

SOCIAL MEDIA ANALYSIS DURING JEDDAH'S FLOOD PERIOD 2009 -2018

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ABSTRACT

Effective communication is crucial in times of organizational crisis. Sharing information efficiently before, during, and in the aftermath of the crisis is essential in mitigating its probable impacts. The main actors in the crisis communication and management process are the public and the government. However, the specific roles of these key actors are not explicitly defined. The current study seeks to investigate the engagement of the government and the public in social media platforms, after the Jeddah floods that were reported in the year 2009 and 2011. Information drawn from Facebook posts and Twitter tweets was subjected to qualitative content analysis to comprehend the views of the users of the platforms. From the analysis, it was observed that public communication during the crisis primarily focused on providing details about the scope, background, causes, and potential solutions to the situation. Additionally, the study found a notable prevalence of multimedia attachments, such as photos and videos, in social media posts. In conclusion, the research determined that the public played a pivotal role in crisis communication during and after the Jeddah floods.

Keywords: Jeddah, Floods, Crisis, Communication, Social Media.

1. INTRODUCTION

A Pakistani citizen named Farman Ali Khan lost his life tragically in November 2009 to rescue flood victims. While speaking to the Arab News' journalists, his father Umar Rehman, indicated that he was selfless. He reported that "*Since childhood, Farman understood the importance of coexistence. He taught us that those who dedicate themselves to others leave behind a legacy, even if their spirits embark on a different journey. Farman lives on, etched in our hearts, and cherished in our memories*" (Khan, 2019). Individuals like Farman, who altruistically aided others during the floods in Jeddah, will forever hold a special place in the hearts and recollections of those they touched.

Jeddah is a town located on the Eastern coast of the Red Sea. The city is considered one of the largest seaports and the most renowned metropolitan area in Makkah Province West Saudi Arabia. The town has a population of four million and thus qualifies as the second-largest city in Saudi Arabia after Riyadh which is considered the largest city ("*Jeddah Facts & Figures,*" 2017). While Jeddah is situated in a semi-arid weather zone and is marred with hot temperatures, it is considered an important city in the Middle East. The strategic location of the metropolitan is significant for the development of capital and investments. Further research has also shown that the existing weather patterns in the town are not easily predictable. The probable certain changes in the patterns of weather are likely to have adverse implications for the people. Amour (2017) in their study reported that the ever-changing climatic conditions across the globe, and the high chance of significant growth in the population, expose individuals to adverse effects of natural disasters including floods, tsunamis, and droughts.

The location of Jeddah city exposes it to many natural disasters. The city is situated in the coastal plains, bordering the Red Sea on the west, and being exposed to other mountains on the East. Consequently, the runoff from the mountains flows into the city through different drainage pathways. With intense rainfall, most of the runoff flows in a different direction westward from the hills towards the Red Sea, thus leading to flash floods that are experienced by the areas along the various drainage pathways (Youssef et al., 2016). Though Jeddah has previously experienced higher amounts of rainfall (for example, the city received 83mm

of rain in November 1972), the city has only encountered two major flash floods—the first one was reported on November 20, 2009, and the second one was encountered in January 2011. Both flood waves had precipitation values that were measured above 60mm, the precipitation lasted for more than three hours (Youssef et al., 2016). The suddenly high amount of rainfall encountered in the city within the short period caused the floods.

Two instances of flooding were reported in Jeddah city that resulted in the significant loss of lives. Serious damage to property was also reported in the aftermath of the floods. The loss of lives and extensive damage to property occurred significantly because of the submerged roads which also led to the loss of many vehicles. In the year 2009, the floods resulted in the loss of 123 lives, this number was higher than the number of lives lost in the year 2011 (Davies, 2013). In the two instances, the lack of preparedness and the inadequate crisis management systems put in place by the management have exacerbated the situation and the impact of the catastrophe on the people (Abdullah & Othman, 2015). The government has mostly been involved in the evacuation of individuals after the flooding, with minimal efforts being put to prevent the occurrence of the ordeal. Lasting solutions to prevent the recurrence of the problem have not been implemented. The failures of the authorities to put up measures that would focus on mitigating the recurrence of the flooding have made the issue a yearly menace that the residents must face. Consequently, these residents constantly call for the implementation of a more effective and sustainable strategy that would reduce but not eliminate the chances of the recurrence of the floods.

