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[ijbs] Submission Acknowledgement

3 messages

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To: Lady Joanne Tjahyana <joanne@petra.ac.id>

27 August 2022 at 09:21

Lady Joanne Tjahyana:

Thank you for submitting the manuscript, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community" to Petra International Journal of Business Studies. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

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If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Dr. Ir. Hotlan Siagian, M.Sc.

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Joanne Tjahyana <joanne@petra.ac.id>
To: "Dr. Ir. Hotlan Siagian, M.Sc." <ijbs@petra.ac.id>

31 August 2022 at 09:37

Dear Dr. Ir. Hotlan Siagian, M.Sc.

Noted with thanks.

Best regards,

Joanne Tjahyana
--

Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community

Abstract

Cryptocurrency is a speculative investment due to its volatility that could result in large returns but also could end in crashes. Terra blockchain collapsed when its stablecoin UST failed to maintain its peg to 1 USD and caused its sister coin LUNA to drop for more than 90% only in few days. Terra LUNA itself has gained its success and attracted many investors that became a strong community called Lunatics. Using Netnography, this study tried to observe crisis response strategies from Do Kwon as founder and CEO of Terraform Labs and from Terra LUNA official Twitter account during the crash. Also, this study used community sentiment as an indicator to measure the success of the strategies. Moreover, this study observed the interaction within the community during the crash and how they survived to overcome the crisis together. The results show that the mortification and corrective action are the most effective strategy to generate positive sentiment. However, denials toward rumors cause more negative sentiment within community. Despite the recovery plan from Terra network, Lunatics community also has its own ways to recover from the crisis. This study also revealed that community influencers roles are crucial in controlling rumors during the crisis.

Keywords: crisis; crisis response strategies; cryptocurrency; community; crash; sentiment

1. Introduction

Cryptocurrency as digital currency gained more popularity because of its decentralized system running on blockchain technology that considered more secure and transparent as an alternative form of digital payment and investment (Koroma et al., 2022). As a speculative investment, cryptocurrency high volatility could result in large returns but also could end in price bubbles (Grobys & Junttila, 2021). Price bubbles in cryptocurrency are conditions where the price slowly rises at the beginning and then increasing faster because of the excitement of the market and the rising demand (Phillips & Gorse, 2017). However, when the investors satisfied with their profit and start to reduce positions, the price decreases faster as the market enter the panic selling phase (Phillips & Gorse, 2017). Cryptocurrency market conditions can change very fast due to volatility, and price bubbles could be followed by market crash and other extreme conditions (Sebastião & Godinho, 2021). Cryptocurrency crash happened several times such as on March 11, 2020 when the World Health Organization (WHO) stated Covid-19 outbreak as worldwide pandemic (Umar, Jareño, & González, 2021). After the pandemic declaration, cryptocurrency market lost almost half of its capitalization value on March 13, 2020 and fully recovered at the end of May 2020 (Umar et al., 2021).

Another dramatic crash happened on May 2022, when Terra blockchain with its main coins Terra UST and Terra LUNA collapsed (Kim et al., 2022). Terra blockchain itself has achieved success with the price of LUNA that increased from only less than 1 USD to more than 90 USD by the end of December 2021 (Yaffe-Bellany & Griffith, 2022). Terraform Labs that based on South Korea was founded by Daniel Shin and Do Kwon on January 2018 and has attracted attention of many investors worldwide ("Terra Price Today, LUNA to USD Live, Marketcap and Chart," 2022). Kim et al. (2022) reported that Terra crash started when the stablecoin algorithm failed to keep UST price pegged to 1 USD. They described that the algorithm was used to maintain the peg with swap and mint system between UST and LUNA. Kim et al. (2022) stated that when UST price is less than 1 USD, investors could burn 1 UST and swap it

to 1 LUNA. Thus, this swap will decrease UST in circulation and make the price higher, and at the same time it will mint and add LUNA in circulation (Kim et al., 2022). On the other hand, when UST price is more than 1 USD, investors could burn 1 LUNA and mint 1 UST to gain profit and at the same time decreasing UST price to 1 USD (Kim et al., 2022). Unfortunately, the stablecoin algorithm failed to maintain the peg when over 2 billion USD worth of UST was drawn from Anchor Protocol on May 7, 2022 that immediately triggered other selling of other millions of UST (Boom, 2022). Traders tried to make profit from this situation by swapping UST to LUNA that in result added more LUNA in circulation and make its price collapsed (Shen, 2022). LUNA price drastically dropped from almost 120 USD in April 2022 to 0,01 USD in May 13, 2022 (Boom, 2022).

However, despite the devastating event that frustrated many investors, Terra LUNA has strong support from its community (Melinek, 2022). The community member called themselves Lunatics, and they still showing their loyal support during and after the crash (Melinek, 2022). Moreover, as mentioned in Terra official website, the community use hashtag #LUNAtics to identify the posts and discussions on social media, particularly on Discord, Twitter, Telegram, Reddit, and other media such as blog on Medium ("Terra Money - Community," n.d.). Do Kwon also proud of Terra community as his loyal supporters and often mentioned Lunatics on all his tweets and interviews (Yaffe-Bellany & Griffith, 2022). When the crash happened, Do Kwon reached to the community and investors and communicated all his recovery plans directly through his personal Twitter account (Genç, 2022).

There are previous studies on virtual community, such as a research on a Facebook leisured - based virtual community by Lizzo and Liechty (2020). Using netnography method, they discovered that the virtual community sense of belonging was experienced through sharing both negative and positive experienced and by supporting each other during several virtual racing events or other specific occasions (Lizzo & Liechty, 2020). Another netnography study was conducted by Tjahyana (2021) on Dogecoin cryptocurrency community on Twitter. The study found that Dogecoin cryptocurrency community support each other by replying and reacting to the tweets (Tjahyana, 2021). Also, the role of influencers and public figures were important to maintain community positive sentiment towards Dogecoin, so they keep holding their investment even though the price decreased (Tjahyana, 2021). Furthermore, Ballinari & Behrendt (2021) stated that it is very important to keep social media sentiment positive towards an investment, as it could make the investors feel optimistic and tend to hold their investment. Therefore, as described by Agarwal, Aziz, & Zhuang (2022), it is crucial to give the right clarification and verified information on social media to reduce uncertainties and doubt because of the crisis, especially when a lot of rumors already spread.

