverse information and valence can increase performance after controlling for seasonality, networks and individual characteristics. The model was test is as follows:

$$
\begin{aligned}
Performance_{i,t} = {} & \beta_1 ID_{i,t-1} + \beta_2 VAL_{,t-1} \\
& + \beta_3 UGCVOL_{i,t-1} + \beta_4 FGCVOL_{i,t-1} \\
& + \beta_5 OWNVAL_{i,t-1} + \beta_6 OWNVOL_{i,t-1} \\
& + \beta_7 UCENT_{i,t-1} + \beta_8 FBF_i + \beta_9 FCCF_i + \beta_{10} FBV_i \\
& + \beta_{11} AGE_i + \beta_{12} MALE_i + \beta_{13} INC_i + \beta_{14} PEXP_{it} \\
& + \theta_t + \alpha_i + \varepsilon_{it}.
\end{aligned}
$$

Control variables

Our control variables reflect important UGC and FGC factors that are likely to affect their performance. We measure the volumes of UGC ($UGCVOL_{it}$), and FGC ($FGCVOL_{it}$) that user i observed in the online community at period t. To control for a user's own posting valence and own posting volume, we include the average valence ($OWNVAL_{it}$) and total volume of content ($OWNVOL_{it}$) generated by consumer i in the online community at period t. Measuring a user's own posting valence and own posting volume account for potential selection bias at the content generation level. To control for peer effects, influence and general activity in the online community, as well as a user's Facebook social network at large, we include the following variables. We compute a user's ("fan") degree centrality ($UCENT_{it}$) on the fan page to quantify his or her influence in the online community. This is based on the communication ties user i maintained with other users on the user page in period t, reflecting the network structure of users in the online community. To control for the effects of a user's Facebook social network at large, we include the number of Facebook friends (FBF_i), the number of user i's Facebook friends who were also users on the user page ($FCCF_i$) and the count of Facebook page views (FBV_i) , i.e., total number of Facebook page views since consumer i's registration of an account on Facebook). These measures vary across individual users but are time invariant. We also include a set of monthly time dummies (θ_t). We also control for individual user's demographics to obtain robust estimates of the effect of focal UGC and MGC measures. The specific demographic variables included are a user's age (AGE_i), gender ($MALE_i$), i.e., a dummy indicator for male gender (1: male, 0: female) and monthly income (INC_i), i.e., the level of consumer i's monthly income (1: lowest, 5: highest). We also account for a user's past expenditure ($PEXP_{it}$) i.e., user i's average expenditure per transaction prior to period t.

EMPIRICAL ESULTS

Study Data. Currently, almost 50% of the worldwide online population is covered by Facebook (Burke, et al., 2011; StatisticBrain, 2014), the most representative platform in social networking sites, with half of its users accessing it for 20 minutes every day, generating a total amount of 4.5 billion likes and 4.7 billion shares (StatisticBrain, 2014). Aiming at reaching and interacting with these massive audiences, firms are increasingly present at Facebook, with the top 20 worldwide CPG advertisers accounting for more than 300 million users worldwide in their brand like pages (StatisticBrain, 2014). A detailed review of studies of Facebook use (Shiau, Dwivedi and Lai, 2018) indicate us that content have not been used for analysing the causal relation with performance of firms.

In this research, we use a large firm's online community dataset that contains both Facebook content information as well as user transaction information. The firm set up its online community page on Facebook in September 2012 to engage and interact with its customers and other users. The community page serves as a platform for the firm to create and pursue an image of itself that it believes best reflects its strengths and long-term interests. Using specific Java codes based on the Facebook application programming interface, we retrieved all user interaction contents from the focal firm's fan page community on Facebook. We undertake a quantitative analysis of the content of the Facebook posts and their responses, and therefore the data were not created directly for the purpose of this research. Consequently, it avoids response biases caused by the researcher being present at both interviews and observations. The posts to be reviewed were limited to a specific time frame to allow a valid comparison between firm-generated content and user-generated content. We measure information diversity by examining the diversity of information content, using the content of all posts and comments posted on the brand community page. As applies to any social media data, the data collected were of users who are active members of the platform and are not necessarily representative of the population (Rathore, Ilavarasan and Dwivedi, 2016). However this criticism is applicable to all kinds of secondary research including content analysis.

