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Sentiments in Leader's Social Media Communication: Analyzing the German Chancellor on Instagram during COVID Pandemic

Abstract

Social media has a tremendous reach with about 3.5 billion users around the world. Therefore, also governments are already using social media platforms to reach out to their citizens. During the COVID-19 pandemic, the contact restrictions and lockdowns intensified people's need to rely on digital and social media. One method to explore this communication is referred to as "sentiment analyzes," which attempts to automatically discover the underlying attitude about a certain entity. In this study, the social media communication of the chancellor of Germany was monitored during March 2019 and March 2021, and 610 posts towards the German citizens were collected through the analysis of APIs and Web Scraping techniques. This research will analyze the chancellor's communication on social media before and during the covid pandemic. In order to examine how social media communication was affected in uncertain contexts and its impact on the sentiments transmitted to the German society during the COVID-19 pandemic.

Keywords: Sentiment Analysis, Text Analysis, Natural Language Processing.

Introduction

By March 11, 2020, the World Health Organization (WHO) had declared the outbreak of SARS-CoV-2 infections as a global COVID-19 pandemic, resulting in hundreds of thousands of deaths. Further, Covid-19 impacted many people, organizations, and companies. However, not every country was equally affected by the pandemic, and some countries were relatively successful in containing the spread of the SARS-CoV-2 virus. One year after the WHO declared a pandemic on 11 March 2021, Germany had approximately 106 new COVID-19 cases per 1 million citizens, Austria had 274, the United States had 168 and Brazil had 325 (Roser, Ritchie, Ortiz-Ospina, & Hasell, 2020). Numerous factors contribute to each country's success in lowering these figures, including government-led initiatives, wealth, and geographical isolation. According to Hyland-Wood et al. (2021), effective communication and leadership are critical components of pandemic management.

It is critical that people have information about what is known and unknown during a pandemic, especially when health risks are unknown. As a result, citizens require guidance in order to safeguard their own and others' health. It is critical that communication and information sharing between government and local health officials reduce fear, increase public trust and mitigate confusion (Reynolds & Quinn, 2008).

During the last years, social media had a phenomenal growth and success. There are around 3.5 billion social media users around the world. The social networking website Facebook has reportedly reached about 2.4 billion active users worldwide. Because of that tremendous reach, governments around the world and across different levels are adopting social media at a rapid pace (Gintova, 2019). They are increasingly using social media to connect with

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those they serve (Bertot, Jaeger, & Hansen, 2012). One of the most famous government communicators which used social media is the 45th president of the USA Donald Trump, who uses preferably Twitter and tweeted during his presidency 25.000 times to reach out to his citizens (Vazquez, Hickey, Krishnakumar, & Boschma, 2020).

The digital era also referred to as the information society, is characterized by an exponential increase in the amount of accessible information. The current generations have nowadays countless social media portals which they can use, an insatiable appetite for information sharing, and limitless options to connect with others, especially among younger generations. Therefore, the amount of user-generated content on social media is fast increasing and is projected to continue expanding in the near future. This kind of web-based data is being more acknowledged as a vital source of information for a wide range of application domains (Schouten & Frasincar, 2016).

This article focuses especially on the social media communication of the chancellor of Germany by analyzing the provided sentiments to its citizens during the COVID-19 pandemic and comparing it with the posts before the COVID-19 pandemic. This research aims to explore how the governmental leader of Germany has communicated on social media during the COVID-19 pandemic and what emotions have been provided to the citizens.

Literature Review

Social media can be conceived of digital instruments or applications that promote and encourage collaborative communication between audiences and organizations through a content exchange. Mayfield (2006) defines social media as a form of human communication that demonstrates transparency, engagement, dialogue, community, and connectedness. Comparing various scholars reveals that there is no universally accepted concept of social media in government. In other words, social media is a collection of technologies that allow public bodies to interact with people and other organizations through the use of Web 2.0 technology (Criado, Sandoval-Almazan, & Gil-Garcia, 2013). Until now, approaches have emphasized the social dimension of Web 2.0 technologies, in which individuals take an active role in developing, commenting on, posting, coordinating, and ranking Web content as part of a social network through interaction and linking (Chun, Shulman, Sandoval, & Hovy, 2010). Governments around the world are altering their public agency landscapes as a result of social media tools (Criado, Sandoval-Almazan, & Gil-Garcia, 2013).

