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Abstract

The concept of business agility reflects an organization's need to develop sensing capabilities for being able to respond to changes in the business environment rapidly. Therefore, intelligent information systems are needed to support decision makers with accurate and timely information. Since corporate reputation is among the most valuable assets, organizations need efficient measuring techniques for being able to manage it. Recently, due to the advent of social media new reputational challenges have emerged for firms, since such technologies significantly increase the risk for being associated with negative issues. Therefore, organizations should utilize there IT-systems for actively sensing social media content as a basis for a quick response to reputational threats. Accordingly, we provide an empirical example on how firms might improve corporate reputation management through sensing social media. Specifically, we analyze a dataset of 271,207 messages about a large American Bank collected from the public microblogging platform Twitter. For our empirical investigation, we applied automated sentiment analysis and manual content analysis. Our results demonstrate how social media might impact corporate reputation and what organizations can do to prepare themselves. Beyond corporate reputation management, analyzing social media content may be valuable for many other purposes to improve an organization's sensing capabilities.

Keywords: Business Agility, Reputation, Business Intelligence, Social Media, Twitter, Microblogging.

1   Introduction

In today's business environment, organizations are increasingly faced with unpredictable up- and downturns of demand, changing regulatory requirements, strong competition, as well as technological advancements. In order to operate economically and to achieve competitive advantage, such turbulent conditions require firms to continuously adapt their capabilities (Overby et al., 2006). Within literature, an organization's ability to detect and adapt to such environmental changes in a rapid and effective manner is referred to by the concept of business agility (Goldman et al., 1995). In short, the concept suggests firms to actively sense their environment for being able to rapidly respond to occurring changes and to achieve superior performance (Day, 1994; Sambamurthy et al., 2003). Within the last couple of years the question of how information technology (IT) might help in shaping a firm's agility has gained more attention, since the sources which might be sensed and the mechanisms for response become increasingly digitized due to new technological developments (Sambamurthy et al., 2003). In this regard, several authors have called for more research on the role of IT with respect to business agility (Dove, 2001; Overby et al., 2006). Focusing on social media we respond to these calls by applying the concept to a new but rapidly emerging area of research.

Exploring new approaches for achieving business agility we thus analyze how IT might be used to enhance an organization's sensing capabilities through analyzing social media content. Specifically we focus on the management of corporate reputation (CR) which is considered an intangible asset that can contribute to a competitive advantage in the marketplace (Barney, 1991). Moreover achieving a bad reputation is a substantial risk for firms and may lead to loss of customers, suppliers, employees or investors (Fombrun and Shanley, 1990; Scott and Walsham, 2005). In this regard, the emergence of social media platforms such as wikis, blogs, and microblogs significantly increase a firm's risk for being negatively associated with a specific issue (Jones et al., 2009). Users of these new technologies can now spread their opinion freely, unfiltered and at the speed of thought to many other people (Dellarocas, 2003). Since a firm's stakeholders such as, e.g., customers, investors or potential employees increasingly rely on information from these sources, content on social media platforms can significantly impact a firm's business performance and competitiveness (Rindova et al., 2005). Hence, for being able to respond quickly to reputational threats, firms should carefully sense communication on social media sites to achieve business agility in turbulent business environments.

Accordingly, this article aims at enhancing our understanding of how social media can be used to improve an organization's business agility based on the use of IT. Therefore, we conduct an empirical study based on microblogging data to analyze how firms might benefit from sensing social media for CR management. Furthermore, we investigate the role of IT in this context, hypothesizing that achieving business agility through social media sensing essentially relies on the availability of analytical information systems. Hence, we contribute to the literature on business agility, CR and social media in several directions. First, we bring together these distinct streams of research and discuss how IT adds value to business by improving an organization's sensing capabilities. Moreover, to the best of our knowledge, we are the first to conduct a detailed analysis on the value of social media for CR management. In doing so, we contribute to the few existing studies on how organizations might benefit from social media (Richter et al., 2011).

The remainder of this paper is organized as follows: in section two we provide the theoretical background for our research. Thus, we provide a definition and give a broad overview of the literature on business agility as well as CR management. Then we bring both streams together and discuss theoretically how IT might enable business agility based on social media sensing for CR management. In chapter three we exemplarily discover to what extent social media content is relevant for managing a firm's reputation. Based on our empirical results, we then elaborate on how business agility might be affected and to what extent IT would have been needed in practice. We conclude with a summary of our findings and present limitations of our work as well as implications for further research.

2 Theoretical Background

This research combines two distinct streams of literature: the strategic- and IT-management literature focusing on business agility and literature on CR. Therefore, relevant concepts from these domains are briefly highlighted in the following. In the last part of this section we bring both streams together and discuss how firms might utilize social media for managing CR and for achieving business agility.