In addition to Facebook page information, we obtained company performance data in terms of revenue growth. We also gathered data about user demographics and usage logs from the information provided by Facebook to the firm. Our data span 96 weeks from September 2012 till August 2014, including information from about 7,850 fans in total with 2.23 FGC posts on average per week (std. dev. = 2.56, max = 7) and 2.59 FGC comments on average per week (std. dev. = 3.67, max = 14) and on average 1.48 UGC postings per week (std. dev. = 2.38, max = 13) and on average 4.57 UGC comments per week (std. dev. = 5.34, max = 38). On a weekly basis, UGC plus MGC participations averaged 16 incidences (std. dev. = 14.53, max = 61). Table 1 provides the descriptive statistics of the model covariates. Table 2 includes a correlation matrix for key research variables. As can be seen, the variables in the model generally have large dispersions in the variable values (i.e., mean > std. dev.). For example, there is a high level of variability in the UGC and FGC information diversity and valence. Another thing to note is that the means and standard deviations of UGC information diversity and valence are higher than those of equivalent FGC variables.

[Insert Table 1 and 2 about here]

Analysis. Our first goal is to consider whether the use of social media in an online community context generates information diversity and valence: the two types of intermediate information mechanisms theorized to provide reputation benefits. Social media-based user communities can provide these benefits by enhancing the capacity of individual members to share and communicate diverse and critical information with each other. We calculate information diversity as the topic dissimilarity score in a person’s Facebook post, whereas valence is calculated by measuring the net positivity present in FGC (firm generated content) and UGC (user generated content). We then undertake tests to investigate the impact of these mechanisms on firm performance (i.e. financial performance and content shares).

As we discover the relationships of FGC and UGC with two different information mechanisms (i.e. information diversity and valence) are associated with an online SM community (we do not provide detailed results here; see Hypothesis 1 and 3). Baird and Parasnis (2011), Godes and Mayzlin (2009) and Nisar et al., (2018) opine that effective social media campaigns include avoiding explicit and repetitive promotional approaches. This approach expects the firms to listen to various stakeholders online and provide information rather than forcing information. Earlier research (Shareef et al., 2018) found that the users should not feel the difference between their own content and those given by the firm to have better engagement. Our empirical support for hypotheses validated the propositions of the earlier researchers. Overall, these results show that having an online community generates important reputational effects for the firm. As users become members of an online SM community, they are likely to acquire information that they have not previously been exposed to. Hence, their level of information diversity increases, as reflected in their increased knowledge of the company's goals and practices. These results are also important as they go beyond recognizing the importance of information diversity in an online SM community and bring into play the role of 'valence' as an important component of such a community (Goh et al., 2013). Although the relationship between FGC and valence is negative in our results, this is mainly due to the very nature of FGC contents that focus more on communicating product design features and their functionality or similar other firm information. Unlike the information diversity, there are differences between UGC and FGC on valence. The users seem to have better empathy for fellow UGC rather than FGC. This is an important findings on how people emotionally relate to the content. Earlier research indicates that positive online behaviour can be predicted by emotional appeal, informativeness and creativity (Lee and Hong, 2016). It is also found that users prefer to read eWOM reviews over company advertising as they trust the viewpoint of the user who is not linked to the company and they have no reason to lie in the review so can be trusted to give an honest opinion (Antweiler and Frank, 2004; Akhter et al., 2017).