Sentiment analysis or sometimes called opinion mining is a subfield of natural language processing (NLP) that entails automatically classifying a text's sentiment, which is often classified as positive, neutral, or negative. It has grown in popularity in both research and business as a result of the vast and growing volume of opinionated user-generated content on the Internet, such as social media and product reviews. Natural language is often ambiguous and incorporates metaphorical terms or sarcasm, which complicates the automated extraction of information in general (Hoang, Bihorac, & Rouces, 2019).

Social Media as a Government Communication Channel

Citizens are increasingly using social media to communicate with friends, family, coworkers, and the government. Facilitating interpersonal communication, initiating group interactions with citizens, and receiving immediate feedback create new opportunities for elected officials and government to inform and be informed by citizens. Social media communication channels have also been adopted for a variety of purposes, one of which is to overcome communication barriers that are frequently encountered in the public sector (Hofmann, Beverungen, Räckers, & Becker, 2013). Several authors have noted that by utilizing social media among government agencies, the public sector can improve communication, citizen engagement, transparency, trust, democracy, and the transfer of good practices. (Bertot, Jaeger, & Hansen, 2012; Criado, Sandoval-Almazan, & Gil-Garcia, 2013).

One major source of friction in the relationship between government and citizens is a lack of trust, which can be improved primarily through transparency, engagement with stakeholders, and effective action. Thus, government use of social media must be viewed as a paradigm shift aimed at increasing citizen participation and empowerment through increased government accountability, transparency, and open collaboration (Bonsón, Royo, & Ratkai, 2014). According to Snead (2013), the public sectors are adopting social media in response to historically low levels of citizen trust, confidence, and involvement with government activities and democratic processes. Thereby, social media enables governments to engage directly with their target audience and provides an innovative channel for participation that integrates citizens, promotes transparency,

and has a much broader reach than a traditional, static website (Bonsón, Royo, & Ratkai, 2014).

Government communication serves an educational function by informing citizens, and Gebauer (1998) defines it as public relations for policymaking and to justify or explain government decisions. The government, represented by elected officials, is required to inform citizens about its actions, as political behavior and policy decisions require public justification (Gebauer, 1998). Government communication, according to Hill (1993), should assist and inform citizens in exerting influence and participation in government activities, proposals, and decisions. Citizens should have access to and approval or rejection of government decisions, actions, and proposals that affect their daily lives. To legitimize their actions, governments must inform their citizens. Previously, the government addressed them primarily through press releases and made them public through radio interviews, newspaper articles, and television appearances. Since social media is rising, Governments are expanding their options for educating and engaging with the public in order to fulfill their needs and expectations (Borucki, 2016). It is critical for effective communication that governments interact with their people, but also how they communicate and, most importantly, how their communication is interpreted by their citizens. Communication via social media does not guarantee successful communication; prior research has demonstrated that traditional 'offline' communication cannot be directly transferred to social media communication channels due to the fact that social media interaction follows certain patterns (Hofmann, Beverungen, Räckers, & Becker, 2013).

Despite these potential benefits, not all technological advancements or adoptions are entirely beneficial (Farazmand, 2012). Farazmand (2012) characterizes technology as both an enabler and a destroyer, a platform capable of enabling and repressing liberation and tyranny, progress and decay, and democracy and despotism. Several of these negative aspects include the growth of fake news, which has increased exponentially since the rise of social media, and the censorship of social media channels in various countries.

Crisis Communication

The term "crisis management" refers to the process of optimizing a society's capacity to prevent and absorb extreme events. To manage crises effectively, stakeholders such as policymakers, government officials, and leaders must maintain citizens' attention, trust, and confidence. Mensah and Adams (2020) emphasized the importance of trust in the implementation of government projects. By contrast, buzz words foster trust and credibility, which are necessary for influence and self-preservation (Boin, Stern, & Sundelius, 2016). A survey of public opinion conducted in Switzerland to ascertain how political leaders or the government are treating the coronavirus (COVID-19) outbreak discovered that 40% of the sample had a high level of confidence in political leadership (Koptyug, 2020). Building trust between government, leaders, and the public is related to influencing the public through the use of diverse media platforms, where information is shared in real-time and in two directions (Park, Dongsuk, Rho, & Lee, 2016). In a crisis, trust in political leaders is critical, as mistrust can impede crisis management and recovery (Kaur, Verma, & Otoo, 2021).