2.1 Business Agility

In literature, many definitions of business agility can be found, mostly originating from the manufacturing domain. In this regard, Goldman et al., (1995) and Yusuf et al., (1999) elaborate on the term of agility as an organizations ability to perform business within rapidly changing and continuously fragmenting markets. In order to achieve this, firms should focus on producing high-quality, high-performance, customer-configured goods and services (Sharifi and Zhang, 1999). Beyond the manufacturing domain, business agility has been described as a firm's ability to remain competitive in turbulent business environments (Overby et al., 2006). Therefore, organizations need to detect changes and threats in their business environment for being able to respond to them through reconfiguring resources, processes, and strategies rapidly (Dove, 2001). Accordingly, the concept is typically broken down into sensing and responding as the two main capabilities of business agility (Overby et al., 2006). For the purpose of this study, we specifically focus on firms' sensing capabilities which we define as the intellectual ability to sense, detect, and anticipate environmental changes as the basis for responding in an efficient and effective manner (Overby et al., 2006).

Most often, a firm's business environment is changing due to new regulatory or legal requirements, competitors' actions, shifting consumer preferences or technological progress (Sharifi and Zhang, 1999). For being able to handle such changes, Sambamurthy et al. (2003) suggest enterprises develop sensing capabilities to achieve agility on three different dimensions: customer agility, partnering agility, and operational agility. Customer agility reflects the competence of a firm to gain market intelligence by leveraging the voice of the customer. Moreover, partnering agility refers to a firm's competence to build effective networks with business partners and to exploit opportunities coming along with them (Sambamurthy et al., 2003). Finally, operational agility is defined as a firm's ability to identify operational deficiencies or opportunities and to redesign and build new processes accordingly (Overby et al., 2006).

Furthermore, the importance of IT for enabling business agility has gained attention from scientific research as well (Sambamurthy et al., 2003). Although IT may affect agility directly through 'managing by wire', an enterprise's sensing capabilities might be supported in an indirect way through digital options (Overby et al., 2006). In this regard, digital options have been defined as digitized work processes and IT-systems that enhance a firm's knowledge reach and richness. For example, business intelligence systems can provide managers with high-quality information about the state of the business which help them to detect emerging opportunities and threats. Sensing their environment on demand business units might thus obtain rich knowledge related to competitors' actions or customer opinions (Overby et al., 2006). Hence, IT provides digital options, which complement a firm's sensing capabilities thereby enhancing agility and performance (Sambamurthy et al., 2003).

2.2 Corporate Reputation

Within scientific literature CR has been addressed in many different disciplines, such as psychology, sociology, economics, management, and marketing (Fombrun and Van Riel, 1997; Walsh and Beatty, 2007). While many competing definitions of CR are offered within these streams of research, we refer to the most frequently cited definition given by Fombrun (1996, p. 72) who views CR 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". Accordingly, CR can be viewed as a multidimensional construct consisting of the following attributes (Walker, 2010): CR is

based on perceptions, represents the summarized perception of all stakeholders, is issue specific and comparable. The first attribute points to the fact that CR is based on perceptions of people and thus can not be controlled directly (Fombrun, 1996; Rindova et al., 2005). The second attribute highlights the social and collective nature of CR as representing the aggregated perceptions of all stakeholders of a firm (Fombrun et al., 2000; Walker, 2010). In this regard, stakeholders might be external to the company such as customers, suppliers and shareholders or internal as, e.g., employees or a firm's management. Defining CR as issue specific, the third attribute states that an organization may have a separate reputation for different relevant aspects (Walker, 2010). In line with this idea, Fombrun et al.'s (2000) reputational quotient (RQ) defines the following six CR issues: emotional appeal, products and services, financial performance, vision and leadership, workplace environment and social responsibility. Finally, the last attribute states that a firm's CR can be compared with the reputation of its main competitors (Fombrun, 1996). In this regard and in line with the comparative nature of CR, a firm's overall and issue specific CR is typically positive or negative (Walker, 2010).

Consistent with the resource-based view of the firm (Barney, 1991), CR is considered an intangible asset that can contribute to a competitive advantage. In this regard, a positive CR may lead to, e.g., higher customer retention, higher sales rates and a better position in the market (Fombrun and Van Riel, 1997). Moreover, CR may help creating market barriers (Roberts and Dowling, 2002), reducing employee turnover or being successful in the war for new talents (Nakra, 2000). On the other hand, a negative CR may have an opposite effect on all the aforementioned examples and thus bears an existential risk for enterprises (Fombrun and Shanley, 1990; Scott and Walsham, 2005). Therefore, firms need to carefully manage this valuable but very sensitive asset (Walsh and Beatty, 2007). However, the basis for managing CR properly essentially relies on an organization's ability to assess its CR as well as those of its competitors in a timely manner (Jones et al., 2009).