Social media reputational effects and firm performance. We examine the extent to which reputational benefits of an online social media affect a firm's financial outcomes, after controlling for individual and SM community characteristics. We quantify these benefits in terms of the two particular types of information mechanisms that characterize an online SM community: information diversity and valence. Both information diversity and valence were centered to have a mean of 0 and a standard deviation of 1. This was intended to make a comparable comparison between the two information mechanisms (Wu, 2013). The results show that both the intermediate information mechanisms are positively associated with firm performance (see Table 3). We find a significant positive relationship between information diversity and revenue growth. Per our results, as Column 1 shows, a one standard deviation increase in information diversity is correlated with generating an additional $584.15 of revenue. Moreover, valence is statistically significantly correlated with revenue growth (β = 128.29, $p < 0.01$; see Column 2). We further find that information diversity and valence are positively correlated with generating revenue (Column 3) when treating both information diversity and social communication as independent variables in the same model. Column 4 presents the RE model results, which are very similar to the other reported results. We thus find support for Hypothesis 5A and 5B. The findings, online reputation of the firms measured through information diversity and valence predicts the firm performance, contribute to the literature on eWOM (Ismagilova et al., 2017; Lee and Hang, 2018). It also adds to the pre electronic studies (for instance, Rao et al., 2001; Shaipro, 1982) that found favourable reputation leads to repeat purchases.

[Insert Table 3 about here]

Firm reputation effects and their relationships to user engagement. In the above, we have shown that both information diversity and valence produce reputational effects in an online SM community and improve the firm's financial performance. In this section, we investigate whether both these effects also influence the level of engagement within the online community. In other words, what is the impact of information diversity and valence on users' propensity to 'share' FGC and UGC posts? The more users share these posts, the greater is the likelihood that firm information is circulated and discussed in the community (i.e. eWOM). Table 4 presents the results. In Column 1 we find that information diversity has a significant positive impact on user engagement (1.86, $p < 0.01$). More a referral community is information-rich the greater is the likelihood that users will engage with each other. That is, they will share more firm-generated content and user-generated content. We find a similar relationship in terms of the impact of valence on user engagement (see Column 2). Higher levels of valence result in more user engagement.

[Insert Table 4 about here]

DISCUSSION

Contributions to theory and practice

The paper contributes in many fronts. Both in conceptualization and empirical validation, novel approach is undertaken for two concepts information diversity and valence and their causal linkages with financial performance of the firms, in the light of social media analytics. It clearly differentiates the nature of content – FGC and UGC and how they are contributing the financial performance of the firms. Rather than treating social media content as homogeneous while attempting to examine the engagement, clear analysis is provided highlighting the differences. Research on technology adoption is enriched by moving to the next stage, impact of technology. Most of the studies on social media domain use the primary survey data. The present study complements the field by demonstrating how social media content can be extracted and analyzed for causal relationships.

The Internet has developed eWOM (electronic word of mouth) to the extent that it has transformed the way businesses are managed, as reflected in customer acquisition and retention, reputation building, product development and quality assurance (Chen and Xie, 2008). Increasingly it is being acknowledged that social media users play a role in defining, creating and extending a firm's image (Tam and Ho, 2005). Traditional paid-for, one-way communication (i.e. advertising) is becoming redundant in the business world; two-way communication channels are much more effective and personal (Sylvain and Nantel, 2004). As we enter a new phase of social media and virtual world communications, online communities promote the opportunity of interaction and collaboration that empower users (Angst, et al., 2010). This study provides evidence to explain how the process of acquiring group knowledge and information operates in a buyer managed online community that leads to the sense of positive feeling toward the firm. Previous studies viewed user engagement as a dimension derived solely from the perception of personal control. Our study argues that it also stems from the voluntary interactions in the online community collaborative actions. We thus find support for the notion that a firm's reputation encompasses the different ways through which it interfaces with its stakeholders (Boyd, et al., 2010). The firm's collaborative actions and forums are useful because they allow users to engage with the firm and create personal and prosocial relationships (Spaulding, 2010; Bergh et al., 2010). In addition, two-way communication can provide businesses with increased transparency (Tiwana and Bush, 2000). These features of a new Internet world are a challenge to manage as there are growing expectations with the simultaneous rise of consumer power, corporate social responsibility, and widespread Internet and social media use.