Crisis communication is critical in risk situations because it ensures an open and transparent relationship between the various flows and transmissions of information and communication, which is the foundation for collective action. However, crisis communication is not only about sharing knowledge; it is also about developing strategies for disseminating comprehensive information that represents confusion and allows the public to make fact-based decisions about, in this case, health (Gesser-Edelsburg, Shir-Raz, Hayek, & Sassoni-Bar Lev, 2014).

Social media has been a catalyst for transforming crisis communication (Graham, Avery, & Park, 2015). The aim of crisis communication is to get the right information to the right people quickly, and social media facilitates this process (Graham, Avery, & Park, 2015). Leaders cannot immediately disseminate information during a crisis. At the beginning of a crisis, leaders gradually exchanged information to educate, warn, and plan citizens' mental health. This enabled the public to make an informed decision and avoid panic (Kaur, Verma, & Otoo, 2021). Additionally, leaders must make difficult choices and seek the assistance of the public, governments, and other stakeholders in order to carry out crisis decisions. They will have to provide meaning in order to increase the credibility of the information by considering "what the crisis is about", "what is at stake", "what are the causes" and "what can be done" (Boin, Stern, & Sundelius, 2016).

When a crisis begins, information gaps can be created, and the government, politicians, and organizations can collaborate to close them by creating and sharing information that is frequently required in real-time (Liu, Fraustino, & Jin, 2015). After the bombings at the 2013

Boston marathon, "The Boston Globe" converted their homepage temporarily into a live blog that pulled so-called "tweets" from the social media platform, Twitter, which was created by the government, news outlets, and citizens (Gilgoff & Lee, 2013). During times of crisis, the public uses social media at a higher rate, as they increasingly rely on these immediate interactive channels for information and emotional support.

According to an American Red Cross (2011) survey, Americans are becoming increasingly dependent on social media and mobile devices to learn about current disasters, request assistance, and exchange information after emergencies. Further, the audience's use of social media rises during times of crisis, and social media are often perceived as more credible outlets than traditional mass media. According to Liu, Fraustino, and Jin (2015), no social media platform is preferred for disseminating information about the crisis. That continued investment is essential to ensure that a variety of communication channels are used.

Previous research has examined social media as a valuable tool for governments, agencies, communities, and the general public to share knowledge during times of crisis. (Guo, Liu, Wu, & Zhang, 2020). Additionally, language and tone of communication aid followers in making sense of their perception of the emergency.

Emotions and Crisis Communication

According to (Boin et al., 2016), communication via social media is critical for estimating and maintaining mental health conditions during an "undesirable" and "unexpected" situation. According to researchers, political leaders' strategic use of emotions for communication in elections is determined by how they choose to present themselves to the electorate in order to obtain similar feelings from the audience, as the political leader's emotions have a significant impact on the public (Paul & Sui, 2019). Furthermore, leaders are judged on their responses to situations indeed, even the shortest expression of emotion, lasting about a second, can influence the passionate reaction of adherents (Stewart, Waller, & Schubert, 2009). As a result, emotions in communication may become increasingly influential in affecting supporters. Any inappropriate nonverbal expression in the form of emotions, on the other hand, may backfire during a crisis and thus must be carefully articulated.

Barsade (2020) emphasized the contagious effect of positive emotions on the development of a positive attitude. As a result, it is critical to identify emotions when communicating on social media platforms in order to foster a positive environment. Boin et al. (2016) asserted that not only doing the right things but also communicating them in the right opinion or sentiment strengthens a leader's capacity to lead during times of crisis.

People generally follow leaders who share their ideologies, exerting significant influence and agreeing with the social media content posted or resonating with the emotion expressed in such content. Individuals are more likely to engage with humorous and motivational posts than with messages containing fear and anger (Borah, 2016). Given this evidence, those who follow a leader on social media are likely to echo the sentiments expressed in the leader's content. Lewis (2000) also examined leaders' emotions and their effect on followers through the use of videotaped speeches and discovered that neutral emotions are more effective than angry or sad emotions. Additionally, leaders who demonstrated negative emotions generated less enthusiasm among their followers. As a result, emotion detection is a critical area of study in crisis leadership communication. According to Covello et al. (2001), risks associated with anger, sadness, fear, or mistrust would be viewed as greater than risks associated with other emotions. For government entities or organizations lacking in legitimacy and confidence, such feelings will intensify in the presence of trustworthy agencies or institutions.