Purpose of the study

The current study analyses the information availed in social media in the aftermath of the floods witnessed in Jeddah city. The analysis is focused on exploring the accounts of the witnesses and the survivors of the floods, that claimed more than 123 lives, displaced about 20000 people, and caused significant financial losses to the tune of billions of dollars. The study also examines the 2011 flooding incidence, which also claimed the lives of at least 10 individuals, and displaced more than 1500 families (Davies, 2013). The two incidences of floods spurred major discussions on social media platforms. Consequently, the purpose of this research is to analyze the responses of both the public and the government to the floods and the views and sentiments of social media users. The central idea is to explore how the government and the public responded to the floods using social media and assess the effectiveness of the platform in aiding the management of such catastrophes. The findings of the study will assist the management of Jeddah in understanding the perspectives of the people on the causes of the floods and the most effective measures that can be adopted in managing the floods as well as preventing its future recurrence.

The Rationale of the study

The primary goal of the current study is to investigate the role of social media as a communication tool before, during, and after an organizational crisis. The process entails the conveyance of different kinds of information such as advance warnings, appeals for assistance, and very crucial details about the type and severity of the disaster. The dissemination of information on the need for help, the kind of available volunteer help, attributions of blame, tips for disaster prevention, and plans for recovery are also provided through social media platforms. Consequently, this study seeks to understand the process of information flow and how the public and the government as well as other authorities respond to suggestions put forth by the public.

Previous studies on floods in Jeddah have predominantly concentrated on either the causes, consequences, or the actions and oversights of the authorities in managing the situation. There has been limited exploration of how both the public and authorities utilized social media platforms in response to the crisis, despite the significant attention Saudi citizens devote to social media networks. Approximately 23 million Saudi citizens actively engage with social media (Lama, 2019). Given this substantial activity on social media, Saudis are well-positioned to voice their opinions and recommendations in the event of disasters like the Jeddah floods.

It is imperative to review the research conducted by other scholars regarding the Jeddah floods. The researchers in this study will identify any existing gaps in information, which will be analyzed within the framework of image restoration theory and the four channels model. Examining past research is crucial in shaping and guiding the research process, providing a benchmark for data analysis.

2. LITERATURE REVIEW

2.1 Theoretical background

The current study adopted two theoretical underpinnings that included the image repair theory and the role of social media in the crisis communication model. Both theories are vital in explaining communication within the context of the group. The two models identify the functional importance of communication in an organizational context. Further, they avail insights into the effectiveness of proper communication in the aftermath of a crisis. A discussion of the two theories, in the context of this study is availed below.

Image repair theory. It is a key concept in explaining the process of communication in organizations such as corporations, government agencies, and profit and non-profit groups. The term "*image*" in this context does not solely mean the initial impression that people may have towards an individual, an object of an occurrence. Rather, it is considered a significant term in public relations (Benoit, 1997). Organizations are thus needed to develop suitable strategies that would protect their image in the eyes of the public. Nevertheless, there are certain instances when an organization may error in its process of safeguarding the public image. Consequently, there is likely to be scrutiny and public backlash that would derail their reputation. Issues such as inadequate finances, and limited time and space for effective communication have been cited as the major causes of poor protection of image. However, factors beyond the organization such as natural disasters may also prevent the organization from adequately addressing any crisis. Mistakes are also likely to abound and may require the organization to address the same, in the process of saving its image. The effectiveness of the process determines whether a positive or negative outcome will be achieved (Graff et al., 2005). Despite the challenges and limitations, organizations always strive to safeguard and maintain a positive image.

Different approaches have been proposed that can be employed when addressing a negative image. In the study of the discourse of image restoration, these approaches have been discussed (Benoit, 1997). It is reported that the approaches are effective in different situations and organizational contexts, thus an evaluation of the same is desired before settling on the most feasible method for the organization. The theory of image repair was first coined and employed in explaining different happenings in the fields of social and political sciences. Later, the theory was adopted in the study of crisis management in public relations (Holtzhausen & Roberts, 2009). Since then, many scholars have adopted the theory in explaining and understanding different crises that involved governments, celebrities, and politicians (Sellnow & Seeger, 2013). Therefore, according to the theory, image restoration plays a vital role in society and serves as an avenue for building of a positive business reputation.

Based on the theory of image restoration organizations are involved in the use of various strategies to mend their damaged reputation. Besides, restoring, earlier studies such as Benoit (1997) introduced the term "*repair*" instead of "*restore*," and indicated that the reputation of the organization may not fully return to its original state, nevertheless, organizations are still mandated to address and manage the crisis. Benoit and Pang (2008) also reported that an organization may choose one of the following actions in response to a crisis:

Denial: The organization can choose to blame others for the crisis or dismiss the crisis (Sellnow & Seeger, 2013).

