IMPROVING SENSING AND SEIZING CAPABILITIES OF A FIRM BY MEASURING CORPORATE REPUTATION BASED ON SOCIAL MEDIA DATA

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Abstract

Firms need to continuously sense their business environment for being able to seize emerging opportunities and react against threats, such as loss of reputation. Corporate reputation is of particular importance as a valuable intangible asset. Thus, managing a firm’s corporate reputation as well as monitoring the reputation of its competitors may support sensing and seizing capabilities of a firm. As corporate reputation directly depends on public perceptions and opinions, the high amount of publicly available data of established social media platforms might be promising to determine a firm’s reputation. What is needed are intelligent information systems to analyze social media data for measuring corporate reputation effectively. This study provides a conceptual and empirical analysis on how firms might utilize data from social media platforms for measuring their corporate reputation. In particular, we analyze a dataset consisting of 8.6 million messages from the microblogging service Twitter to determine the development of the corporate reputation of ten large global firms. Our methodological approach comprises an automated sentiment analysis as well as trend analysis to measure reputation. Thus, this study demonstrates how corporate reputation can be assessed based on social media data and how firms sensing and seizing capabilities can thereby be enhanced.

Keywords: Dynamic Capabilities, Reputation, Social Media, Trend Analysis, Sentiment Analysis.
1 Introduction

Growing environmental dynamics such as competitive rivalry, unpredictable global events, and fast shifting customer demands make it increasingly difficult to establish sustained competitive advantage (D'Aveni, 1994; Teece, 2007). In these rapidly changing and highly competitive environments firms have to establish capabilities to identify emerging opportunities or threats and effectively capitalize on opportunities to remain competitive (Teece et al., 1997; Barua et al., 2004). This can be done by e.g. launching new products and services, entering new market segments, or forming strategic alliances. More precisely, firms must be able to sense and seize business opportunities for increasing the opportunity to establish competitive advantage (D'Aveni et al., 2010; Teece, 2007).

The emergence of new information and communication technologies, such as social media platforms, presents unique opportunities for firms to enhance these important capabilities by extracting information from a company’s environment and integrating this information into existing organizational knowledge (Teece, 2007). This means that the creation of efficient information transferring and integration procedures are key microfoundations for improving sensing and seizing as important dynamic capabilities of a firm (Chesbrough, 2003; Haekel, 1999; Teece, 2007). In particular, emerging social media platforms such as social networking sites and microblogging platforms provide firms with the opportunity to extract unfiltered and unchanged opinions and thoughts from many people in real-time and at low cost (Dellarocas, 2003). In this context, social relationships, conversations, and posts in such platforms result in a continuous stream of valuable information (Roberts and Grover, 2012). Moreover, stakeholders increasingly rely on the information drawn from such platforms which has a significant impact on the performance and competitiveness of a firm (Rindova et al., 2005). Thus, firms that effectively absorb information from social media platforms should do better in sensing and seizing opportunities for innovation and competitive action (Teece, 2007).

In this paper, we focus on measuring a firm’s corporate reputation that can help to establish competitive advantage through analyzing social media content (Barney, 1991). Accordingly, this paper aims at enhancing our understanding of how established social media platforms such as Twitter can be utilized to improve an organization’s sensing and seizing capabilities by providing unfiltered and continuous information for measuring corporate reputation. Therefore, we conducted an empirical study based on microblogging messages to analyze how firms can benefit from absorbing information from social media platforms for corporate reputation measurement to improve sensing and seizing capabilities of a firm. Hence, we contribute to existing research on dynamic capabilities, corporate reputation, and social media in several directions. In particular, we combine these research streams and discuss how information technology (IT) can improve an organization’s sensing capabilities. In this regard, several authors have called for more research on the role of information and communication technologies in facilitating a firm’s dynamic capabilities (Sambamurthy et al., 2003; Overby et al., 2006; Roberts and Grover, 2012). Focusing on social media platforms for improving sensing and seizing capabilities of a firm, we respond to these calls by applying established theoretical concepts to an innovative and rapidly emerging area of research. Moreover, we contribute to the few existing scientific studies that discuss how firms can benefit from extracting and analyzing the large amount of data that is available on established social media platforms (e.g., Culnan et al., 2010).