The purpose of this study was to find how the Lunatics community handle the crisis that happened because of the crash, and at the same time maintaining their identity as loyal supporters of Terra LUNA. Netnography was used as the method to participate and discover the communication pattern and interaction during the crash. Moreover, this study tried to observe crisis response strategies that Do Kwon, Terraform Labs and other Terra LUNA influencers were trying to implement during the crash. Also, this study monitored and analyzed community sentiment as a success indicator of the crisis communication strategy. This study focused on interactions and conversation on social media Twitter as one of the main public channels for Lunatics community.

2. Literature review

Crisis Response Strategies

When crisis happened, the right crisis communication strategy is needed, such as implementing crisis response strategies in order to reduce the consequences and decrease the reputational risks of an organization (Triantafillidou & Yannas, 2020). Benoit (as cited in Triantafillidou & Yannas, 2020) discovered five ways of crisis response strategy in order to restore reputational image. The first one is denial, that can be divided into two types which are (i) simple denial that is when the organization directly denies the incident that happened, and the next type is (ii) shifting the blame, which happened when the organization specifies other parties were responsible for the crisis (Triantafillidou & Yannas, 2020). The next crisis response strategy is responsibility evasion, when the organization includes other factors to be the cause of the incident that were uncontrollable and were not meant to be happened (Triantafillidou & Yannas, 2020). Furthermore, the next way as crisis response strategy is to reduce the offensiveness, which involves exposing the positive actions and achievements in the past and also minimize the crisis negative effect by giving compensation to the ones that affected (Ferguson, Wallace, & Chandler, 2018). Moreover, mortification is also included in one of the crisis strategy response, as the organization admit the incident, and accept to be responsible for the crisis (Ferguson et al., 2018). Next, corrective action as crisis response strategy is used as the organization try to recover the situation and conduct preventive action to avoid reoccurrence of the incident (Ferguson et al., 2018). According to Triantafillidou & Yannas (2020), corrective action is the most effective way as crisis response strategy through social media. They stated that posts and messages that convey corrective actions generated more positive engagement through likes, comments, and shares (Triantafillidou & Yannas, 2020).

Rumor Clarification and Community Sentiment

During crisis events, rumour often propagated among social media users and clarification is needed to help users determine the next acts to be made in response to the crisis (Agarwal et al., 2022). Rumour itself has certain characteristics, which includes type of information that could be true or false and has not been clarified by trusted sources (Zhao, Resnick, & Mei as cited in Agarwal et al., 2022). Moreover, during a crisis several different rumors could be spread on social media, therefore organization has to choose the right rumor to be clarified and publish the clarification on the right time through social media, so it can eliminate uncertainties among social media users (Agarwal et al., 2022).

Several studies have tried to find connection between social media sentiment and cryptocurrency price movement. By using Latent Dirichlet designation (LDA) data processing model, a study from Poongodi M., Nguyen, Hamdi, & Cengiz (2021) on social media data related to Bitcoin discussions has found that sentiment on social media could be used to predict global cryptocurrency price. Another study conducted by Valencia, Gómez-Espinosa, & Valdés-Aguirre (2019) has concluded that machine learning and sentiment analysis on social media data could be used to predict cryptocurrency price movement especially for Bitcoin, Ethereum, Ripple and Litecoin. Furthermore, a study from Hassan, Hudaefi, & Caraka (2021) using automated web scrapping and machine learning has discovered that sentiment on Twitter reflected cryptocurrency market conditions. For instance, the positive sentiments found on the study might describe the value increase in the investment, and anticipation emotions described market responses to extreme conditions such as price bubbles (Hassan et al., 2021). Also, the

study discovered several top words such as "bullish", "luck", "awesome" for positive sentiment and "scam", "loss", "explode" for negative sentiment (Hassan et al., 2021). Another study on social media sentiment analysis, conducted by Ortu, Vacca, Destefanis, & Conversano (2022) found and categorized cryptocurrency related top words based on discussion topics, such as "money", "time", "wallet" for personal investment topic, and "power", "believe", "address" for Bitcoin & blockchain topic, and "pay", "fee", "rate" for trading topic.

Virtual Community

Furthermore, there are several studies that focused on virtual community. McMillan & Chavis (as cited in Lizzo & Liechty, 2020) identified four factors for developing sense of community, which are : membership, influence, integration, and fulfillment of needs. They found that membership in virtual community includes unique symbols and terms that they use to communicate and identify themselves as part of the community and it brings the members closer to each other (Lizzo & Liechty, 2020). The next factor of developing sense of community is influence, which through participating in the community, members feel the joy and satisfaction when they can bring impact not just for the community but also for larger targets and societies (Lizzo & Liechty, 2020). Moreover, Lizzo & Liechty (2020) also stated that integration and fulfillment of needs as the next factor for developing sense of community could be seen when members share the same passion and excitement within the community. The members can support each other by sharing and celebrating personal achievement or even by giving encouragement and motivation for members that need emotional support (Lizzo & Liechty, 2020). A study on a Twitter based cryptocurrency community conducted by Tjahyana (2021), found that there are five communication patterns that occurred in the community. The first pattern is self identification when interact in the community by using unique hashtags or cashtags that related to specific cryptocurrency and the second pattern is to interact with each other by giving likes and replies in discussions (Tjahyana, 2021). The next pattern is to give motivation and encouragement to each other especially when the price decrease or when some members got trading loss (Tjahyana, 2021). Furthermore, Tjahyana (2021) also discovered the fourth pattern that involves influencers and public figures in the cryptocurrency community, by giving likes, replies, and reshares. Also, the community members often mention the influencers and public figures accounts when questioning about cryptocurrency price movement, hoping that they will get confirmation about the future of their investment (Tjahyana, 2021). Finally, the last pattern also involves influencers and public figures when they give encouragement, motivation, and supports to the community to keep holding their cryptocurrency investment (Tjahyana, 2021).

3. Methods

This study used Netnography as qualitative method to observe and investigate communication and interaction within Lunatics community, especially during crisis that happened because of Terra LUNA crash in May 2022. Netnography is a method to observe, understand and interpret communication and interaction within virtual communities on the internet (Ahuja & Shakeel, 2017). Netnography is divided into several steps which are (i) defining the research context and objective, (ii) participating in the virtual community, (iii) collecting and analyzing data, (iv) making sure about ethical and privacy standard, and (v) interpreting and representing data (Kozinets, 2018). According to Kozinets (2018), netnographers have flexibilities on becoming active participants or just passive observants in the community. He also stated that netnography will save more time and energy because data

collection and analysis from online community could be done more effectively with various statistical data processing tools (Kozinets, 2018). However, Kozinet (2018) also stated that because of the nature of internet data that could be accessed by anyone, netnographers should pay attention to data privacy and ethical standard within the communities. Next, cultural representation could be done by understanding value and meaning behind language, rules, identities, symbols, roles, stories, myths, rituals and other cultural elements (Kozinets, 2018).