Avoiding responsibility: In case ignoring the crisis is not feasible, the organization can decide to avoid addressing the crisis. Avoidance is achieved when the organization refrains from acknowledging the existence of the crisis, or when it lessens its responsibility to address the challenges and issues of the crisis.

Lessening negativity: it is ensuring that the company evades and addresses all the negative sentiments labeled against it in the aftermath of the crisis. This can be achieved through six main strategies: emphasizing the positive attributes of the company, downplaying the severity of the act, highlighting

distinctions from similar acts, contextualizing the act as beneficial, challenging the accuser, and providing compensation to redress the act, satisfying the victims.

Corrective action: entailing the efforts that are put in place to address and manage the crisis through two main methods. Reinstating the situation to its pre-crisis state and committing to implementing changes to prevent a recurrence. While an apology coupled with corrective action enhances the organization's response, it may not always be obligatory.

Mortification: the organization publicly admits guilt and responsibility for the wrongful act, seeking forgiveness. If the audience perceives the apology as sufficient, they may pardon the transgression. Combining this approach with corrective action can be effective.

Four channels model: The current study is also based on the four channels framework. According to Sellnow and Seeger (2013), effective communication is needed for a community to adequately respond to and discuss a crisis. The four-channel model highlights the benefits of effective communication during a crisis. The model acknowledges the importance of public views and ideas when addressing and responding to a crisis. Central elements of this model include individuals and their utilization of communication channels. The media is considered part of the public because it offers a platform for people to share their experiences. People play a vital role during a crisis, particularly in the age of social media, as they derive benefits from discussing issues and seeking causes. Communication by the public through platforms like Facebook, Twitter, and YouTube heightens their role in disseminating information. Social media platforms have empowered the public by providing them with a powerful channel to express their opinions and influence organizational decisions. This phenomenon is well-demonstrated in Sonbul's (2023) study, which analyzed social media reactions to advertising. Thus, the information availed through the platforms should be relevant and significant in the process of responding to and managing a crisis.

2.2 Causes of floods in Jeddah

Jeddah has faced the flooding disaster although it is located in a dry area. Pradhan et al. (2016) state that Jeddah experienced floods in 2009 and 2011 because of two main reasons: geomorphological conditions and people's actions that exacerbate the crisis. Also, Jeddah's location contributes to loss in people's lives and property damages. Some Jeddah sides were impacted by floods more than others, and some properties were destroyed by the speed and power of the surface runoff. Another reason responsible for the loss of lives was building the houses in some urban areas in very low areas besides waste pathways. Also, the level of the rainwater the city experienced as well as climate change contributed to the floods (Pradhan et al, 2016). Because of that, the negative effects of the floods should not be entirely attributed to the people.

Large amounts of rain increase the danger of floods. Tekeli (2017), noted that geography, soil moisture, and construction of the lands in Jeddah contribute to make Jeddah more vulnerable to flooding. Tekeli (2017), states that the rainfall's patterns have been increasing last year due to climate change in Jeddah. In contrast, the water drains are limited which causes the floods. Jeddah's climate is followed by a subtropical region that has winter and spring. In addition, Jeddah has a unique topography in which it has deposition of soil and alluviums, high density of waterways, narrow valleys, which lead to not getting rid of rain water through channels (Almalki, 2017).

2.3 Crisis communication and jeddah floods

Communication during the crisis had different kinds. First, it takes part before the disaster happens, and different organizations are responsible for that kind of communication (Benoit, 2008). Many organizations like meteorological departments can make excellent preparation plans for floods that will result in mitigating the negative effects. Second it takes place during a crisis. This communication aims to make the public aware of the rescue team and their hard work during the crisis. Lastly it happens after the disaster which focuses on analyzing the event and contributes to preventing upcoming disasters or at least dealing with them wisely (Benoit, 2008). The communication during all stages must be factual and founded on facts rather than doing it randomly.

The negative effects of disaster depend largely on the preparation to prevent these kinds of crises. The 2009 flood in Jeddah caused many damages like death of 100 citizens, wasting of time, and interruption of the communication and transportation networks. According to Abdullah & Othman (2015), poor

management of this flood was due to many factors like absence of clear steps should be taken to face a disaster, constructing urban settlement incorrectly in which most people lived along the drainage systems as stated previously, and absence of any warning before floods occurrence and even when the notice was given, people are not prepared to face that kind of crisis. Regarding floods that happened in 2009, other reasons are presented in poor management, absence of disaster relief plan, and wrong organizational action, and corruption (Abdullah & Othman, 2015). If the Saudi authorities take these issues into consideration, the negative effects will be reduced, and to ensure that future natural catastrophes do not have the same impact on the people, action must be a priority among authorities.