2.3   Sensing Social Media for Corporate Reputation Management

As is typical for IT-based innovations, social media technologies such as blogs, microblogs or social network platforms have dramatically changed the way business is conducted (Kohli and Grover, 2008). Switching from physical to online communication within large virtual networks, organizations are now able to reach audiences of unprecedented scale at a low cost (Dellarocas, 2003). On the other hand, individuals can now make their personal thoughts and opinions on almost anything easily accessible to the global community of Internet and social media users (Jones et al., 2009).

However, the power and the effects of social media platforms have created opportunities as well as threats for organizations with respect to CR (Jones et al., 2009). Specifically, it has been shown that the emergence of technologies such as, e.g., microblogs can accelerate the process for a company to become tarnished or negatively associated with some issue. On the one hand, this can be attributed to the fact that social media platforms allow individuals to spread negative information freely, unfiltered and at the speed of thought to many people (Dellarocas, 2003). On the other hand, the impact of negative content is further intensified by the so-called "negativity effect", which states that negative information is generally greater weighted in the formation of evaluations in individuals' minds than positive information (Baumeister et al., 2001). Since an organization's stakeholders such as customers, investors or potential employees increasingly rely on others' opinions prior to making decisions, firms need to sense their social media environment for being able to avert a reputational damage which might have negative consequences for their business (Rindova et al., 2005).

Fortunately and based on the remarkable ability of the web to not only disseminate, but also collect and aggregate information from large communities at low cost, there is the opportunity – but also the need – for analyzing the digitized and aggregated stakeholder perceptions about a firm on the web (Dellarocas, 2003). In short, the same mechanisms that might threaten an organization can be used for sensing a company's business environment regarding CR. Thus, analyzing social media, firms can enhance their sensing capabilities regarding CR issues and thus improve their business agility which enables them to better respond to reputational threats. Although it may be difficult to obtain relevant

content from all social media platforms available, there are providers such as Twitter for which user data is offered for free. However, for sensing the masses of data available from these sources, intelligent information systems such as decision support systems, data warehouses, and online analytical processing are needed (Kohli & Grover 2008; Overby et al. 2006).

From a business agility point of view, information about stakeholders' perceptions about an organization based on the analysis of social media data can be provided by IT as a digital option. In this regard, knowledge reach is enhanced through integration of this new source of data in a firm's information system. Moreover, the knowledge base for decision making is enriched by using data mining technologies for pattern detection and by timely provision of high-quality information regarding stakeholders' perceptions. This leads to an increased sensing capability which may enhance a firm's business agility by option. Depending on whether business units utilize this digital option, competitive actions may follow, potentially resulting in superior firm performance. Thus, consistent with findings from the IT management literature, the value of social media sensing for firms evolves from the complementarity of IT and business (Kohli and Grover, 2008; Sambamurthy et al., 2003)

3 Sensing Social Media for Corporate Reputation Management: An Empirical Example from the Banking Industry

In this section we provide an empirical example to illustrate how organizations might utilize social media data for sensing their environment with respect to CR and thus to achieve business agility. For this purpose, we focus on the American banking sector which is still struggling as a result of the financial crisis in 2008 as well as recent developments in Europe. In other words, like most banks in the world, American banks have been subject to massive environmental changes in the last couple of years. From a business agility perspective, such turbulent environments require firms to effectively sense their business environment for being able to react swiftly to occurring changes (Overby et al., 2006). One of the most important capabilities of a firm which is based on sensing capabilities is the ability to quickly and efficiently manage CR (Fombrun, 1996; Jones et al., 2009).

In the following, we thus elaborate on the question how social media might be sensed for improving CR management in the banking sector. Particularly, we analyze to what extent users communicate positive and negative perceptions about firms on social media platforms. Applying an issue-specific lens based on Fombrun et al.'s (2000) RQ we further explore how people spread their opinion with respect to six different CR issues. While our approach should be relevant for other sectors, countries and social media technologies as well, for our exemplary illustration we focus on a large American Bank utilizing microblogging data from the public platform Twitter. Our analysis is guided by a three step approach as illustrated in figure 1. The remainder of this section is structured accordingly.
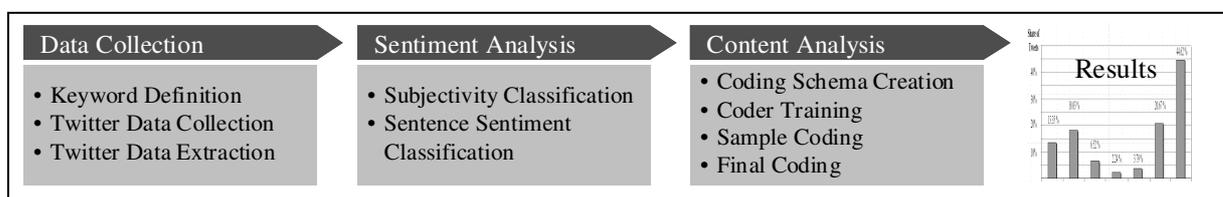