Our results also show that engagement in social media communities affects a firm's financial performance. Importantly, social media provides information benefits by increasing the capacity of individuals to share and communicate diverse and critical information. As we find, these benefits enhance a firm's reputation and affect performance. It is thus possible to conclude that online communities are more effective when they manage to influence firm behavior. This allows us to postulate that in the context of SM communities, reputation benefits are largely dependent on the capacity of the firm to evoke and maximize behaviors relating to FGC, including providing unbiased and complete information, fostering transparency, developing a clear set of norms and best practices for coping with negative interactions and fostering positive ones. Furthermore, the study validates the positive consequences of UGC, positioning online SM communities at the center of managerial objectives. This represents a new challenge for the firms which, in order to improve the effectiveness of an online SM community, needs to go beyond the original scope of their products, providing entertainment, information and socialization (Tiwana and Bush, 2000). In the ensuing process, new firm competences may be required that shed light on the relevance of implementing adequate content generation and distribution agendas and models.

Our findings suggest that organizations need to recognize the increased demands placed on strategic reputational boundary objects because of the emergence of a new social contract between organizations and their stakeholders. Placing reputation risk issues in the context of an increasingly communication and information-driven society reinforces the idea that reputation risk issues must be managed, as they are subject to ongoing reflexive assessment and two-way communication. Users on social media are now the most influential consumers of firm related content, creating a demand for high interactivity between the firm and market agents. In this study, we have shown that these demands can be fully met by focusing on the intermediate information mechanisms that are likely to generate reputation benefits for companies.

CONCLUSION

On the basis of UGC and FGC collected for a sample firm, the present paper established that online reputation benefits measured through information diversity and valence influences the firm performance. The data were collected from Facebook and topic modelling and sentiment analysis were performed. FGC and UGC are associated with information diversity. UGC is related to valency positively, wherein the relationship was reversed in FGC. Both information diversity and valency are related to revenue growth, an indicator for firm performance. The reputation is also having positive relationship with user engagement. The study underlines that both FGC and UGC are important for user engagement and firm performance. The findings are noteworthy given that results on causal relationship between social media and firm performance are yet to be established firmly.

Limitations and future research directions

The study has few limitations which can be undertaken by future research. The data were collected from one platform, Facebook. The user behaviour might be different for other platforms. Trends indicate that young users are ditching Facebook for other platforms like Instagram or Snapchat. Future researchers should explore these platforms. However, data extraction from these platforms are difficult due to restrictions.

The data were collected about one firm and their users. The study is able to establish a new methodology to examine the linkage between social media and firm performance. A replication study involving multiple firms shall refine the methodology. Needless to say, including contextual factors like nature of product, geography, user characterises, firm characteristics and non-text content shall increase the robustness of the framework. This involves developing applications with help of computer scientists to collate the data and perform the complex analysis. An interdisciplinary research in future can attempt the same.

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Notes

[1] Albuquerque et al. (2012) show that "content creators themselves frequently generate significant "free" marketing for the platform's content in the form of referrals and marketing campaigns (p. 407)."
[2] See Boyd, et al. (2010) for other relevant perspectives.
[3] Valence of UGC (FGC) can also be measured in terms of whether the overall review is positive or negative.