The remainder of this paper is organized as follows: In the next section we provide the theoretical background and conceptually describe how sensing and seizing capabilities of a firm can be supported by enhancing information about corporate reputation based on social media data. In section three, we deploy an empirical study to measure corporate reputation based on data from Twitter. Subsequently, we compare our objective reputation measure with a popular survey-based reputation ranking called “RepTrak Pulse” which is published by the world's leading reputation management consultancy “Reputation Institute”. Finally, we discuss our results, derive implications of our findings, and present limitation of our study as well as opportunities for future research.
2 Theoretical Background

2.1 Supporting Dynamic Capabilities by Corporate Reputation Measurement

In our study, we build upon Fombrun (1996, p. 72) who defines corporate reputation as “a perceptual representation of a company’s past actions and future prospects that describes the firm’s overall appeal to all of its key constituents when compared with other leading rivals”. In this regard, corporate reputation can be described as a function of stakeholders’ perceptions including experience from interacting with a firm and receiving information about the firm (Walsh and Beatty, 2007). In extending this view, we argue that evaluations and opinions of non-stakeholders can have a significant impact on a firm’s reputation as well and therefore are also important in the process of assessing corporate reputation.

With regard to the resource-based view of the firm (Barney, 1991), corporate reputation can be considered as an intangible asset that can be leveraged to establish competitive advantages. In this respect, a firm’s competitiveness is considerably influenced by its corporate reputation due to the fact that a positive reputation may lead to a higher customer loyalty, or higher sales rates which in turn enable a firm to reach a better market position by building entry barriers (Walsh and Beatty, 2007; Fombrun and van Riel, 1997). Furthermore, having a positive reputation may reduce labor turnover and may increase attractiveness for potential employees (Nakra, 2000). On the contrary, having a negative corporate reputation can cause existential risk for firms due to decreasing sales and scaring away investors as well as employees (Fombrun and Shanley, 1990; Scott and Walsham, 2005). Thus, it is crucial to assess changes in corporate reputation as it has impact on firm performance and hence carefully manage reputation as a valuable asset (Walsh and Beatty, 2007). In detail, we suppose that a firm can improve its sensing and seizing capabilities based on the ability to assess its own corporate reputation as well as the reputation of its main competitors (Teece, 2007) which allows for identifying and evaluating market opportunities in order to perform appropriate competitive actions (Teece, 2012).

Sensing in this context describes a firm’s capability to continuously identify and evaluate opportunities of relevant environmental changes for competitive action (Overby et al., 2006; Teece et al., 1997). Therefore, enhanced sensing capabilities should enable firms to perceive opportunities and threats by scanning, interpreting, and understanding their environment (Teece, 2007). To identify opportunities, firms must constantly search and explore across markets and competitors (March, 1991). Thus, sensing activities involve investing in exploring customer needs and assessing competitors’ behavior (Nonaka and Toyama, 2007; Teece, 2007). Continually determining its corporate reputation helps a firm to assess the loyalty of its customers indicating how the market evaluates a firm’s innovativeness, goods, and services (Bailey and Bonifield, 2010; Walsh and Beatty, 2007). Moreover, it enables a comparison between a firm and its competitors without considering financial key performance indicators (Fombrun and Shanley, 1990). Hence, we suppose that knowledge about corporate reputation provides important information about how customers evaluate a firm and customer needs as well as tracking the position of competitors as microfoundations that are essential for establishing sensing capabilities.

Information and clues about opportunities and threats that firms have gathered are subsequently used to determine how to utilize these changes by seizing opportunities (Teece, 2007). Thus, seizing is defined as a firm’s ability to set up on identified opportunities and threats by, e.g., launching new services and products timely or building and adjusting processes effectively (Teece, 2007). Identifying reputational weaknesses of competitors should help an organization to achieve advantages in the market through catching up these shortcomings in a targeted and timely manner. In this regard, firms may gain market shares through attracting customers resulting from effective marketing actions and product innovations (Dellarocas, 2003). As a result, we suggest organizations enhance their seizing capabilities through analyzing social media as this should help to identify appropriate actions (e.g., satisfy customer needs) for competitive action.
2.2 Utilizing Social Media for Corporate Reputation Measurement