Figure 1: Empirical analysis approach

3.1 Data Collection

For the purpose of our study we collected microblogging data from the public platform Twitter. Since Twitter does not provide functionality to access historical data itself, we used the tool TwapperKeeper (2011) which allows defining archives for collecting messages – also referred to as "Tweets" – that contain specific keywords. As depicted in Figure 1, we thus had to define keywords for the data collection in a first step. In particular we selected the bank's name as well as its commonly used

abbreviations. Then, we created a TwapperKeeper archive for each keyword and started collecting all Tweets from the beginning of June 2010 until January 2011. By adopting a longitudinal approach we made sure to include a diversity of social, economic, and political events. Finally, we extracted a dataset consisting of 271,207 Tweets including metadata such as creation date, user ID, language code, as well as the technical device used for sending the message.

3.2   Sentiment Analysis Procedure

According to its definition, CR is based on stakeholders' perceptions about an organization which are typically either positive or negative (Walker, 2010). Thus for measuring CR, we focused on Tweets containing indicators of positive and negative emotions and perceptions. For that reason we conducted an automated sentiment analysis, as this is an appropriate methodology for "... identifying positive and negative opinions, emotions, and evaluations..." (Wilson et al. 2005, p. 347) from text-based datasets. In general, sentiment analysis is often conducted in two subsequent steps: subjectivity and sentence level classification (Liu, 2010). While subjectivity classification aims at extracting all non-objective messages from a dataset, the goal of sentence level classification is to classify sentences as having either positive or negative polarity. Moreover the strength of polarity is determined as well.

For the subjectivity classification step, we applied a dictionary approach which is typically based on tracking messages for predefined words that signal subjectivity (Wilson et al., 2005; Liu, 2010). Thus, we utilized an existing keyword list "AFINN" (Nielsen, 2011) consisting of 2,477 words which has been explicitly created for sentiment analysis of microblogging messages. Since the list contains English words and phrases only, we first removed all Tweets which were labelled any other language than English. For tracking the presence of all words from the AFINN list in each message of the resulting dataset of 269,826 Tweets, it was necessary to program a script in STATA 12. The rationale for this is that we did not find any open-source software being capable of processing such an amount of data. As a result we identified 123,721 Tweets that contained subjective information about the bank.

Since Tweets are restricted to 140 characters and rarely consist of more than one sentence, the second step – sentence sentiment classification – was conducted on Tweet level. Thus we determined the strength of polarity for each of the remaining 123,721 Tweets. Fortunately, the AFINN list already contains a polarity value for each word on a scale from "-5" (very negative) to "+5" (very positive). However, many Tweets contained more than one word from the list and in some cases these were both positive and negative. Thus, for measuring a Tweet's overall polarity strength, we summed up polarity values of all relevant words in a message (Liu, 2010). As a result, 72,481 Tweets (59%) were classified as negative, while 47,627 (38%) had positive polarity. In 3% of the cases (3,613 Tweets) positive and negative words neutralized each other. Nonetheless, these posts were not excluded for further analysis, since they contain opinion-based information which might be relevant for the bank's CR. Next we computed the average daily polarity of all Tweets sent via the platform on a specific day for exploring how users' perceptions about the bank evolved during our period of analysis. As figure 2 depicts, sentiment is subject to significant fluctuations, while the overall trend indicates a more
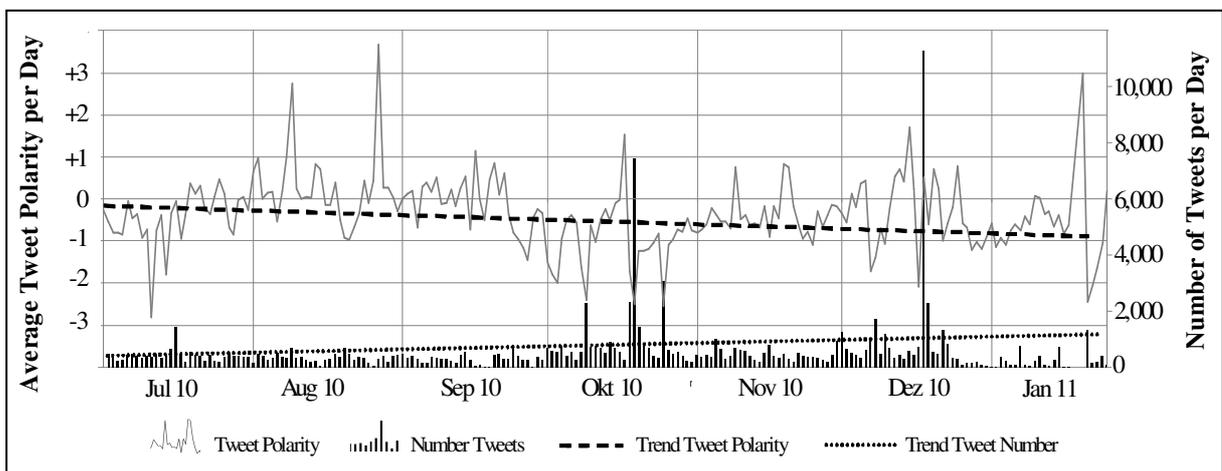