Jeddah has the danger of experiencing floods and two factors increase the vulnerability. According to Ameer (2016), two reasons are responsible for making Jeddah vulnerable to floods: an absence of culture risks and the poor city construction under the guise of city development. Regarding the level of public awareness, Ameer (2016) states that it turned out that the city's residents have information gaps that rendered them vulnerable to the consequences of the floods. For instance, it was seen that the people lacked environmental awareness; they did not properly understand what constituted sensible environmental use. Also, because they were unaware of the dangers, individuals build homes near drainage systems, which increase their vulnerability to flood damage. Lastly, people in Jeddah were unaware of any potential risks in the area. All these factors made it difficult to respond to the floods, which caused more deaths and property damage.

Strategies to prevent floods

Many scholars provide brilliant solutions to prevent floods or at least control them. Almalki (2017) noted many steps that can be taken to prevent floods and its danger. First, he recommended implementing a plan to manage surface runoff in the city since most of the flash floods were created by surface runoff. Thus, an implementing plan is necessary to ensure that this water will last to the right place which helps in preventing floods. Also, by using maps, floodplains could be determined very well, and these maps should be distributed to the people. This educational information will make people aware of the danger of constructing homes in flooding areas. Moreover, the drainage system ought to be progressed to help in channeling surface runoff to the sea to avoid the water collection that results in flooding. Using big bioswales is one approach to do this. However, Almalki (2017), warns that doing so runs the risk of plant growth encroaching on the bioswales and reducing their capacity for drainage.

Research questions

RQ1: What are the public's reactions to Jeddah's flood through Facebook and Twitter?

RQ2: What is the Saudi government's reaction to Jeddah's flood through Facebook and Twitter?.

3. METHOD

This study used a Qualitative content analysis. Creswell (2013), states that the qualitative method is one of the main research approaches that begins with examining the meaning within messages or situations depending on theoretical backgrounds. Qualitative methods look for indirect implications that are not easily figured out. The created themes will be answers to the research questions. Content analysis can be utilized with either qualitative or quantitative data. According to Parveen & Showkat (2017), content analysis could be used to examine books, tweets, facebook updates and so on. In addition, content analysis method recognizes the themes in data although they are not organized (Hsieh & Shannon, 2005).

The researchers depended on content analysis to find out the results since many studies that examine social media content followed this method. Snelson (2016) states that content analysis is the suitable method to study social media platforms. Content analysis works well with a variety of social media types because the messages could be analyzed, and the themes created after that. Content analysis method will give accurate results if the procedure were right and no worries of getting biased data.

Brooke Fisher Liu and Sonja Utz studies inspired this study in choosing the data and determining the appropriate size number because they both focused on communication crisis and social media specifically, Fisher studied how people seek out information during crisis and Utz examined how people respond to the crisis in Twitter and traditional media as well.

Data collection

Like Fisher's study, this research also relied on a relatively small sample size. Specifically, 200 posts and tweets from both Facebook and Twitter were analyzed, representing both government and public responses. The data was collected using the hashtag "*#Jeddah Floods*" to ensure relevance. To mitigate bias, the first 50 tweets were analyzed from this dataset. On Facebook's search box, Jeddah floods term was used to look for the posts for both the public and the government. depending on specifying years on search box, 50 posts were analyzed for each year from 2009n and 2017. This feature was used to give more credibility to the data selection and to find outposts during all the disaster stages including recovery and post recovery.

After collecting the data, the researchers started coding the data and creating the themes. The tweets and posts were analyzed by two researchers individually according to the created themes to check the internal reliability. They repeated the work two times to receive an acceptable percentage of agreement.

The posts and tweets were examined according to many criteria like their intended use—which can be to explain a situation, relate a personal experience, offer a solution, place blame, or offer to help—the blogs and tweets were examined. The presence of attachments like links, images, or videos in the posts was another aspect to consider. The third area was the information's source, which may be a tweet, a newspaper, a website, or word-of-mouth.

In accordance with the reason for the data entry, the posts written by authorities were examined. The attachments to these data sets were examined as well in a similar manner. The solutions offered in postings were divided into two categories: short-term and long-term.

Data analysis

The information gathered from tweets and posts on Twitter and Facebook was analyzed following the research standards specified in the method section. Since the data in the form of tweets and messages is qualitative, it necessitates qualitative analysis methods. Effective qualitative analysis should be unbiased and capable of extracting meaningful information from the datasets. Coding emerges as the most suitable method for analyzing qualitative data. Throughout the research, data was meticulously analyzed using coding techniques. Although coding can be carried out through both deductive and inductive approaches, the inductive process is considered more reliable because it allows the researcher to develop a new theory guided by the data itself.