Measuring and managing reputation has moved to the top of the agenda for many companies, although corporate reputation remains an elusive concept which is difficult to measure. The second Basel accord (Basel II) requires financial institutions to manage reputational risks, but does not define reputational risk (Basel Committee on Banking Supervision, 2006). Furthermore, Basel II admits that reputation is difficult to measure and requests institutions to develop techniques for measuring reputation. Today, corporate reputation is commonly measured using surveys to assess the opinions of individuals about firms’ product quality, innovativeness, labor conditions, or social responsibility (e.g., Reputation Institute, 2012). The disadvantages of survey-based reputation measurement primarily result from the effort and costs that come along with conducting a survey and from the substantial delay due to long lasting preparation and execution times. The setup of a survey, its execution, and the analysis of its result can take several weeks leading to the fact that the results are no longer representative and useful for competitive actions. Hence, techniques and information sources for measuring corporate reputation are needed which allow a (close to) real-time analysis.

In the past few years, social media platforms gained a lot of attention in research and practice (e.g., Kietzmann et al., 2011). Recently, the social networking site Facebook hit one billion active users (Facebook, 2012) and the microblogging service Twitter delivered more than 500 million messages per day (Terdiman, 2012). Hence, information shared on such platforms can reach an enormous group of people that is intensified due to its push communication at high-speed (Kaplan and Haenlein, 2010). Research regarding social media platforms has shown that individuals exchange information mostly about themselves and their opinions rather than objective information which results in a high amount of subjective content (Naaman et al., 2010). Thus, the way people can interact and share information on social media platforms implies opportunities as well as threats for firms regarding their reputation (Jones et al., 2009). This is of particular importance for firms since stakeholders such as customers, potential employees, or investors include opinions of others in their decision making and the resulting actions (Rindova et al., 2005). Therefore, collecting and analyzing social media data to gain knowledge about corporate reputation enable firms to avert reputational damage and thus negative consequences for their business. Nevertheless, besides the threat of fast dissemination of negative information about a firm, social media platforms contain a high amount of important information regarding a firm that is accessible at low cost (Dellarocas, 2003). Therefore, we propose that social media platforms where users distribute information and intensively interact with each other might be a promising source of information for corporate reputation measurement as information based on word of mouth is correlated with corporate reputation (Walsh and Beatty, 2007).

3 Tracking Corporate Reputation with Social Media: An Empirical Investigation of Corporate Reputation

In this section we provide an empirical study to evaluate how firms may utilize data from social media platforms for measuring corporate reputation to enhance their sensing and seizing capabilities. For this purpose, we focus on information provided by the public such as users of social media platforms regarding large global firms which are supposed to attract a great extent of public attention for being able to compute changes in corporate reputation. In this regard, knowledge about corporate reputation is one of the major capabilities of a firm (Fombrun, 1996; Jones et al., 2009). In the following, we thus elaborate on the question of how social media might be analyzed for improving corporate reputation measurement in order to identify opportunities and threats for being able to seize appropriate actions.

As depicted in Figure 1, our empirical study comprises four consecutive steps that also structure the remainder of this section. First, we set up the data collection including evaluation of how to gather data from a social media platform and which data should be obtained needed for analysis. Furthermore, we acquire an external reputation ranking for later comparison with our results. Second,
an automated sentiment analysis is implemented and social media data is processed where text is classified based on subjectivity. In the third step, we use the resulting sentiment values and estimate trends which will be compared with the external reputation ranking to analyze validity of our results. Finally, we illustrate our results and discuss how to utilize the results in a corporate context as well as addressing differences in comparison with the external data.

Figure 1. Step-by-step approach for assessing corporate reputation based on social media data.