This study used netnography with these following steps :

- i. Netnographer (researcher for netnography) already joined several cryptocurrency communities on Twitter, Telegram and other social media as a passive participant for more than 6 months.
- ii. Netnographer tried to observe and understand the communication and interactions especially within Lunatics communities and took notes some cultural insights.
- iii. Data collection was conducted using Brand24 as media monitoring software to collect and analyze conversation data related with Lunatics communities, especially the ones related with Terra LUNA crash.
- iv. Sentiment analysis also done using Brand24 and netnographer categorized data based on sentiment and cultural insight found in the community.
- v. Netnographer make communication patterns that focused on crisis communication strategy and qualitatively measured its success based on conversation sentiment.

4. Results

This research used Brand24 as monitoring tools to collect and analyze data from media social and media mainstream. To get data related with Terra LUNA crash, this study used "#Luna" as the main keyword. In result, all mentions data containing the keyword were collected and analyzed. In addition, other filter keywords also used to get more specific data, such as "crash", "cryptocurrency", "Do Kwon", "UST", "Bitcoin", and other related keywords. Data collection was conducted between 5 May until 30 June 2022 to cover several important events during the crash. All mentions data that had been collected were also analyzed and categorized into three types of sentiment, which are positive, neutral, and negative sentiment. During the selected time frame, there were total 157.364 mentions collected, with 19.192 positive mentions and 23.525 negative mentions. Moreover, there were several different days that have more data mentions than the rest of the days within the timeframe. As shown on Table 1, those days also have significant number of negative or positive mentions compare with other days.

Table 1. Positive and Negative Sentiment Data

No.	Date	Positive mentions	Negative mentions
1	11 May 2022	626	1.207
2	16 May 2022	671	525
3	22 May 2022	1.076	469
4	28 May 2022	363	537
5	13 June 2022	511	1.235
6	15 June 2022	424	963
7	18 June 2022	585	972
8	22 June 2022	441	618
9	26 June 2022	613	396

Source : Brand24

The data collection also used filter keyword "Lunatics" that specifically related with Lunatics community, and as the result it has 7.321 mentions with 1.079 negative mentions and 1.291

positive mentions. Especially on 22 May 2022 there was significant increase in positive mentions with keyword "Lunatics" as we can see the spiking positive mentions in the chart, as shown in Figure 2. The general sentiment data chart could also be seen in Figure 1.

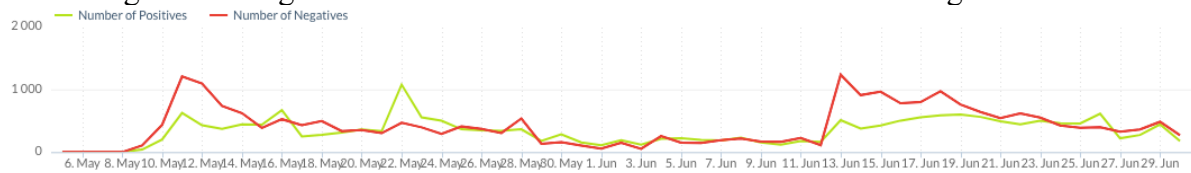


Figure 1. General sentiment chart for keyword "Luna"

Source : Brand24

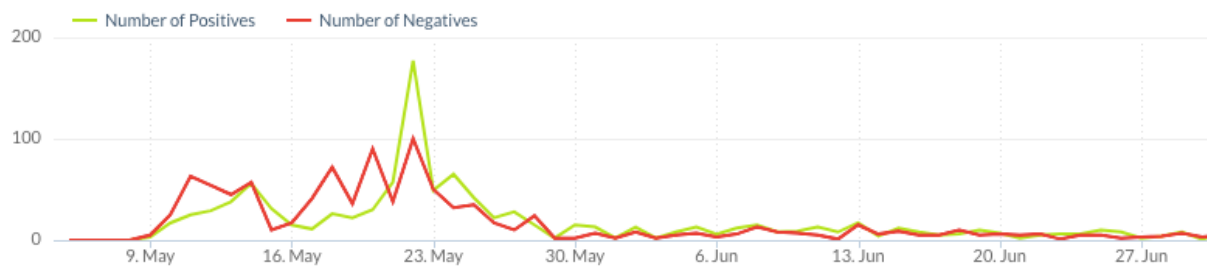


Figure 2. Community sentiment chart for keyword "Lunatics"

Source : Brand24

This netnography research also observed conversations and messages related with the crash, specifically the ones that related to crisis response strategy from Do Kwon Twitter personal account (@stablekwon) and Terra LUNA official Twitter account (@terra_money). This study tried to find the strategy around the dates that have more sentiment than the other dates.

On 11 May 2022 when Terra UST already lost its 1 USD peg for the second time and pushed down as low as 35 cents (Genç, 2022), Do Kwon tweeted through a thread on his personal account as he tried to clarify the situation and informed the community about the recovery plan. These were several words from his tweet:

"1/ Dear Terra Community:

2/ I understand the last 72 hours have been extremely tough on all of you - know that I am resolved to work with every one of you to weather this crisis, and we will build our way out of this.

Together"

(Do Kwon 🟡 [@stablekwon], 2022a)

The official account of Terra LUNA also did the same by giving statements and clarification about the crash. Here are some tweets from the thread:

"1/ Liquidity brawl behind the scenes amid material \$UST peg deviation on third-party venues.

Fighting back. More updates are incoming #LUNAtics. Hang on, fam.

Here are some resources to combat misinformation:

2/ UST MCAP > LUNA -- No death spiral happens."

(Terra 🌐 Powered by LUNA 🟡 [@terra_money], 2022a)

There was another thread from Do Kwon on 16 May 2022 when he addressed the community to show how heartbroken he was and to inform them the recovery efforts he had done up until that time.

"I've spent the last few days on the phone calling Terra community members – builders, community members, employees, friends and family, that have been devastated by UST depegging.

I am heartbroken about the pain my invention has brought on all of you."

(Do Kwon 🟡 [@stablekwon], 2022b)

Furthermore, there was a tweet from Terra LUNA official account on 15 May 2022, that tried to warn the community about several fake accounts and to strongly urge the community not to believe the messages from those accounts.

"All updates will be posted on this Twitter account (@terra_money). Any other Twitter accounts purporting to represent Terra are fake.

Users are advised to be on the lookout for scams."

(Terra 🌐 Powered by LUNA 🟡 [@terra_money], 2022b)

This warning also published at the same time when a lot of rumors about Terra LUNA fork and burn that considered the right ways for recovery.