Theoretical Framework

Depoux et al. (2020) described that Social Media could help to fight infectious disease outbreaks. Further, it is important due to its tremendous role in analyzing public sentiment. Following researchers. As described in the introduction, the covid pandemic is a current topic. Therefore, there is not that much literature yet, but the following authors have already made some contributions in this research area:

The author Kuar et al. (2021) already did research in this area but focused on Indian leaders, i.e., the chief minister of all India states on Twitter, within a period of 54 days. This time period seems to be quite short in comparison to other research in this area. To analyze the emotions of the communication, NRC Lexicon was used, which has a lower accuracy than Machine learning approaches (van Atteveldt, van der Velden, & Boukes, 2021).

The Author de las Heras-Pedrosa et al. (2020) focused on their research on Spain and Spanish society during the COVID-19 pandemic.

They gathered all communications on Twitter, YouTube, Instagram, official press websites, and internet forums during march and April 2020. They used IBM Watson as a proprietary method to analyze sentiments.

Imran et al. (2020) investigated during February 2020 until end of April 2020 on twitter communication of several countries that included the marker #coronavirus, #coronavirusoutbreak, #coronavirusPandemic, #covid19, #covid_19. Emotions between 3 continents and six countries (Sweden, Norway, Canada, USA, Pakistan, and India) have been done. The sentiments were analyzed by using a Keras machine learning approach. Results showed that even being neighbor countries with similar cultures could lead to a different polarity of emotions than other neighbor countries. In this research, it was claimed that other social media platforms and posts in local languages could reveal more interesting patterns related to the pandemic.

Lastly, no study has previously analyzed how the German governmental leader communicated on social media during the COVID-19 pandemic. Especially by analyzing the provided sentiments from the chancellor of Germany through Instagram text addressing its citizens. Further, no sentiment analysis in the context of COVID-19 has been conducted within a longer timeframe. Therefore, the chosen time frame for examination will be between 30th of March 2019 until 30th of March 2021. A time period of 2 years seems to be sufficient since in comparative scientific work, a duration of 1 year or less was also chosen (Gintova, 2019).

The aim of this research is to analyze the sentiments of the social media communication of the governmental leader of Germany by using a modern and state of the art NLP software which is based on Machine Learning techniques. In order to reach this aim following research questions will be answered: (RQ1) did the COVID-19 communication dominate the social media communication of the chancellor of Germany, (RQ2) What sentiment did the chancellor of Germany transport towards their citizens before and after the COVID-19 pandemic and (RQ3) What impact had the COVID-19 pandemic on the sentiment of communication towards the German society? The results of these research questions could give further insights into how the COVID-19 pandemic has affected the communication of the governmental leader of Germany and what sentiments have been provided during this crisis. What will not be analyzed are other social media platforms or reactions (comments) of communications from citizens.

Methodology

Data Collection

This research collected data directly from Instagram, which is the only social media platform that the chancellor of Germany uses. The account of the chancellor is called "Bundeskanzlerin". The data collection includes posts from March 30th 2019 until 30th of March 2021, which were collected using a python script and the official API. The sample includes 610 obtained communications from the chancellor towards her audience. Further, the texts were pre-processed so that hyperlinks and emoticons were removed so that the Natural language could be processed.

Sentiment Analysis

In this research, a state-of-the-art sentiment analysis method is used. Bidirectional encoder representations from Transformers (BERT) is a pre-trained language model which is developed to consider the context of a word from both left and right sides simultaneously.

BERT as a pre-trained language model was trained with about 25.000 datasets and tested with additionally 25.000 datasets, which improves its accuracy. In previous research, the machine learning approach with BERT was evaluated and had delivered better results than other approaches (Gao, Feng, Song, & Wu, 2019). The NLP approach BERT combined with the enormous data set achieves an overall f-measure of 0.87, with the f-measures for the negative and positive sentences reaching 0.91 and 0.78, respectively, a significant improvement over the state-of-the-art (Biswas, Karabulut, Pollock, & Vijay-Shanker, 2020). The classification of BERT is not just positive or negative. It can also classify the sentiment on a 5-point scale, which includes: (1) strongly negative, (2) weakly negative, (3) neutral, (4) weakly positive, and (5) strongly positive.