3.1 Data Collection

To measure corporate reputation based on public expressed opinions and perceptions, we set up a system to collect messages from the public social media platform Twitter. Twitter is a microblogging service allowing users to share short messages. Since Twitter allows collecting data via its freely usable application programming interfaces, we deployed an open source tool called “your Twapper Keeper” (O’Brien, 2012) in a cloud-based server environment to access and extract data from Twitter. In a next step, we had to define specific keywords that were utilized to extract Twitter messages. As already mentioned, we aim at measuring and analyzing the corporate reputation of large global firms. Thus, firms on the Fortune Global 500 ranking – including the 500 biggest firms worldwide measured by revenue – were selected and keywords (e.g., firm name and ticker symbols) for collecting messages regarding these firms were defined. Afterward, we created for every single keyword a separate archive for storing the messages. The archives were used to collect data automatically during the period from April 2011 till April 2012. This period was chosen as we want to compare our results from the future trend analysis with the reputation ranking published by the Reputation Institute to evaluate the validity of our approach (Reputation Institute, 2011, 2012). This reputation ranking is based on a questionnaire that comprises questions in four dimensions; feeling, trust, esteem, and admire. The surveys were conducted in April 2011 and March/April 2012 and questioned online consumers in 15 different countries to evaluate the most reputable companies in the world. As this study presents a first analysis of our data we focused on the top 10 firms of the reputation ranking 2012. Regarding these firms, our data sample comprises approximately 8.6 million messages including metadata such as user-id, timestamp, language code, and geo coordinates.

3.2 Sentiment Analysis Procedure

The presented definition of corporate reputation stresses the point that it is based on perceptions about an organization which are typically pronounced positively or negatively (Fombrun, 1996; Walker, 2010). Accordingly, we considered only those messages shared on Twitter that contained public perceptions which include positive and negative emotions and opinions about a firm. Due to the great amount of data we chose to conduct an automated sentiment analysis which is considered to be appropriate for assessing “…positive and negative opinions, emotions, and evaluations…” (Wilson et al., 2005, p. 347). A sentiment analysis is usually performed employing two consecutive steps: subjectivity and sentence level classification (Liu, 2010). The goal of subjectivity classification is to assess whether the text is subjective (i.e., including opinions of individuals) or not. In case that the text is subjective, it will be extracted for sentence level classification which afterward determines the
polarity (positive or negative) of the text. In addition, the strength of the classified polarity is
determined to be able to bring sentiment of different texts in relation to each other.

For classifying message subjectivity, we applied a dictionary approach which analyzes messages
based on a list consisting of predefined words that signal subjectivity (Wilson et al., 2005; Liu, 2010).
In this regard, we used a public available Java-based tool called “SentiStrength” developed by
Thelwall et al. (2010; 2012). This tool is in particular designed to analyze users’ sentiment in short
informal texts like those that can be found in content on social media platforms, i.e., in the short
messages shared on Twitter. SentiStrength allows including different dictionaries to classify various
languages. Therefore, we performed a bilingual sentiment analysis based on the General Inquirer
dictionary (General Inquirer, 2012) for English and a derived dictionary for German (Pirker, 2012).
Altogether, the dictionaries comprise more than 9,500 words and radicals which are especially
compiled for sentiment analysis of social media content. In this regard, there are lists for emoticons,
question words, negating words, and booster words which will enhance the strengths of words (e.g.,
very, little, etc.). As our setup allows for processing English and German messages there were 5.2
million (60%) messages left in the dataset for analysis whereas the other 40% of the messages in our
data sample are composed in other languages.

<table>
<thead>
<tr>
<th>Sentiment</th>
<th>Proportion</th>
<th>Examples from the dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>29%</td>
<td>“That BMW 528i commercial is excellent!”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“…I’m working in PR at BMW loving it!!!!…”</td>
</tr>
<tr>
<td>Negative</td>
<td>18%</td>
<td>“I’m not sure if I want a refund or new one- was nervous about spending $$$ and now I worry about the quality of Cannons.”</td>
</tr>
<tr>
<td>Neutral</td>
<td>5%</td>
<td>“I love the old disney, the movie always have sweet sweet duet songs, so so so touching. Where did it all go, now isn’t disney…”</td>
</tr>
<tr>
<td>Non-subjective</td>
<td>48%</td>
<td>“Microsoft slips to third in market cap, Apple still on top”</td>
</tr>
</tbody>
</table>

Table 1. Sentiment distribution and coding examples.