Ensuring data credibility is crucial in maintaining the overall credibility of research. Credible data must remain unaltered and unbiased. In this study, efforts were made to ensure data credibility by employing specific keywords, namely "*Jeddah*" and "*floods*," in the data collection process from Facebook and Twitter. These keywords were chosen carefully to avoid any leading or biased phrases. Moreover, the research team had no influence over the content searched, and only the top posts were selected, enhancing the reliability of the collected data. If other researchers were to replicate the study using the same methodology, they would likely collect the same data, further confirming its credibility and consistency.

Following the data collection process, the research team meticulously coded all 142 data entries. Similar sets of codes were combined to identify overarching themes within the data. Each team member independently analyzed the posts and tweets based on these themes until a satisfactory level of similarity was reached. This approach was taken to ensure internal consistency within the analysis. The most prominent themes were then identified and noted, providing a structured framework for the subsequent stages of the research.

Attachments data were also considered. They were grouped according to the themes they represented. Furthermore, the frequency of each type of attachment was calculated in relation to the total number of posts. This analysis provided valuable insights into the significance that both the public and the government attribute to specific attachments. Understanding this context is crucial as attachments serve to emphasize certain points or provide additional information, indicating their importance within the discourse surrounding the topic.

4. FINDINGS

The data extracted from tweets and posts underwent content analysis, utilizing a coding technique. Codes were employed to provide a comprehensive overview of the content within specific data sets, aiding

researchers in processing textual information effectively. Coding, typically applied prior to theme formation, allows for the organization and categorization of the data. Themes, on the other hand, are refined codes that succinctly capture the essence of a particular data set, presenting the information in a more general and readily understandable manner. They offer a condensed representation of the data, facilitating a deeper understanding of the underlying patterns and trends within the information being analyzed.

Through inductive coding, approximately 30 codes were generated to capture the essence of both data sets. These codes encompassed a range of topics such as describing the events, discussing the Jeddah floods, volunteering and donations, property damage, legal actions taken against suspects, and calls for prayers. While these codes conveyed the general message of the text, a further step was taken to develop overarching themes from these initial codes. After condensing the codes, the analysis yielded a total of five themes, each representing a distinct aspect of the textual data. These themes were categorized as follows: description, blame, volunteering, solutions, and others. Each of the themes is described below:

Description: This theme encapsulates textual content providing information about the various consequences of the floods, including loss of lives, damage to property and existing infrastructure, and the impact on essential services like healthcare and education. It also includes reports on weather patterns that might have contributed to the occurrence of the floods.

Blame: Under this theme, discussions focus on blaming authorities for their perceived failure to ensure the safety of citizens. It also encompasses accusations directed at specific individuals in positions of power, holding them accountable for flood-related issues.

Volunteering: This theme encompasses texts that describe the efforts of volunteers aiding the affected population. It includes accounts of individuals who lost their lives while attempting to rescue others from the floods, as well as people who offered monetary donations and material goods to assist those affected. Additionally, it covers expressions of support and appreciation for individuals, groups, or agencies involved in relief efforts.

Solutions: Texts under this theme outline proposed solutions to address the recurring flood problem. It also includes information about the incarceration of individuals suspected of having a direct or indirect role in exacerbating the effects of the floods.

Others: The "others" theme encompasses diverse activities that do not fit within the categories. This includes humorous references to the floods, unconventional activities like surfing and jet skiing on floodwaters, and advertisements utilizing the keywords "Jeddah floods."

Research question 1 findings

In research question one, the focus was on understanding the public's response to the Jeddah flood crisis on social media platforms, specifically Facebook and Twitter. The study examined 84 sampled (Appendix 5) Facebook posts originating from public personal accounts. The analysis revealed that the most common theme among these posts was "description," followed by "others," "solutions," "blame," and "volunteering". This trend persisted in a year-by-year data analysis, with "description" consistently being the dominant theme (Appendix 1). On Twitter, the study analyzed 58 sampled tweets (Appendix 4), all sourced from public posts. Like Facebook, the most prevalent theme among these tweets was "description," highlighting various details about the flood crisis. "Blame" emerged as the second most prevalent theme, followed by "volunteering," "others," and "solutions"(Appendix 2).

In each theme identified, specific codes recurred, representing the frequency of ideas expressed in the posts and tweets from both Facebook and Twitter. For instance, within the "description" theme, most posts and tweets revolved around describing the extent of property damage and loss of life caused by the floods. Many of these descriptive posts included photo and video attachments, providing visual information. Additionally, other offered information included the possible causes of the flood situation.