Results

Figure 1 demonstrates a word cloud which represents the main topics and often used words of the social media communication mainly was between March 2019 and March 2020. As you can see, the communication was mainly self-centered, which indicates that the social media channel was often used to promote herself and her work towards the citizens.

Figure 1.

Word cloud generated between 30 of March 2019 and 08 of March 2020

Figure 2, in contrast, demonstrates how the communication of the chancellor slightly changed. The chancellor of Germany is still often mentioned, but corona comes already in the third place of the often used words towards the German society.

Figure 2.

Word cloud generated between 9th of March 2020 and 30 of March 2021

Figure 3 shows the two boxplots. The left one represents the sentiments between 30th of March 2019 until 9th of March 2020 (before the COVID pandemic) and the right one between 9th of March 2020 until 30th of March 2021 (during the COVID pandemic). As we can see, the results of the boxplot show that the median is on both sides at four, which means that the median is weakly positive. The difference is that during the COVID pandemic, a lower quartile between neutral and weakly positive.

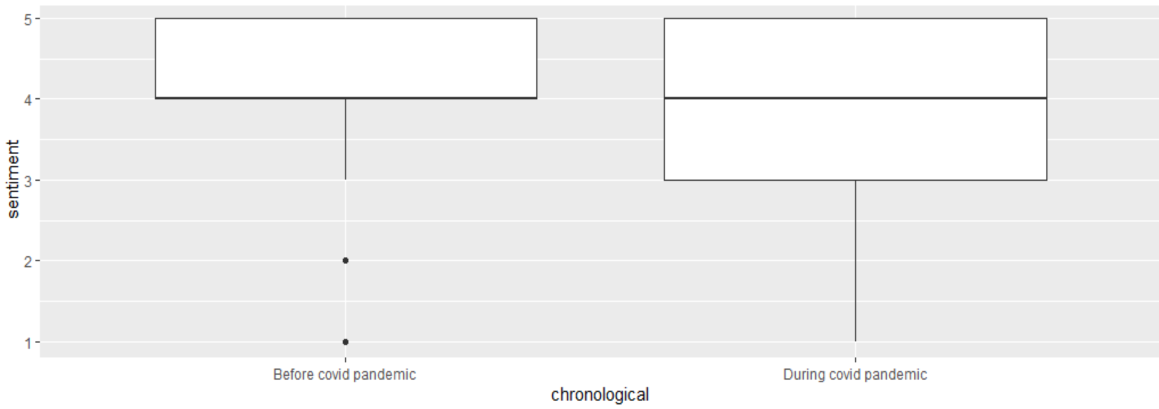

Figure 3.

Boxplots before and during the covid pandemic

By performing the welch T-test in comparing how the sentiment was influenced by the covid pandemic, the result is t(439,85) = 2,776; p-value of nearly 0.006, which means that we can reject the null hypothesis with a statistically significant p-value. To analyze the effect, Cohen's d was applied, which resulted in 0.23, which means that there is only a small effect.

Discussion & Conclusion

Conclusion

The pandemic caused fear and uncertainty among the population. By failing to adjust to specified boundaries, this sort of crisis emphasizes the importance of risk communication when developing effective strategies. The analysis of the communication

from the chancellor of Germany on Instagram shows that the messages emitted were mainly with a positive tone, but even during the Covid-19 pandemic self-cantered. Therefore, we can answer (RQ1) as that the communication wasn't dominated by covid communications and that it was only often represented during the Covid-19 pandemic. Further, the median sentiment was before and during the pandemic weakly positive, but the communication was during the pandemic more distributed between negative neutral and positive sentiments. Therefore, we can answer (RQ2) that the sentiment wasn't as positive as before the pandemic started. (RQ3) can be answered that the COVID-19 pandemic had a small effect on the sentiments which were transmitted to the population.

Limitations and Recommendations for Future Studies

One major limitation of this study is the nature of the Instagram dataset itself and that only this data was analyzed. First of all, this dataset only considers English and German language tweets. Additionally, the current data is limited to March 30th 2019 to March 30th 2021, with about 610 posts. A bigger sample would give further insights. Secondly, only text was analysed in this research. Including video and images would give a much precise insights into the sentiments. And the third limitation is that the other side (German society) wasn't analysed by scraping the comments of their posts. It might be a future research area to perform also sentiment analysis of the responds of the society on how they respond based on the provided sentiment. Limitations of the current study can be improved in future studies.

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