On 22 May 2022 there was a significant increase in the number of positive mentions, even more than twice as much as the negative mentions. On that day, Do Kwon did not post any tweets. However, one day before on 21 May 2022 he did interact with the community by replying tweets related to the crash. All the questions that addressed to him were mostly about the recovery plan and about Do Kwon's commitment to resolve the problem. This study listed some of Do Kwon tweets when he actively participate in the discussion in response to the community doubts, such as :

*"My priority is not about what happens to me, but making sure the Terra community has a place to build and years of their work does not go to waste
I dont care what happens to me as long as that happens"*

(Do Kwon 🟡 [@stablekwon], 2022c)

Furthermore, several days before on 19 May 2022 Terra LUNA official account also retweeted Do Kwon's announcement to remind the community to vote on the proposal regarding several recovery plans. The proposal was about the fork plan including changing the name of LUNA to LUNA Classic or LUNC and the rebirth of new Terra blockchain.

Time to vote #LUNatics 🗳️ #TerraIsMoreThanUST

Quote Tweet Do Kwon 🟡 @stablekwon May 18

I/ Terra governance prop #1623 to rename the existing network Terra Classic, LUNA Classic (\$LUNC), and rebirth a new Terra blockchain & LUNA (\$LUNA) is now live.

Vote here: <https://station.terra.money/proposal/1623>

(Terra 🌐 Powered by LUNA 🟡 [@terra_money], 2022c)

However, there were debates among the members of Lunatics community because they were still doubting that the network separation plan or commonly referred as network fork was the best solution and they believed that burning plan will be the right solution to recover the value of LUNA (Irwan & Julianto, 2022). The increase on positive mentions on 22 May 2022 mostly consisted of the keyword "Lunatics" as seen on Figure 2 as the community encourage each other to keep on burning LUNA. The example of community tweet that listed on Brand24 as

one of popular tweets with keyword Lunatics is a tweet from Michel MB [@MichelMB19] (2022).

*We are #LUNAtics We will burn the shit out of #LUNA .
We are the community!!! We need whales with us.
#RETWEEET #lunaburn*

(Michel MB [@MichelMB19], 2022)

Terra 2.0 was launched on 28 May 2022 as part of the recovery plan. The launching was officially announced a day before on 27 May 2022 on Terra LUNA official account. Several days before the launch, Do Kwon also gave information about all the exchanges that supported Terra 2.0 and the new LUNA airdrops to existing LUNA holders. The old LUNA code changed into LUNC for LUNA Classic. However, the data not showing significant increase in the amount of mentions on that day. In fact, even though airdrops of the new LUNA were given to the existing LUNA holders, there were more negative than positive mentions on the launched of Terra 2.0.

"I/ Yesterday, we said Terra 2.0 is coming. Tomorrow, it arrives.

*The community has been working around the clock to coordinate the new chain's launch.
Subject to potential change, we expect Terra to go live on May 28th, 2022 at around 06:00
AM UTC."*

(Terra  Powered by LUNA  [@terra_money], 2022d)

On 13 June 2022 there were significant increase in the number of mentions, especially for negative sentiments. This was happened because there were negative rumors spread about Do Kwon gained a lot of fortune by cashing out \$28 billion worth of LUNA before the crash (Bertillo, 2022). Also, there were other rumors that already started to spread on 21 May 2022 stated that Do Kwon used an unknown 20 Million LUNA wallet to vote on the fork proposal, (Karunanidhi, 2022). On 12 June 2022 Do Kwon published a thread on his personal Twitter account to give clarification regarding the rumors.

*"I/ This should be obvious, but the claim that I cashed out \$2.7B from anything is
categorically false"*

(Do Kwon  [@stablekwon], 2022e)

Moreover, on 21 May 2022 Do Kwon already gave statement regarding the voting rumors, on his discussion with a community influencer @FatManTerra (Karunanidhi, 2022).

*Replying to
@FatManTerra @husseinAji
and 3 others*

Token purchase agreement holder with TFL. Besides that I decline to respond.

(Do Kwon  [@stablekwon], 2022d)

Several days after Do Kwon's clarification, there were still more negative mentions compare with positive mentions, especially on 15 June, 18 June, 22 June 2022. At the same time, Celcius Network, a leading cryptocurrency investment company suddenly stop all withdrawals, transfers and swaps because of extreme cryptocurrency market conditions (Genç, 2022). Also, in its bankruptcy document, Celcius Network mentioned the domino effect of Luna crash as

one of its liquidation causes (Genç, 2022). Most of popular negative mentions listed in Brand24 data were talking about Celcius Network and also the fall of Terra LUNA as part of cryptocurrency crash in general the during those days, Do Kwon did not specifically mention about all the rumors and about the connection between Celcius Network collapse and Terra LUNA crash, but mostly he tweeted encouragement for the community to boost their confidence in cryptocurrency.

Furthermore, on 26 June 2022 there were more positive mentions than negative mentions and during that time there were no tweets from Do Kwon and Terra official account only gave update about project updates. The positive mentions from Lunatics still revolved around the burning of LUNA Classic (LUNC), especially there were many LUNC influencers who became actively supported the recovery of LUNC such as @LunaticsToken, @LUNCDAO, @LunaClassicHQ, and @LUNC__Burn.

This study also collected and categorized Lunatics community mentions with Brand24 and listed several popular mentions based on the sentiment and the amount of likes and shares. Moreover, we also observed and collected data from Twitter. To make sure about ethical standard of this netnography research, this report shows summary of the tweets contents but does not write down the usernames of the Twitter accounts. These are several interaction patterns among Lunatics that occurred during the crash:

- i. Using hashtag #LUNAtics as identification.
- ii. Using hashtag #LUNC, #LUNCburn, #LUNAburn, #LUNAClassic for those who still believe in the recovery of LUNA classic (LUNC) and encourage each other to burn their LUNC to increase the value of it.
- iii. Creating micro influencers accounts to give updates about the latest price movements, news, and to keep reminding Lunatics community about the burning strategy.
- iv. Using greetings or phrases for casual tweets such as "dear fellow Lunatics", "good morning", "what a great day", "good night", and "stay safe #LUNC army".
- v. Showing empathy for those who suffered a lot of loss during the crash.
- vi. Giving encouragement, with words and phrases such as "holding strong", "stay strong", "together", "big news is coming", "pumping", "bullish", "rise from the grave", "going crazy", "accumulating", "Luna \$1", "moon", "survive", "explode" and "rocket".
- vii. Organizing event to facilitate NFTs, airdrops and giveaways, especially for those who suffered a lot of loss.
- viii. Mentioning or replying Do Kwon (@stablekwon), Terra official account (@terra_money) and other public figures such as Changpeng Zhao (@cz_binance) and Elon Musk (@elonmusk) when the community questioning, reporting or confirming issues regarding the crash.