Figure 2: Sentiment and amount of Tweets over time on a daily basis

negative polarity over time. It is interesting to note that polarity seems to be negatively correlated with the number of Tweets. As figure 2 illustrates, the number of Tweets peaks around extremely negative polarized days such as, e.g., in October and December. Accordingly, the trend lines in figure 2 show that the number of Tweets increase while sentiment gets worse. Both observations can be attributed to the "negativity effect" leading users to perceive negative content as more important than positive content thereby increasing the number of Tweets (Baumeister et al., 2001).

3.3   Content Analysis Procedure

For analyzing which specific CR issues a firm's stakeholder share via social media we conducted a manual content analysis on all polarized Tweets. As a method to make systematic and valid inferences from data to the context, content analysis is typically used to classify text into specific categories based on an explicit coding scheme (Krippendorff, 2004). In this regard, we applied a directed content analysis which allowed us to utilize predefined categories from existing theory (Hsieh and Shannon, 2005). During our analysis all actions were guided by an established process (Morris, 1994) for making our analytical approach transparent and to assure reliability and validity of our results and measures. As unit of analysis for the coding process we focused on single Tweets since these are objectively identifiable by independent coders (Rourke et al., 2001).

In a first step, we developed an explicit coding scheme (Krippendorff, 2004), based on the six CR issues as defined in Fombrun et al.'s (2000) RQ. Thus, categories from previous research were adapted to our specific context. For ensuring validity, we conducted intense discussions and asked a panel of 1 practitioner and 2 academics to review our operationalizations. Within this process the coding scheme was revised several times until the final version was created. Operationalizations of all CR issues and examples from our data sample are described in the resulting coding scheme in Table 1.

Second, we trained two researchers in coding the data. This included an overall introduction to the categories of the scheme, instructions for documenting the coding, and a joint coding session for getting familiar with the data. Therefore, we applied systematic random sampling (Cochran, 1977) for generating a representative data sample of 1,000 Tweets. Then, two researchers were provided the sample for jointly coding the data (Krippendorff, 2004). Since training improves a coder's familiarity with the coding scheme this is an important step to assure objectivity of the judges. Afterwards the results were discussed and the coding scheme was revised accordingly.

Subsequently, we started an iterative process of independent sample coding and joint revisions until an acceptable level for all reliability measures was reached (Morris, 1994). Consistent with findings from prior research the size of each reliability sample was set to 1,000 Tweets which were not part of our final research sample (Krippendorff, 2004). Then, the coders independently assigned all posts in the sample to the categories of our coding scheme. Krippendorff's alpha and Cohen's kappa were computed to assess the reliability of the coding scheme and to ensure validity of our results. For both measures we considered a value of more than .70 as evidence for the reliability of our measures (Box et al., 2005). Discrepancies between coders were then discussed and the coding scheme was revised. The process was repeated twice until an acceptable level of intercoder agreement was reached.

After reliability of our scheme was approved, we applied systematic random sampling (Cochran, 1977) for obtaining a representative dataset for the final coding. The rationale for this is that manual content analysis is always subject to the "cost-benefit" question, with a huge amount of data available on the one hand, but limited coder resources on the other hand (Riffe et al., 1998). Thus, we followed Lombard et al.'s (2002) approach and selected 10% of the data for our analysis (12,300 Tweets). Then one researcher started coding based on our coding scheme. After every 500 Tweets we analyzed whether the distribution of the results had changed significantly as compared to the 500 Tweets before. The goal was to determine the point when increasing the sample would not significantly improve the representativeness of our results. Hence, we stopped coding after 2,500 Tweets since distributional differences for each CR issue had reached a value of below .01 (Johnson and Bhattacharyya, 1996).