Figure 1. Antecedents and consequences of firm reputation

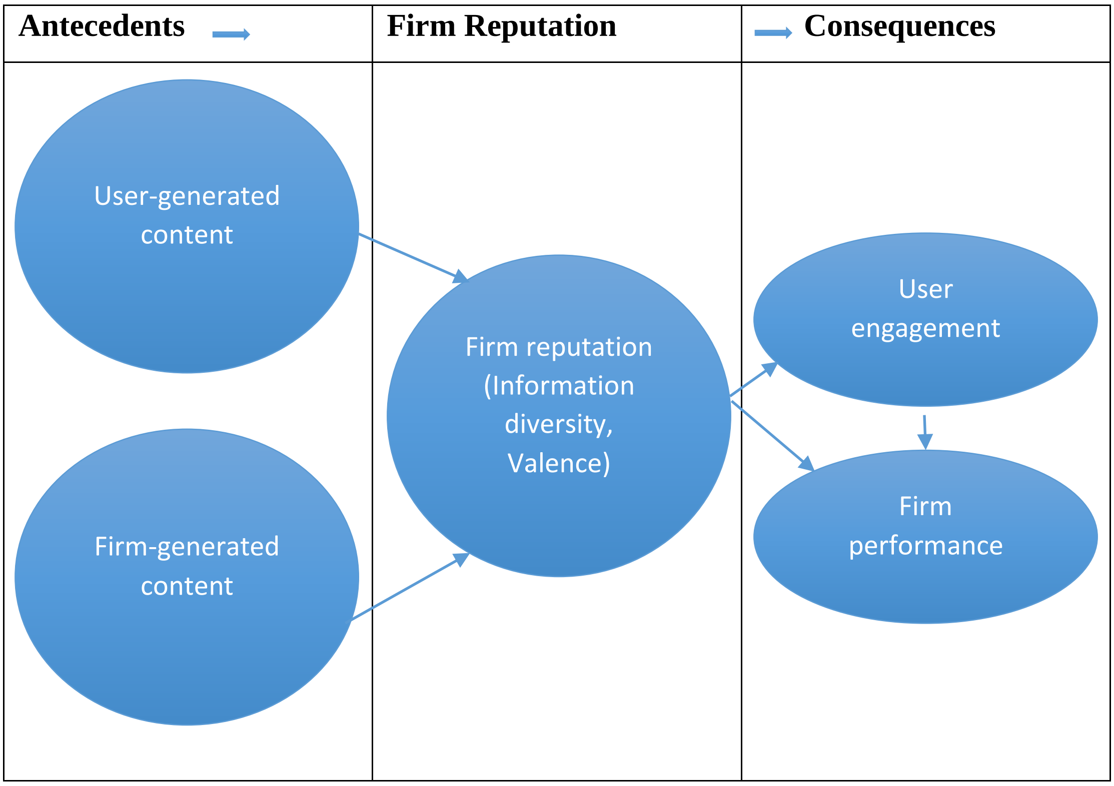

Table 1. Descriptive statistics.

Variable	Mean	Median	Std. dev	Min	Max
ID	8.96	7.58	4.63	0.00	26.00
VAL	0.79	0.74	0.16	-3.00	5.80
PFIN	3.16	0.00	19.45	0.00	476.71
CSHARE	0.41	0.40	0.87	-7.00	4.00
UGCVOL (UGC, volume)	46.58	7.00	34.73	0.00	1.06
FGCVOL (FGC, volume)	13.34	4.00	11.83	0.00	134.00
OWNVAL (Own posting valence)	0.01	0.00	0.01	-0.40	1.00
OWNVOL (Own posting volume)	0.04	0.00	0.06	0.00	5.00
UCENT (Degree centrality)	0.01	0.00	0.08	0.00	1.00
FBF (number of Facebook friends)	337.85	265.00	316.74	0.00	3,869.00
FCCF (number of Facebook friends on FFS)	3.98	4.00	5.89	0.00	53.00
FBV (number of Facebook page views)	164.26	88.00	167.58	0.00	2,465.00
AGE (age)	34.77	33.52	7.67	17.81	56.69
MALE (gender)	0.14	0.00	0.34	0.00	1.00
INC (income level)	3.26	2.00	0.87	1.00	5.00
PEXP	34.72	28.86	31.74	0.00	246.51

Notes. Observations = 19,832.