Within the "blame" theme, most posts and tweets focused on highlighting the government's failures in preventing and managing the floods. People often expressed opposition to government investments in sectors unrelated to flood prevention. Notably, there was a noticeable disparity in the frequency of posts carrying the "blame" theme between Twitter and Facebook. Specifically, out of the fifty-eight entries on

Twitter, fourteen placed blames on the government and leaders. In contrast, there were only two out of eighty-five entries on Facebook that reflected this theme.

In the "*volunteering*" theme, the analysis of posts and tweets revealed that a significant portion of the information focused on individuals helping by providing monetary donations and material goods to help those affected by the floods. Additionally, within this theme, there was a limited amount of textual data that praised volunteers for their efforts in saving people's lives. Furthermore, some posts and tweets included posthumous honors for individuals who lost their lives while volunteering during the crisis. Interestingly, there was a notable difference between Twitter and Facebook concerning offers for volunteering. Twitter showed a higher presence of posts offering volunteering services compared to Facebook.

Within the "*solutions*" theme, the analysis of posts and tweets revealed that a significant portion of the data proposed solutions that involved the arrest of individuals connected to the flood disaster. This included public officials allegedly involved in misappropriation of state funds and other activities exacerbating the effects of the floods. Notably, many posts offering information about these arrests were linked to media websites and news centers. This highlights the role of media sources in disseminating information about actions taken against those responsible for worsening the impact of the floods. The focus on legal actions and arrests as potential solutions underscores the public's demand for accountability and justice in the face of the crisis.

In the "*others*" theme, the posts contained minimal or no relevant information about the floods. Most entries in this category involved individuals using the keywords "*Jeddah floods*" to advertise their products. This practice was more common on Facebook than on Twitter. Out of the nine entries under the "*other*" theme on Facebook, five were related to product advertisements. The remaining four posts included jokes about the situation. Additionally, some posts contained videos depicting individuals engaging in activities like surfing and jet-skiing in floodwaters. These posts, while not directly related to the crisis, showcased unconventional responses and behaviors of some individuals during the flood situation.

In addition to analyzing themes, the study also considered the types of attachments used in posts. Attachments were categorized into photos, videos, and links to websites. Analyzing the frequency of each attachment type in relation to the total number of posts revealed that photos were the most frequently used attachment. Videos were the second most common attachment, while links to websites were the third most utilized attachment type (Appendix 3). This analysis provides insights into the multimedia content shared by users during the discussion of the Jeddah floods, highlighting the preference for visual elements, particularly photos and videos, in conveying information and experiences related to the crisis.

Research question 2 findings

In research question 2, the focus was on understanding how the government responded to the Jeddah flood crisis on social media platforms, specifically Facebook and Twitter. Interestingly, none of the posts collected from Facebook or tweets collected from Twitter originated from any government agency, authority, or ministry. Despite this absence, references to the government's actions were indirectly made by citizens in their tweets and posts. This indirect referencing included mentions of government activities such as prosecuting suspects and budgetary planning to address the disaster.

The absence of direct communication from the government, coupled with the limited information available about their actions, suggests a lack of proactive engagement. This situation implies that the government's approach to managing its image amid the crisis could be characterized as a form of denial strategy. This strategy involves denying responsibility and attempting to cover up the situation. The lack of direct communication from official government channels may have contributed to the perception of limited transparency and accountability during the crisis.

5. DISCUSSION

The researchers' analysis, which involved coding and theme development, provided valuable insights into the content and information conveyed through each post and tweet. These findings shed light on a unique perspective regarding the utilization of social media by both the public and the government during times of crisis. By examining the themes and content within these social media posts, the study uncovered

the ways in which individuals and government entities engaged with and responded to the Jeddah flood crisis. This research has the potential to contribute to a deeper understanding of how social media is employed as a communication tool in the context of both public discourse and government actions during critical situations.

The Four Channels model recognizes that communication is not a linear process, but a complex web of connections where information flows in various directions. It highlights the central role of the public, particularly through social media, in crisis communication (Sellnow & Seeger, 2013). In this model, the public plays a crucial role as they experience the crisis firsthand and are responsible for sharing vital information with the mass media, enabling wider dissemination to the public. Social media has significantly transformed the landscape of crisis communication, making it easier to send and receive real-time information. This advancement allows authorities to communicate simultaneously with both the mass media and the public. Technological progress has narrowed the gap between authorities and the public, facilitating seamless sharing of crisis-related information. The study's results align with this communication model, indicating that the majority of social media communication before, during, and after a disaster focuses on sharing essential information that describes the situation and warns of potential threats. This emphasizes the critical role of social media platforms in crisis communication, where rapid, widespread, and accurate dissemination of information is paramount.