CR Issues		Operationalization	Examples
Products & Services	Product Consistency and Quality	Brand consistency and ability to stand behind its products (Fombrun et al., 2000)	"We went through a loan mod four times with Bank X and they lost our paperwork each time and we had to start over"
	Innovation	Ability to transform ideas into New or improved products (Baregheh et al., 2009)	"Oh look! Bank X is on Twitter I had no idea!" "Just added text banking and mobile app to my phone for my new Bank X account. Awesome!"
	Utility	Positive perception of having made the right choice (Wang et al., 2009)	"Bank X charges non-customers $6 to cash checks. I shouldn't have opened account there"
	Customer Support	Responsiveness, friendliness, reliability, and promptness regarding customer requests (Blodgett et al., 1987)	"Note: avoid Bank X = bad customer service!" "On an average it takes 2 minutes to get Bank X customer service agent on the phone."
Emotional Appeal	Trust, Mistrust, Respect, Disrespect	Expectation of ethically justifiable behavior (Hosmer, 1995) and adoration of corporate success	"You cannot trust Bank X. What's the point of calling a customer service when they do nothing" "Thank you Bank X for doing what I need "
	Like, Dislike, Adore, Hate	State of pleasure, fondness, enjoyment, sympathy (Fombrun et al., 2000)	"I would like to send hate Tweets to Bank X" "X Bank I hate you"
Social Responsibility	Social Responsibility	Ethical behavior and attitude toward people, helping and developing the society (Fulmer and Barry, 2009)	"Great news! We have been awarded a $20k grant from the Bank X! It will provide 100 chronically hungry kids w/food next yr!"
	Environmental Engagement	Engagement in environmental activities (Fombrun et al., 2000)	"Help animals a little with your next latte! get the credit card from Bank X "
Vision & Leadership	Future Vision	Clear vision, ambitions, challenging long term plan	"Bank X hires two from fidelity to expand retirement business …"
	Management	Past and present quality management team, qualification, experience, leadership style (Fombrun et al., 2000)	"Banks accused of misleading owners: 1 and oct. 15 Bank X and its mortgage-servicing home loans"
	Market Position	Effective use of the market opportunities, reliable strategy, comparison with competitors (Ries and Trout, 2005)	"Well I am officially done with Bank Z next stop either Bank X or Bank Y..." "Bank X saw opportunity but bought a load of trouble home loans for people with bad credit"
	Corporate Governance	Statements about Governmental actions	"Bank X chief tries to inspire improve work force"
Workplace Environment	Good Company to work for	Opinions about employee treatment within the corporation (Walker, 2010)	"Lovely day at work :) (@ Bank X)" "Just started my new position as a corporate instructor for Bank X and loving it!"
	Corporate Infrastructure	Quality of infrastructure (Oldham and Brass, 1979)	"You think Denver airport is creepy take a look at the creepy walls at the Bank X" "This bank looks like a hotel lobby! Awesome!"
Financial Performance	Indicators of Profitability	Financial measures reflecting profitability, liquidity, assets and liabilities of the company	"Accounting tool boosts financial firms' profit: Bank X notched perfect ..." "Bank X reports billion loss"
	Risk	Information or measures of different risk types	"If proven countrywide mortgage fraud could threaten Bank X"
	Growth Prospects	Quantitative measures or financial indicators of future growth	"Bank X tops forecast as credit losses decline: Bank X became the second major bank to… "

Table 1: Coding scheme and operationalization based on Fombrun et al. (2000)