The next step, sentence sentiment classification determines the polarity and strength of the messages.
Since Twitter messages are limited to a maximum of 140 characters and usually consist of not more
than one sentence, we chose the messages level as our object of analysis. In this regard, the utilized
dictionaries already included values of polarity for every word on a scale form “+5” (very positive) to
“-5” (very negative). In order to perform the large amount of data, we developed a Java-based
application to perform the bilingual sentiment analysis automatically. Therefore, the collected Twitter
messages were extracted from the SQL database. Subsequently, it was checked whether a message is
English or German. Based on this distinction the messages were processed by the SentiStrength
algorithm utilizing the relevant dictionary. Afterward, the results were returned into the database for
further analysis. The results of the performed sentiment analysis as well as some examples of
classified messages are presented in Table 1. The SentiStrength algorithm returned for each message
both polarity values on which we built an average sentiment value per message. As a result, in our data
set 2.7 million messages had a subjective content. Thereby, the positive classified messages
(1.5 million) outweigh the negative classified ones (1 million). However, many messages contain
words with positive as well as negative polarity and so 250,000 of the messages had a balanced
amount of negative and positive sentiment and are therefore classified to be “neutral”.

3.3 Trend Estimation and Data Analysis

After completing the sentiment analysis, we aggregated the results and calculated a daily average of
the sentiment values for each firm. Subsequently, the data was extracted from the SQL database to
perform the trend estimation with the statistical software Stata (StataCorp, 2009). Thereby, we
estimated the trend parameter for the time series of sentiment values. Thus, we want one single value
that represents the development of corporate reputation via data from social media platforms within the period of analysis. The trend estimation allows the comparison of our results with the reputation ranking published by the Reputation Institute for evaluating the validity of our approach.

For estimating the trend parameters of the sentiment time series, we chose the rank-based non-parametric Theil-Sen median slope estimator as a generalization of the Hodges-Lehmann median difference method (Newson, 2002). The mechanic behind this estimator is to determine a slope for every possible pair of points in a time series which results in \([1/2 \cdot n (n-1)]\) slopes. Afterward the median of the computed slopes is determined as the Theil-Sen median slope. This method has an advantage over estimating a slope using ordinary least squares method as it is less sensitive against outliers (Newson, 2002). As an implementation, we used the “censlope” procedure of Stata to compute the Theil-Sen median slope coefficients based on the daily average of firms’ sentiment values. The results show that three firms were able to increase their reputation significantly during the period of analysis while seven firms were confronted with a drop in reputation. The next step was to analyze these results with the survey-based reputation values from the reputation ranking.

Therefore, we used the two available data points (for the year 2011 and year 2012) regarding the ranking of the Reputation Institute for comparison with our trend estimation. In this regard, we build the differences in reputation of every firm \((\text{Rep}_{\text{RI;2012}} - \text{Rep}_{\text{RI;2011}})\). First, we analyzed the direction of the estimated trends whether they were positive or negative as well as on the differences from the reputation ranking. This showed compliance between our approach for reputation measurement and the reputation ranking regarding the direction of reputation development. To further analyze the results, we performed a correlation analysis between the estimated trends and the differences from the reputation ranking. This results in a positive correlation coefficient of 0.53 at a significance level of 0.11. Even though the correlation coefficient is not significant, which may be traced back to the few degrees of freedom of this first analysis, the correlation exhibits the right direction and shows a medium relation between our estimated reputation trends and the proposed values of the reputation ranking from the Reputation Institute. In the next section we will discuss reasons for differences between the two reputation measures.

### 3.4 Discussion of the Results

As the results of our analysis show, information shared by individuals on social media platforms consists of a high amount of subjectivity that can be utilized for corporate reputation measurement. In our case, more than 50% of all analyzed messages contained subjective information that can be analyzed regarding their polarity. Based on the large volume in relation to subjectivity of social media data, intelligent information systems such as data mining and analytical systems as well as decision support systems are needed for processing and utilizing such information (Kohli and Grover, 2008; Overby et al., 2006).