Image repair theory is a framework that explores how individuals and groups utilize communication strategies to restore their reputation, especially in the aftermath of a crisis (Benoit, 1997). This theory is particularly pertinent in understanding an organization's response during and after a crisis event. Image repair tactics can vary significantly, especially in situations where a crisis recurs (Benoit & Pang, 2008). In the context of the Jeddah floods, the available data suggests a notable absence of communication from the government. This lack of communication indicates that the government's chosen image repair tactic was to deny responsibility and remain relatively hidden from public discourse.

By not engaging in direct communication and transparency about their actions, the government opted for a strategy of maintaining distance and avoiding direct responsibility, potentially to mitigate immediate backlash or scrutiny. This tactic, however, can have implications for public perception, as it might be perceived as a lack of accountability or transparency. Understanding these strategies is crucial, as they provide insights into how organizations and authorities manage their public image in times of crisis.

Previous studies in the field of crisis communication have consistently highlighted the pivotal role of social media as a platform for citizens to communicate with the government during and after a disaster. According to Elsamni (2018), social media provides a channel through which citizens can effectively reach out to the government. Specifically, in the case of the Jeddah floods Elsamni (2018) observes that Facebook users utilized the platform to articulate their demands to the government. These demands included initiating a thorough investigation into the disaster and prosecuting officials who were allegedly involved. The findings from this study align with Elsamni (2018) argument. The analysis of posts under the theme "*solutions*" revealed that a significant portion of these posts contained demands from citizens to the government. These demands were primarily focused on the arrest and prosecution of officials implicated in the disaster. This alignment underscores the significant role of social media in enabling citizens to voice their concerns, demands, and expectations directly to the government, thereby shaping the discourse around crisis management and accountability.

Future studies can explore public interactions through various social media platforms is valuable. Examining multiple social media networks can provide a comprehensive and nuanced understanding of public responses to crises. By incorporating a diverse range of social media platforms into future studies, researchers can gain a more holistic view of public reactions, enabling a comprehensive analysis of the societal responses to disasters in the digital age.

6. CONCLUSION

Effective communication is vital in crisis management, requiring open dialogue between authorities and citizens. The emergence of social media has significantly altered how crises are communicated, offering opportunities for enhanced interaction between the government and the public. Despite this transformation,

limited research has explored how the public and government engage on social media during crises. This study addresses this gap by demonstrating how social media presence influences communication dynamics between the government and citizens. It illustrates the active role citizens play in disseminating crucial information about crisis developments, impacts, potential solutions, and disaster mitigation techniques. Understanding these dynamics is essential for crafting effective crisis communication strategies in the digital age. Your study's insights contribute significantly to the evolving field of crisis management, illuminating the complex ways social media shapes public and governmental responses during crises.

APPENDICES

Appendix 1

Yearly frequency distribution table of themes in facebook posts

Year	Theme Frequency				
	Description	Blame	Volunteering	Solutions	Others
2009	9	0	0	0	0
2010	8	1	0	0	0
2011	10	0	0	0	0
2012	4	2	0	4	0
2013	8	1	0	0	0
2014	8	0	1	1	0
2015	3	0	0	0	1
2016	8	0	0	0	5
2017	7	0	0	1	2
2018	6	0	1	1	2

Appendix 2

Frequency distribution of themes in tweets from twitter

Theme	Frequency
Description	24
Blame	14
Volunteering	6
Solutions	5
Others	6


Appendix 3


Frequency distribution table of attachments from facebook posts

Attachment	Frequency
Photos	27
Videos	21
Links	13
No attachment	23

← #jeddahfloods 🔍 ☰

Top Latest People Photos Videos


 Danielle @daniellelt178 · 17 Nov 15
What people do in Jeddah during a flood.
[#Jeddahgheir](#) [#JeddahFloods](#)


0:14



1,437 views


💬 2 ↻ 11 ❤️ 5 🔗

Thanks. Twitter will use this to make your timeline better. Undo

 Juan M. Sacristán @JuanMSac... · 29 Jan 11
Ten dead, three missing in [#Jeddahfloods](#) –
<http://ht.ly/3MoVg>

💬 ↻ 2 ❤️ 🔗

  @bruisedhope_ · 31 Dec 10
RT @almizyenalaa Another one of Al Amar



**APPENDIX 4
TWEETS COLLECTED FROM TWITTER**

← Q jeddah floods ×

1 POSTS YOU'VE SEEN 2009 POSTS FROM TAGGED LOCAT

 الحملة الشعبية للمساهمة في إنقاذ مدينة جدة
Group • 1.1K members

 Abdulrahman Al Sabban

5 Dec 2009 • 🌐 • a video that shows how jeddah's youth respond to the flood that occurred a week ago .. فيديو بسيط يعرض مدى تفاعل شباب جدة و مبادرتهم بالمساعدة عقب حدوث سيل الأربعاء ملاحظة : كل الصور مأخوذة من الفيس بوك شكراً لكل من ساهم و ...