Several influencers and public figures in cryptocurrency community also gave their opinion regarding the crash and the recovery plan, such as Changpeng Zhao (@cz_binance) who also the founder and CEO of Binance. He tweeted his opinion while replying some questions addressed to him regarding the fork recovery plan from Terra LUNA.

"Reducing supply should be done via burn, not fork at an old date, and abandon everyone who tried to rescue the coin.

I don't own any LUNA or UST either. Just commenting."

(CZ ♦ Binance [@cz_binance], 2022)

Another influencer in crypto space, Watcher.Guru (@WatcherGuru) also actively participate to give information regarding the crash and the recovery plan.

"BREAKING: \$LUNA is up +100% in the past 24 hours."

(Watcher.Guru [@WatcherGuru], 2022)

5. Discussion

This study gathered several mentions, categorized, and analyzed it based on the dates, sentiments, crisis response strategy and community interactions patterns. Collected Twitter mentions from Do Kwon as the co-founder and CEO of Terraform Labs and official Twitter account of Terra LUNA can be categorized into several crisis response strategies in accordance with the social media crisis communication strategies discussed by Triantafillidou & Yannas (2020). Also, some of the mentions contained rumor clarification, as stated by Agarwal et al. (2022) that publishing rumor clarification on social media is also one of important strategies during the crisis.

Crisis Response Strategies

At the early stage of the crisis on 11 May 2022, Do Kwon tweeted a thread on his personal account @stablekwon to inform community about the current crash situation (Do Kwon 🟡 [@stablekwon], 2022a). This thread consists of several different crisis response strategies. The first was mortification, as he admitted the problems that caused the crash and the next was corrective action as he informed the current situation and recovery plan for Terra UST. In addition, the strategy of reducing the offensiveness also been used by exposing positive achievements in the past such as reminding the community about the success of Terra ecosystem and how it has survived the previous setback a year before the crash. However, those strategies cannot neutralize the negative sentiment, as there were more negative than positive mentions as shown on Table 1 and Figure 1.

The next strategy was mortification as on his personal Twitter account in a thread on 14 May 2022 Do Kwon showed how heartbroken he was about the crash and how it caused a lot of pain to the community (Do Kwon 🟡 [@stablekwon], 2022b). He did not deny that Terra framework as his invention has made a lot of people suffer. Furthermore, the thread also can be categorized as corrective action strategy as Do Kwon also informed the community about the recovery plan and even stated that the Terra UST has failed and will not be part of the next recovery plan. Terra LUNA official account also post clarification on 15 May 2022 about rumors that could be spread on social media during the crisis, by reminding the community that all official updates only posted on @terra_money and others were only fake accounts (Terra 🌐 Powered by LUNA 🟡 [@terra_money], 2022b). The next day, on 16 May 2022 there were an increase in the number of positive mentions and a decrease in the number of negative mentions as shown in Table 1 and Figure 1. In contrast with what Triantafillidou & Yannas (2020) found in their studies on crisis response strategies, corrective action strategy itself was not proved to be the most effective strategy in generating more positive engagements in the community. This study found that mortification combined with corrective action could result in more positive mentions in the community, as stated by Oltra González, Camarero, & San José Cabezudo (2021) that it is important to show empathy and to show that the company understand the emotions of the community that affected by the crisis, so they will feel optimistic towards the company.

There were significant number of positive mentions on 22 May 2022 as shown on Table 1, Figure 1, and Figure 2. On that day, Do Kwon did reply to a lot of tweets from the community

that addressed to him. The replies were consisted of several crisis response strategies, including mortification, corrective actions, and rumor clarifications. In addition, several days before on 19 May 2022 Terra LUNA official account also retweeted Do Kwon's announcement about proposal voting regarding several recovery plans that could be categorized as corrective action strategy. However, the analyzed mentions data showed that the positive mentions came from the Lunatics community contained messages that indicating disapproval of the proposal. Most of the Lunatics were encouraging each other to keep on burning LUNA as they believed it was the right solution for recovery. Therefore, the mentions from Lunatics community were showing positive sentiment for LUNA as a cryptocurrency as they believe that the whole community can work together to recover its value. These findings were in line with previous studies by Xie, Pinto, & Zhong (2022) about community resilience during crisis events. They stated that social media engagement by interacting and supporting each other were very important to strengthen community resilience during crisis, so they can survive and overcome the crisis together (Xie et al., 2022).

Moreover, as can be seen on Table 1 and Figure 2, the mentions data collected with "Lunatics" as the filter keyword show a spiking rise of positive mentions more than double the number of negative mentions. Unfortunately, the positive sentiment did not show their confident in Do Kwon's recovery plan which was the network forking. This data indicates that the community has significant influence to move market sentiment, regardless the crisis responses strategies that have been done by the responsible party.

The new LUNA as the result of Terra blockchain forking has been launch on 28 May 2022 and the announcement already published several days before as part of corrective action strategy. Besides the rebirth of LUNA, existing old LUNA holders also got new LUNA airdrops as part of the compensation, and this could be categorized as reduce offensiveness strategy. However, these strategies could not neutralize the sentiment, and based on the data shown on Table 1, there were more negative mentions than positive mentions in the community at the same day with the launching of new LUNA. Based on the netnographer observation and data analysis with Brand24, there were several top negative mentions on this day indicating that the community still rejecting the new LUNA and keep reminding the community to burn LUNC (the new name of old LUNA). The Lunatics already lose their faith in Terra blockchain and even some of them are planning to sell the new LUNA as soon as they get the airdrops. The increase of negative sentiment within Lunatics community was in line with the previous study by Wang, Schuetz, & Cai (2021) on crisis response strategies at social media. They found that different response strategies could result in different reactions from targeted community and one of the reactions that could be appeared was accusing the company and spreading negative information (Wang et al., 2021). While the community was against the company and more negative sentiment spread, the company should initiate more discussions with the community to open possibilities for other choices (Wang et al., 2021). In Terra LUNA crash events, there were opportunities to contribute to the recovery plan by participating in proposal vote, but unfortunately the vote results were not as expected by Lunatics community. This can be seen as more mentions from Lunatics were supporting burning solution than network forking. In results, there were even more negative sentiment and rumors spread within the community. Therefore, as stated by Wang, Schuetz, & Cai (2021) public opinion monitoring was important step that need to be done in the middle of crisis so company could give the right response, especially when the negative mentions were more dominant than positive ones.