3.4   Data Analysis & Results

As the results of our analysis show, the messages exchanged via the social media platform are a rich source of information regarding a companies CR. In this regard, 55.37% of all Tweets in our data sample contained CR relevant information at least with respect to one CR issue. The remaining 44.62% were irrelevant with respect to our analysis on CR, since these either did not contain any clear information regarding our CR issues or were difficult to understand due to the style of language used. Overall, with 57.55% the majority of Tweets had negative polarity, while every third message had positive content. Moreover, 65% of all relevant Tweets were further forwarded to a greater number of users - so called "Retweets". Figure 3 depicts detailed results of our analysis on CR issue level.
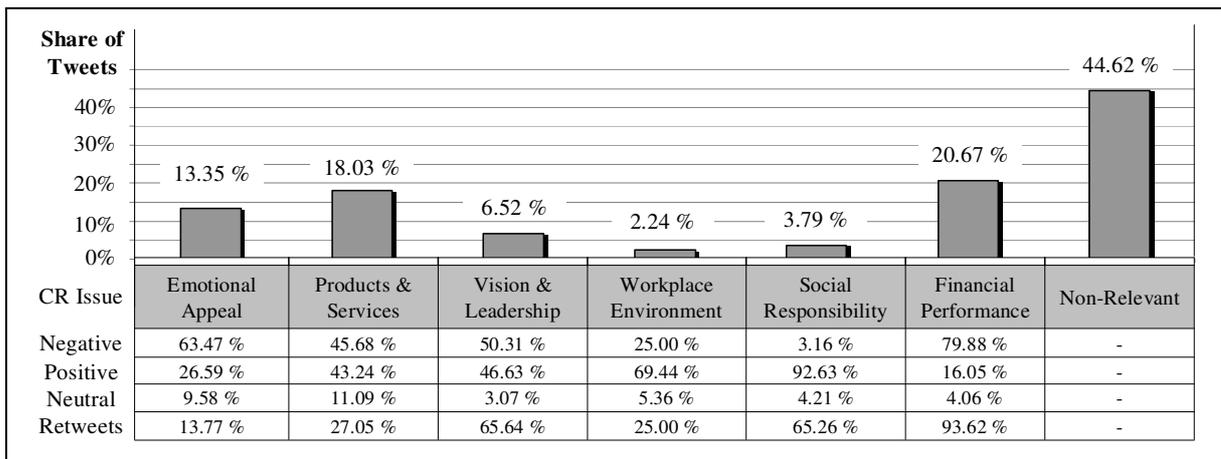
Figure 3: Distribution of CR issues, polarity and retweets in dataset

As illustrated in figure 3, with 20.67% *"Financial Performance"* occurs with highest frequency among all 6 CR issues. On a more detailed level over 70% of Tweets within this category reflect the subcategory "Risk" (54.35%). The importance of stakeholder concerns about "Financial Performance" was confirmed by the tendency to retweet relevant topics more often. More specifically, 93.63% of all Tweets were retweeted to other users. Considering the fact that almost 80% of these Tweets had negative polarity this might be attributed to the negativity effect which leads to retweeting behavior thereby multiplying the impact of negative Tweets on a firm's reputation. With a frequency of 18.48% users discuss CR relevant topics regarding a firm's *"Products and Services"*. According to our results, stakeholders were almost equally concerned about the subcategories "Innovation", "Utility" and "Product consistency and Quality" (all between 15-20%). However, the majority of users express their opinions on "Customer Support" (around 50% of Tweets). In contrast to the "Financial Performance" category, only 27.05% of all messages are being retweeted through the users. Moreover 13.35% of all Tweets are relevant with respect to the CR category *"Emotional Appeal"* and thus contain expressions of stakeholders' emotional perceptions of the company. Reconsidering the negativity effect it is interesting to note that the majority of tweets contains negative content but the number of retweets is rather low as compared to the "financial performance" category. Among the remaining three issues, *"Vision and Leadership"* is mostly discussed on Twitter (6.52%). On a more detailed level stakeholders are most interested in the subcategories "Market position" (43.56%) and "Management" (48.47%). In this regard, it is worth mentioning that users retweet almost every second message out of three. Thus, while there are only few Tweets relevant for this CR issue, their impact might be amplified through retweeting. Moreover, *"Workplace Environment" and "Social Responsibility"* are not of major interest among Twitter users. The majority of these Tweets represent short statements about the bank's activities for society or about employee treatment. Akin to "Emotional Appeal" it should be mentioned that a great share of "Social Responsibility" Tweets (65.26%) are being redistributed through Twitters retweet feature although the majority of tweets is positive. This gives rise to the notion, that the negativity effect might be relevant to specific CR issues only.

3.5   Discussion

In the previous sections we have shown how organizations might utilize publicly available social media data for CR management. The results of our empirical investigation clearly show that platforms such as Twitter are a rich source of information that might impact stakeholders' perceptions about a firm. Content communicated via social media reaches many people and thus might significantly impact stakeholders' perceptions about an organization. In order to prevent reputational damage, organizations should therefore sense social media content for being able to respond to such threats quickly. In this regard, measuring CR on different dimensions enables faster reactions, since assessment of the reasons for reputational loss can be conducted in a more focused way. In our

empirical example we have shown how Fombrun et al.'s (2000) CR issues might be utilized for this purpose. On the other hand organizations might benefit from sensing social media not only with respect to negative developments of CR. Rather, positive shifts of CR may help firms to better learn about their stakeholders' requirements and needs (Day, 1994). This, in turn, might enable better alignment of corporate strategy with an organization's business environment. Finally, it might be worth sensing social media regarding competitors' CR. Identifying reputational weaknesses of competitors should help an organization to achieve advantages in the market through responding to these shortcomings in a targeted and timely manner. In this regard, firms may gain market share through enticing customers (Dellarocas, 2003) or through headhunting their competitors' best human resources (Nakra, 2000). As a result, we suggest organizations enhance their sensing abilities through analyzing social media as this should enable faster responses to environmental changes. Hence, our example shows how organizations could exploit social media data for improving their business agility.