YOUTUBE.COM
Jeddah's flood in our eyes سيل جدة في عيون شبابها



8 25 comments

 كلاش وبس
Group • 13 members

 Koketo Samarkandi (Moh)

15 Dec 2009 • 🌐 • Jeddah Flood - youtube.com

YOUTUBE.COM
Jeddah's Flood (Song By Klash كلاش)



1 1 Comment

 Ravika De Silva

6 Dec 2009 • 🌐 • Jeddah 2009 • Jeddah Flood



APPENDIX 5
POSTS COLLECTED FROM FACEBOOK

REFERENCES

1. Abdullah, N.N., & Othman, M. (2009). Disaster Management: Empirical Study of 2009 Jeddah Flood. *Abdullah, NN & Othman, M.(2015). Disaster Management: Empirical Study of*, 1083-1087.
2. Almalki, A A. (2017). *Flood Mitigation in Jeddah, Saudi Arabia* (Doctoral dissertation, Ohio University).
3. Ameer, F. (2016). Floods in Jeddah, Saudi Arabia: unusual phenomenon and huge losses. What prognoses. In *E3S web of conferences* (Vol. 7). EDP Sciences.
4. Benoit, W L. (1997). Image repair discourse and crisis communication. *Public relations review*, 23(2), 177-186.
5. Benoit, W.L., & Pang, A. (2008). Crisis communication and image repair discourse.
6. Cariappa, S. (2016). The role of social media in crisis communication. *DigitalVidya*.
7. Davies, R. (2013). Jeddah flood defences. *Floodlist*.
8. Elsamni, A. (2018). Social media applications in crisis management of natural disasters: Lessons for the Arab region. *Arab Media & Society*, 25, 1-10.
9. Austin, L., Fisher Liu, B., & Jin, Y. (2012). How audiences seek out crisis information: Exploring the social-mediated crisis communication model. *Journal of applied communication research*, 40(2), 188-207.
10. Graff, R., Walzer, A. E., & Atwill, J. (Eds.). (2005). *The viability of the rhetorical tradition*. SUNY Press.
11. Holtzhausen, D.R., & Roberts, G.F. (2009). An investigation into the role of image repair theory in strategic conflict management. *Journal of Public Relations Research*, 21(2), 165-186.
12. Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288.
13. Jeddah Facts and Figures: Jeddah Annual Report 2016-2017. (2017). Jeddah Chamber.
14. Miles, H. (2010). *Al Jazeera: How Arab TV news challenged the world*. Hachette UK.
15. Lama. (2019). *Social media statistics in Saudi Arabia*.
16. Parveen, H., & Showkat, N. (2017). Content analysis. e-PG Pathshala. *Aligarh, India*.
17. Pradhan, B. et al. (2016). Analysis on causes of flashflood in Jeddah City if 2009 and 2011 using multi-sensor remote sensing data and GIS. *Geomatics, Natural Hazards & Risk*, 7(3), 1018-1042.
18. Sellnow, T.L., & Seeger, M. W. (2021). *Theorizing crisis communication*. John Wiley & Sons.
19. Snelson, C.L. (2016). Qualitative and mixed methods social media research: A review of the literature. *International Journal of Qualitative Methods*, 15(1), 1609406915624574.
20. Snelson, C.L. (2016). Qualitative and mixed methods social media research: A review of the literature. *International Journal of Qualitative Methods*, 15(1), 1609406915624574.
21. Talkwalker.com. (n.d) <https://www.talkwalker.com/blog/social-media-statistics-saudi-arabia>
22. Tekeli, A.E. (2017). Exploring Jeddah floods by tropical rainfall measuring mission analysis. *Water*, 9(8), 612.
23. Schultz, F., Utz, S., & Göritz, A. (2011). Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public relations review*, 37(1), 20-27.
24. Youssef, A.M., Sefry, S.A., Pradhan, B., & Alfadail, E.A. (2016). Analysis on causes of flash flood in Jeddah city (Kingdom of Saudi Arabia) of 2009 and 2011 using multi-sensor remote sensing data and GIS. *Geomatics, Natural Hazards and Risk*, 7(3), 1018-1042.