Rumor Clarification

Do Kwon also published several clarifications regarding rumors that spread in the community about how he gained profits before the crash and how he used a mysterious LUNA wallet to win the proposal voting. The first clarification was on 21 May 2022, and it can be categorized as denial as part of the crisis response strategies. The second clarification was on 12 June 2022, and it also can be categorized as denial as he refused to answer a question from community influencer @FatManTerra regarding the rumor. The next day on 13 June 2022 the rumors became trending among the community as @FatManTerra tweeted the screenshot of his conversation with Do Kwon on 21 May 2022 when he denied the rumor (Karunanidhi, 2022). On that day the number of negative mentions increased more than twice the number of positive mentions, therefore the denial strategy was failed to neutralize the negative sentiment. These findings also consistent with the study from Jain (2022) that emphasized on the importance of opinion leaders to control rumors in social media during crisis. Therefore, instead of denying or refusing to comment, it is important for to clarify any rumors that spread on social media.

Another caused of negative sentiment among the Lunatics community was about the collapse of Celcius Network and how LUNA crash was related with the fall of that one of the leading cryptocurrency investment companies. In this case, Do Kwon and Terra LUNA official account did not specifically mention about Celcius Network. Instead on one of his tweets, Do Kwon remind the community about how cryptocurrency works as decentralized system and how to survive in this industry (Do Kwon 🟡 [@stablekwon], 2022f). Instead of responding to the crisis and rumors, Do Kwon has acted as one of influential public figures that encouraging the community to keep their confident in cryptocurrency, as the fall of Terra LUNA and Celcius Network have become industrial crisis for cryptocurrency.

Community Interactions

The interaction patterns found within the Lunatics community also support findings by previous studies about virtual community interactions by Lizzo & Liechty (2020). The Lunatics community has its own hashtags to identify themselves and to increase their senses of belonging. They also have their own ways to support each other in the middle of the crisis, by simply replying, retweeting, and mentioning each other to show their unity as Lunatics community. On 26 June 2022, the power of community has moved the market sentiment and there were more positive than negative mentions that mainly consisted of how the Lunatics still believe in the recovery of LUNA Classic (LUNC) and keep encouraging each other to burn their LUNC coins in order to increase the value of it. Therefore, as stated by Oltra González et al. (2021) it is important for company or organization to always maintain a good relationship and emotional bonding with its community so when the crisis happened the community will keep supporting the recovery process.








The roles of influencers and public figures were important in the middle of crisis. Several trusted public figures such as the founder and CEO of Binance exchange Changpeng Zhao (@cz_binance) also gave his opinion that burn was the right way to increase the value of a cryptocurrency (CZ 💎 Binance [@cz_binance], 2022). In this LUNA crash incident, the community members have more trust in those influential figures than in Do Kwon as the founder and CEO of Terra Blockchain. They keep believing what influencers and public figures said that burning was the right solution instead of the network forking solution as the official and chosen recovery plan. These findings were in line with the study by Tjahyana (2021) on cryptocurrency virtual community, as the role of influencers was very important for community to make decisions especially regarding the future of their investment.

Finally, future studies should include the price movement as part of indicators to measure the effectiveness of crisis response strategies in the cryptocurrency communities. Also, future research could try to observe more private communities such as groups, channels, and servers in Telegram, Discord, and WhatsApp.

6. Conclusions

This study has found that the right crisis response strategies are needed in the time of crisis as different strategies could result in different community sentiment. Mortification and corrective action were proven to be the right strategies that must be carried out at the same time to generate more positive sentiment in the community. When rumors spread during crisis, instead of denying the rumors company should clarify the situation to prevent more negative sentiment spread in the community. Communities have significant influence in generating positive or negative sentiment on social media during crisis events. Therefore, it is very important to always maintain strong relationship with the community so when the crisis happened, they will fully support the recovery process and stay loyal to the company. Moreover, company should spare time and budget to have great mutual relationship with the community, such as organizing events, giveaways and meetups. Furthermore, it is very important to maintain good relationship with influencers and public figures especially in cryptocurrency communities, as they have important roles in driving community sentiment during crisis. Finally, it is crucial to always monitor social media sentiment as an indicator to measure the success of crisis response strategies.

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Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community

Abstract

Cryptocurrency is a speculative investment due to its volatility that could result in large returns but also could end in crashes. Terra blockchain collapsed when its stablecoin UST failed to maintain its peg to 1 USD and caused its sister coin LUNA to drop for more than 90% only in few days. Terra LUNA itself has gained its success and attracted many investors that became a strong community called Lunatics. Using Netnography, this study tried to observe crisis response strategies from Do Kwon as founder and CEO of Terraform Labs and from Terra LUNA official Twitter account during the crash. Also, this study used community sentiment as an indicator to measure the success of the strategies. Moreover, this study observed the interaction within the community during the crash and how they survived to overcome the crisis together. The results show that the mortification and corrective action are the most effective strategy to generate positive sentiment. However, denials toward rumors cause more negative sentiment within community. Despite the recovery plan from Terra network, Lunatics community also has its own ways to recover from the crisis. This study also revealed that community influencers roles are crucial in controlling rumors during the crisis.

Keywords: crisis; crisis response strategies; cryptocurrency; community; crash; sentiment

1. Introduction

Cryptocurrency as digital currency gained more popularity because of its decentralized system running on blockchain technology that considered more secure and transparent as an alternative form of digital payment and investment (Koroma et al., 2022). As a speculative investment, cryptocurrency high volatility could result in large returns but also could end in price bubbles (Grobys & Junttila, 2021). Price bubbles in cryptocurrency are conditions where the price slowly rises at the beginning and then increasing faster because of the excitement of the market and the rising demand (Phillips & Gorse, 2017). However, cryptocurrency market can change very fast due to volatility, and price bubbles could be followed by market crash or other extreme conditions (Sebastião & Godinho, 2021). Cryptocurrency crash happened several times such as on March 11, 2020 when the World Health Organization (WHO) stated Covid-19 outbreak as a worldwide pandemic that caused cryptocurrency market lost almost half of its capitalization value (Umar, Jareño, & González, 2021).

Another dramatic crash happened on May 2022, when Terra blockchain with its main coins Terra UST and Terra LUNA collapsed (Kim et al., 2022). Terraform Labs that based on South Korea was founded by Daniel Shin and Do Kwon on January 2018 and has attracted attention of many investors worldwide (“Terra Price Today, LUNA to USD Live, Marketcap and Chart,” 2022). Kim et al. (2022) reported that Terra crash started when the stablecoin algorithm failed to keep UST price pegged to 1 USD. It started when over 2 billion USD worth of UST was drawn from Anchor Protocol on May 7, 2022 that immediately triggered other selling of other millions of UST (Boom, 2022). Traders tried to make profit from this situation by swapping UST to LUNA that in result added more LUNA in circulation and make its price collapsed (Shen, 2022). LUNA price drastically dropped from almost 120 USD in April 2022 to 0,01 USD in May 13, 2022 (Boom, 2022).