However, while our empirical analysis shows how firms can improve CR management through social media sensing, our example is rather simple, since our goal was to provide a first example for our theoretical and practical statements. Firms have access to additional sources of internal and external data and probably have implemented other processes for CR management (Walker, 2010; Walsh and Beatty, 2007). Moreover, due to the massive amount of social media data available, measuring CR manually is not feasible in a reasonable amount of time and effort. According to the business agility concept, firms in turbulent environments need real-time data on demand to be able to react on changes rapidly (Overby et al., 2006). Therefore, social media data should be integrated into existing CR processes to complement and extend them. Moreover, since content from social media sites is digitized already it can probably be integrated into existing IT-systems in an automated fashion. Applying data mining methods, the data can be analyzed and combined with other information to produce high quality information in a timely manner. Users from business units might then be able to assess CR on demand broken down by specific dimensions. In other words, leveraging their IT to automate the manual process in our example, organizations might be able to enhance their knowledge reach and richness. Business units can then utilize this digital information by option which might lead to a better sensing ability and enhanced business agility (Overby et al., 2006).

4   Conclusion

Contributing to the business agility literature (Sambamurthy et al., 2003; Overby et al., 2006), this research theoretically and practically analyzed how firms might use social media data for enhancing their ability to sense their environment in turbulent times. In particular, we analyzed to what extent stakeholders communicate their positive and negative perceptions about an organization on social media platforms. Moreover we analyzed how these stakeholders provide this information with respect to the different CR specific issues as defined in Fombrun et al.'s (2000) RQ. Overall, we found strong support for our assumption that social media is a critical source of CR relevant information which should be utilized to improve an organization's CR management and more generally a firm's sensing capabilities. Further, we argue that using IT is essential for sensing social media, since the data has to be analyzed and provided on demand, preferably in real-time to meet the requirements of the business agility concept. Thus, intelligent information systems are needed which integrate and analyze these data automatically, offering the results as a digital option to decision makers (Overby et al., 2006). As a result, business agility is enhanced and business units may initiate competitive actions in a better way to achieve superior performance and business value, respectively (Sambamurthy et al., 2003). Thus, we additionally contribute to the discussion of how IT creates business value and provide evidence for the view that IT adds value indirectly through its complementarity with business.

Our argumentation essentially relies on the assumption that firms have access to data about stakeholders' perceptions from social media platforms. We are aware of the fact that such data may not be obtainable for all commercial areas or industries. Moreover, individuals might use platforms and technologies for sharing their opinions that do not offer data for analytical purposes. Thus, the

data available for analysis might not be a representation of all stakeholders' perceptions about the firm under consideration. In this regard it should be mentioned that it has not been analyzed yet whether all stakeholders of a firm utilize social media for communicating their perceptions. However, firms can collect and sense data from Twitter which is one of the most frequently used social media platforms. This data may be enriched by CR relevant data from other sources such as surveys or publicly available CR rankings as well as any other relevant data available in a firm's IT-system as, e.g., statistics about customer complaints or opinions collected via an organization's website.

Combining two distinct streams of literature this work provides a foundation for several new research directions. From a management and IT management perspective it should be analyzed what other sensing activities might be improved through analysing social media. Moreover, the value of other social media platforms should be discovered with respect to business agility and CR in particular. Regarding CR, future research should explore whether sensing social media captures the perceptions of all stakeholders or—if not—of which specific stakeholder instead. Moreover, our results indicate that the "negativity effect" might amplify the diffusion of negative information on social media platforms and thus might be relevant for managing CR. In this regard, more focused research is needed to understand the phenomenon in more detail. From a technical perspective, integration of the data in existing information systems to achieve highly-available and on demand accessibility might be of interest just as the inclusion in existing procedures for knowledge generation. Beyond our research, specific data mining algorithms should be developed and applied for being able to conduct the manual part of our analysis automatically. Such methods would be highly relevant for practice as firms would be able to sense and measure their CR on issue level and hence could respond to turbulences in a more targeted way.

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