Table 2. Pearson correlations (a select group of variables reported) (1 = ID)

	1	2	3	4	5	6	7	8	9	10
2.VAL	0.48									
3.UGCVOL	0.17	0.65								

4.FGCVOL	0.36	0.32	0.29							
5.OWNVAL	0.42	0.52	0.38	0.23						
6.OWNVOL	0.24	0.53	0.26	0.20	0.48					
7.AGE	0.28	0.58	0.24	0.31	0.35	0.24				
8.MALE	0.48	0.63	0.49	0.54	0.57	0.48	0.37			
9.INC	0.32	0.45	0.28	0.43	0.75	0.52	0.39	0.47		
10.PFIN	0.16	0.61	0.57	0.22	0.62	0.54	0.31	0.52	0.53	
11.CSHARE	0.13	0.55	0.28	0.34	0.38	0.41	0.35	0.64	0.49	0.21

Table 3. Social media and performance

Model	**(1) Monthly Revenue**	**(2) Monthly Revenue**	**(3) Monthly Revenue**	**(4) Monthly Revenue**
Model	**FE**	**FE**	**FE**	**RE**
Information diversity (standardized)	584.15*** (2.64)		532.47*** (2.83)	527.96*** (2.37)
Valence (standardized)		128.29*** (1.17)	186.48*** (1.18)	147.38*** (1.16)
Information diversity x Valence			0.08 (0.15)	0.03 (0.18)
UGCVOL			0.18** (0.15)	0.09** (0.05)
FGCVOL			0.23** (0.15)	0.35** (0.18)
OWNVAL			0.23 (0.15)	0.17 (0.09)
OWNVOL			0.17 (0.12)	0.18 (0.13)
UCENT			0.26** (0.18)	0.15** (0.11)
FBF			0.34** (0.27)	0.16** (0.21)
FCCF			-0.01 (0.01)	-0.05 (0.09)
FBV			0.12** (0.05)	0.21** (0.19)
AGE			0.02 (0.04)	0.08 (0.04)
MALE			0.25 (0.18)	0.10 (0.06)
INC			0.34*** (0.27)	0.11*** (0.18)

PEXP			0.12 (0.03)	0.08 (0.05)
Observations	19,832	19,832	19,832	19,832

Notes: Month dummies and individual fixed effect are included. Standard errors in parentheses. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

Table 4. Social media and user engagement

Model	**(1) Content Share**	**(2) Content Share**	**(3) Content Share**	**(4) Content Share**
Model	**FE**	**FE**	**FE**	**RE**
Information diversity (standardized)	1.86*** (1.14)		1.58*** (1.26)	1.47*** (1.33)
Valence (standardized)		1.74*** (1.35)	1.48*** (1.17)	1.25*** (1.38)
Information diversity x Valence			0.05*** (0.03)	0.07*** (0.01)
UGCVOL			0.36** (0.03)	0.27** (0.13)
FGCVOL			0.27** (0.19)	0.11** (0.10)
OWNVAL			1.10** (0.72)	0.69** (0.53)
OWNVOL			0.14** (0.13)	0.16** (0.04)
UCENT			0.37** (0.26)	1.27** (0.12)
FBF			1.08** (0.96)	1.03** (0.40)
FCCF			0.82*** (0.52)	0.46** (0.43)
FBV			0.40*** (0.35)	0.19** (0.13)
AGE			0.23* (0.14)	0.37* (0.27)
MALE			0.37* (0.25)	0.26* (0.14)
INC			0.21*** (0.16)	0.26*** (0.12)
PEXP			1.18*** (0.79)	0.69*** (0.53)
Observations	19,832	19,832	19,832	19,832

Notes: Month dummies and individual fixed effect are included. Standard errors in parentheses. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.