However, despite the devastating event, Terra LUNA has strong support from its community (Melinek, 2022). The community member called themselves Lunatics, and they still showing

their loyal support during and after the crash (Melinek, 2022). As mentioned in Terra official website, the community use hashtag #LUNAtics to identify the posts and discussions on social media, particularly on Discord, Twitter, Telegram, Reddit, and other media such as blog on Medium ("Terra Money - Community," n.d.).

There are previous studies on virtual community, such as a research on a Facebook leisure-based virtual community by Lizzo and Liechty (2020). Using netnography method, they discovered that the virtual community sense of belonging was experienced through sharing both negative and positive experiences and by supporting each other during several virtual racing events or other specific occasions (Lizzo & Liechty, 2020). Another netnography study was conducted by Tjahyana (2021) on Dogecoin cryptocurrency community on Twitter. The study found that Dogecoin cryptocurrency community support each other by replying and reacting to the tweets (Tjahyana, 2021). Furthermore, Ballinari & Behrendt (2021) stated that it is very important to keep social media sentiment positive towards an investment, as it could make the investors feel optimistic and tend to hold their investment. Therefore, as described by Agarwal, Aziz, & Zhuang (2022), it is crucial to give the right clarification and verified information on social media to reduce uncertainties and doubt because of the crisis, especially when a lot of rumors already spread.

The purpose of this study was to observe crisis response strategies that Do Kwon, Terraform Labs and other Terra LUNA influencers were trying to implement during the crash. Also, this study monitored and analyzed Lunatics community sentiment as a success indicator of the crisis communication strategy. Netnography was used as the method to participate and discover the communication pattern and interaction during the crash. This study focused on interactions and conversation on social media Twitter as one of the main public channels for Lunatics community.

2. Literature review

2.1. Crisis Response Strategies

When crisis happened, the right crisis communication strategy is needed, such as implementing crisis response strategies in order to reduce the consequences and decrease the reputational risks of an organization (Triantafyllidou & Yannas, 2020). Benoit (as cited in Triantafyllidou & Yannas, 2020) discovered five ways of crisis response strategy in order to restore reputational image. The first one is denial, when the organization directly denies the incident that happened or when the organization specifies other parties were responsible for the crisis (Triantafyllidou & Yannas, 2020). The strategy is responsibility evasion, when the organization includes other factors to be the cause of the incident that were uncontrollable and were not meant to be happened (Triantafyllidou & Yannas, 2020). Furthermore, another strategy is to reduce the offensiveness, which involves exposing the positive actions and achievements in the past and also minimize the crisis negative effect by giving compensation to the ones that affected (Ferguson, Wallace, & Chandler, 2018). Moreover, mortification is also included in one of the crisis strategy response, as the organization admit the incident, and accept to be responsible for the crisis (Ferguson et al., 2018). Next, corrective action as crisis response strategy is used as the organization try to recover the situation and conduct preventive action to avoid reoccurrence of the incident (Ferguson et al., 2018). According to Triantafyllidou & Yannas (2020), corrective action is the most effective way as crisis response strategy through social media. They stated that posts and messages that convey corrective actions generated

more positive engagement through likes, comments, and shares (Triantafillidou & Yannas, 2020).

2.2. Rumor Clarification and Community Sentiment

During crisis events, rumour often propagated among social media users and clarification is needed to help users determine the next acts to be made in response to the crisis (Agarwal et al., 2022). Rumour itself has certain characteristics, which includes any type of information that could be true or false and has not been clarified by trusted sources (Zhao, Resnick, & Mei as cited in Agarwal et al., 2022). Moreover, during a crisis several different rumors could be spread on social media, therefore organization has to choose the right rumor to be clarified and publish the clarification on the right time through social media, so it can eliminate uncertainties among social media users (Agarwal et al., 2022).

Several studies have tried to find connection between social media sentiment and cryptocurrency price movement. By using Latent Dirichlet designation (LDA) data processing model, a study from Poongodi M., Nguyen, Hamdi, & Cengiz (2021) on social media data related to Bitcoin discussions has found that sentiment on social media could be used to predict global cryptocurrency price. Furthermore, a study from Hassan, Hudaefi, & Caraka (2021) using automated web scrapping and machine learning has discovered that sentiment on Twitter reflected cryptocurrency market conditions. Another study on social media sentiment analysis, conducted by Ortu, Vacca, Destefanis, & Conversano (2022) found and categorized cryptocurrency related top words based on discussion topics, such as "money", "time", "wallet" for personal investment topic, and "power", "believe", "address" for Bitcoin & blockchain topic, and "pay", "fee", "rate" for trading topic.

2.3. Virtual Community

McMillan & Chavis (as cited in Lizzo & Liechty, 2020) identified four factors for developing sense of community, which are : membership, influence, integration, and fulfillment of needs. They found that membership in virtual community includes unique symbols and terms that they use to communicate and indentify themself as part of the community and it brings the members closer to each other (Lizzo & Liechty, 2020). The next factor is influence, that is when members feel the joy and satisfaction when they can bring impact not just for the community but also for larger targets and societies (Lizzo & Liechty, 2020). Moreover, Lizzo & Liechty (2020) also stated that integration and fulfilment of needs could be seen when members share the same passion and excitement within the community. The members can support each other by sharing and celebrating personal achievement or even by giving encouragement and motivation for members that need emotional support (Lizzo & Liechty, 2020). A study on a Twitter based cryptocurrency community conducted by Tjahyana (2021), found that there are five communication patterns that occurred in the community. The first pattern is self indentification by using unique hashtags or cashtags and the second pattern is to interact with each other by giving likes and replies in discussions (Tjahyana, 2021). The next pattern is to give motivation and encouragement to each other especially during bad market conditions (Tjahyana, 2021). Furthermore, Tjahyana (2021) also discovered the fourth pattern when the community members often mention the influencers and public figures accounts, hoping that they will give confirmation about the future of the cryptocurrency investment (Tjahyana, 2021). Finally, the last pattern is when influencers and public figures give encouragement, motivation, and supports to the community to keep holding their cryptocurrency investment (Tjahyana, 2021).