As one major finding, our analysis reveals that the sentiment regarding a firm is exposed to various up- and downturns which firms have to be aware of for determining moments to seize an opportunity or to counteract against threats. Figure 2 depicts two examples, one for a positive development of reputation over time and the other for a decrease in reputation respectively a negative trend. Therefore, we choose Microsoft and Canon to illustrate corporate reputation based on data from Twitter. For illustrative reasons we connected the two data points from the reputation ranking with a dashed line. With regard to Microsoft we see a nearly constant variation in positive and negative changes in sentiment in the beginning which shifts slightly upwards to be more positive in the end. Moreover, the figure supports the robustness of the Teil-Sen estimator against large outliers as it can be seen in the left graph of Figure 2 where there is an extreme outlier at the end of the times series. In the case of Canon, we found a dichotomous development of sentiment over time. In the first half of the period of analysis there is relatively constant positive progress in sentiment which collapse in the second half of the analyzed period. Thus, the level of sentiment decreases and is rather negative, but at the end of the period there is an increase in sentiment which might be evidence for an upturn. Therefore we conclude...
that firms may enhance their sensing capabilities by analyzing the reasons for the change in sentiment and seize opportunities to counteract.

As we can see from the examples, there are significant fluctuations in sentiment development with more or less greater eruptions. Hence, this underlines the demand for a carefully managing of reputation as a valuable but very sensitive asset (Walsh and Beatty, 2007). Accordingly, firms should manage their reputation to moderate negative sentiment and to extend periods of high sentiment. Additionally, measuring corporate reputation by absorbing data from social media allows firms to consider competitors reputation and compare these to the own reputation (Fombrun and Shanley, 1990). Hence, this information supports sensing capabilities of a firm by enabling tracking competitors’ activities and market position (Teece, 2007). In this regard, Figure 3 exemplarily depicts the changes in sentiment for two competitors from the IT sector – Apple and Google – which compete in a variety of business segments such as mobile devices, cloud services, and entertainment services.

Based on the progression of the sentiment, both firms suffer from a decrease in their reputation whereas Apple suffers not as much as Google. Moreover, several points in time are apparent, where one of the two firms is exposed to a significant downturn in comparison to the other. Such situations can be utilized by the firm which has a currently superior reputation to attack its suffering competitor. Thus, information about reputation of competitors might serve for identifying threats and opportunities to support seizing capabilities of a firm (Teece, 2007). In this regard, firms can exploit phases where its rivals suffer from negative or decreasing reputation to attract customers or headhunting new employees, or announce new products and services. Furthermore, firms are exposed to specific events that impact competitors of the same business segment. For example, if one firm is criticized for a specific behavior, negative public perception could affect the whole business segment. Therefore,
other firms within this segment get the ability by measuring competitors’ reputation to realize threats at an early stage and to take counter-measures against such risks. Based on the graph in Figure 3, we are able to identify such downturns in the development of sentiment that occur simultaneously or with a small time lag at both Apple and Google.

While most of the measured corporate reputation evaluated and published by the Reputation Institute support our estimated reputation trends based on Twitter sentiments, we get a completely different result regarding the reputation of the Sony Corporation (illustrated in Figure 4). The Reputation Institute determines a positive development of Sony’s reputation based on a strong increase in reputation which results in an improvement from rank six to rank two in the ranking within a year. In contrast, our results provide indication for a decreasing corporate reputation of Sony. Additionally, to examine these different results in more detail we include perceptions of investors as an objective measure of firm performance by extracting historical stock prices for Sony and added the development of the stock price into Figure 4. Since this difference in reputation evaluation is of major relevance for the low correlation coefficient of our overall analysis it gives occasion to consider this phenomenon more precisely.

![Figure 4. Sony’s reputation – is it increasing or decreasing?](image)

For being able to derive the right implications out of this case, it is important to know about some problems Sony was facing in our period of analysis. First, in April 2011 Sony’s gaming and entertainment services were hacked and 77 million customer profiles were stolen. Second, Sony was struggling through weak financial performance. Specifically, Sony’s stock price decreased by 55%. Moreover, the net sales went down by 10% and the net loss for the financial year 2012 (ended on March 31, 2012) almost doubled compared to the previous year. Third, in April 2012 Sony announced to lay off 10,000 employees (6% of Sony’s workforce) as part of a restructuring plan. Based on these events and circumstances Sony was facing, we suggest assuming a decrease in Sony’s reputation to be more plausible than an increase. In particular, due to the fact that Sony focuses on the development of products and services for consumer market, its reputation highly depends on consumer perceptions. In this regard, the reputation institute justifies the positive development of Sony’s reputation by stressing the point that trust of consumers would be still very high which in turn results in a broad reputation profile in almost all of the investigated countries (Reputation Institute, 2012). In contrast, Sony suffers from decreasing numbers of product sales which can be traced back to a loss of customers’ interest and trust in Sony’s products. This is in line with the argumentation, that a negative corporate reputation can cause existential risk for firms (Fombrun and Shanley, 1990; Scott and Walsham, 2005). Based on these findings, we repeated our correlation analysis with a subsample excluding Sony from the sample. As result, the correlation coefficient increased from 0.53 to 0.69 and shows a high significant level ($p$-value = 0.04) although the sample size decreases. This result strengthens the validity of our estimated reputation trends with respect to the remaining firms in the subsample.
4 Conclusion

This study theoretically and practically illustrates how firms might extract and analyze data from social media platforms for enhancing their ability to sense the surrounding environment, seize business opportunities, and react on threats they are exposed to. In particular, we analyzed to what extent stakeholders as well as non-stakeholders communicate their positive and negative perceptions about an organization on a social media platform to assess corporate reputation of a firm. Subsequently, we compared our objective reputation measure with a popular survey-based reputation ranking to check for the validity of our approach. An advantage of our proposed approach is that we can measure corporate reputation continuously over time distinguished from survey-based reputation rankings which are typically conducted in large intervals (e.g., usually annually). This enhances the robustness of our approach against effects which take place within the survey period which might influence survey results excessively or events that occur between two survey periods which would not be covered by a survey. With regard to our empirical findings, we found initial support for our assumption that social media data is a promising source for improving reputation management activities which in turn can be leveraged to improve a firm’s sensing and seizing capabilities. We are aware of the fact that the evidence provided in our research is only the first step toward more sophisticated empirical research in the future which will elaborate on more comprehensive data sets including a greater number of firms as well as a third data point of the reputation ranking to provide further evidence.

From a theoretical point of view, our study provides a helpful foundation for several innovative research directions investigating how new information and communication technologies and platforms enhance dynamic capabilities of a firm. Thereby, we provide evidence for the claim that IT adds value indirectly to firms through facilitating important capabilities such as sensing the business environment and seizing opportunities for competitive action. In addition, future research is needed to further explore which forms of perceptions with respect to different stakeholders can be covered with social media data to understand the phenomenon in more detail. In this respect, we are aware of the fact that our current approach might not take into consideration an appropriate representation of all stakeholders’ perceptions. Thus, data from other platforms that might be heavily used by individuals for sharing their opinions might help to increase the accuracy of our reputation measure. In this regard, future research can extend our approach by collecting and analyzing data from other platforms like Facebook. In addition, this data may be enriched by other sources that might be relevant for assessing corporate reputation such as financial performance measures, results from surveys or publicly available corporate rankings, as well as data available in a firm’s IT-system (e.g., statistics about customer complaints). In this regard, future research should investigate what other microfoundations of sensing and seizing might be improved through analyzing social media or user generated content in general.

In addition, we developed a Java-based system to extract and analyze data from Twitter automatically, offering the results as a digital option to decision makers. Thereby, we exemplarily demonstrate how utilizing IT is essential for extracting information from social media, since a large amount of data has to be analyzed and provided on demand, preferably in real-time for enhancing sensing and seizing capabilities. The integration of our developed procedure in existing professional decision support systems to achieve highly available and on demand information about corporate reputation might already be valuable. However, the data mining algorithms that are applied in our approach offer possibilities for extensions to be able to conduct a more differentiated analysis of social media data automatically (e.g., extending the dictionary with firm specific signal words for subjectivity classification or by use of a supervised sentiment analysis). Such methods would be highly relevant for practice as firms would be able to sense and measure their corporate reputation on a specific issue and hence could respond to turbulences in a more targeted way.
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