3. Methods

This study used Netnography as qualitative method to observe and investigate communication and interaction within Lunatics community, especially during crisis that happened because of Terra LUNA crash in May 2022. Netnography is a method to observe, understand and interpret communication and interaction within virtual communities on the internet (Ahuja & Shakeel, 2017). According to Kozinets (2018), netnographers have flexibilities on becoming active participants or just passive observants in the community.

This study used netnography with these following steps :

- i. Netnographer (researcher for netnography) joined several cryptocurrency communities on Twitter, Telegram and other social media as a passive participant for more than 6 months.
- ii. Netnographer tried to observe and understand the communication and interactions especially within Lunatics communities and took notes some cultural insights.
- iii. Data collection was conducted using Brand24 as media monitoring software to collect and analyze conversation data related with Lunatics communities, especially the ones related with Terra LUNA crash.
- iv. Sentiment analysis also done using Brand24 and netnographer categorized data based on sentiment and cultural insight found in the community.
- v. Netnographer make communication patterns that focused on crisis response strategy and qualitatively measured its success based on conversation sentiment.

4. Results

4.1. Sentiment Data

This research used Brand24 as monitoring tools to collect and analyze data from media social and mainstream media. To get data related with Terra LUNA crash, this study used "#Luna" as the main keyword. In addition, other filter keywords used to get more specific data, such as "crash", "cryptocurrency", "Do Kwon", "UST", "Bitcoin", and other related keywords. Data collection was conducted between 5 May until 30 June 2022 to cover several important events during the crash. All mentions data that had been collected were also analyzed and categorized into three types of sentiment, which are positive, neutral, and negative sentiment. During the selected time frame, there were total 157.364 mentions collected, with 19.192 positive mentions and 23.525 negative mentions. Moreover, there were several different days that have more data mentions than the rest of the days within the timeframe. As shown on Table 1, those days also have significant number of negative or positive mentions compare with other days.

Table 1. Positive and Negative Sentiment Data

No.	Date	Positive mentions	Negative mentions
1	11 May 2022	626	1.207
2	16 May 2022	671	525
3	22 May 2022	1.076	469
4	28 May 2022	363	537
5	13 June 2022	511	1.235
6	15 June 2022	424	963
7	18 June 2022	585	972
8	22 June 2022	441	618
9	26 June 2022	613	396

Source : Brand24

Furthermore, keyword "Lunatics" was added to collect mentions that specifically related with Lunatics community, and as the result it has 7.321 mentions with 1.079 negative mentions and 1.291 positive mentions. Especially on 22 May 2022 there was significant increase in positive mentions with keyword "Lunatics" as we can see the spiking positive mentions in the chart, as shown in Figure 2. The general sentiment data chart could also be seen in Figure 1.

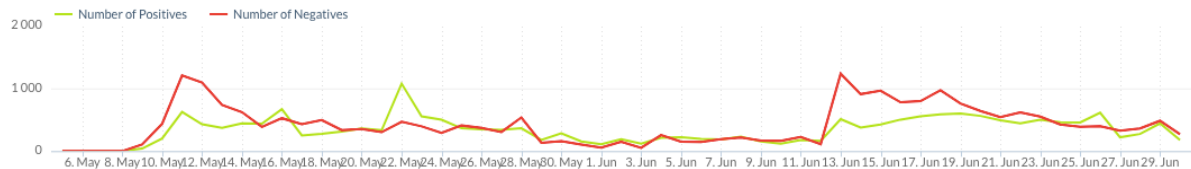


Figure 1. General sentiment chart for keyword "Luna"

Source : Brand24

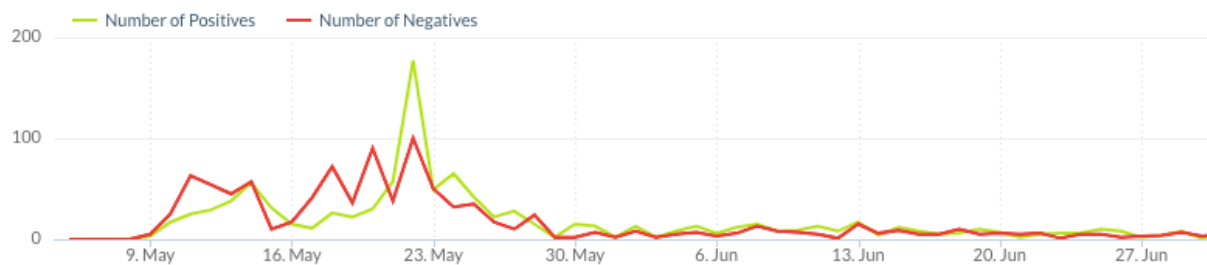


Figure 2. Community sentiment chart for keyword "Lunatics"

Source : Brand24

4.2. Response data categorization

Using netnography method, this research also observed conversations and messages related with the crash, specifically the ones that related to crisis response strategy from Do Kwon Twitter personal account (@stablekwon) and Terra LUNA official Twitter account (@terra_money).

4.2.1. During the crisis

On 11 May 2022 when Terra UST already lost its 1 USD peg for the second time and pushed down as low as 35 cents (Genç, 2022), Do Kwon tweeted through a thread on his personal account as he tried to clarify the situation and informed the community about the recovery plan. These were several words from his tweet:

"1/ Dear Terra Community:

2/ I understand the last 72 hours have been extremely tough on all of you - know that I am resolved to work with every one of you to weather this crisis, and we will build our way out of this.

Together"

(Do Kwon 🟡 [@stablekwon], 2022a)

The official account of Terra LUNA also did the same by giving statements and clarification about the crash. Here are some tweets from the thread:

"1/ Liquidity brawl behind the scenes amid material \$UST peg deviation on third-party venues.

Fighting back. More updates are incoming #LUNAtics. Hang on, fam.

Here are some resources to combat misinformation:

2/ UST MCAP > LUNA -- No death spiral happens."

(Terra 🌍 Powered by LUNA 🟡 [@terra_money], 2022a)

There was another thread from Do Kwon on 16 May 2022 when he addressed the community to show how heartbroken he was and to inform them the recovery efforts he had done up until that time.

"I've spent the last few days on the phone calling Terra community members – builders, community members, employees, friends and family, that have been devastated by UST depegging.

I am heartbroken about the pain my invention has brought on all of you."

(Do Kwon 🟡 [@stablekwon], 2022b)

On 21 May 2022, Do Kwon did several interactions with the community by replying tweets related to the crash. All the questions that addressed to him were mostly about the recovery plan and about Do Kwon's commitment to resolve the problem. This study listed some of Do Kwon tweets when he actively participate in the discussion in response to the community doubts, such as :

*"My priority is not about what happens to me, but making sure the Terra community has a place to build and years of their work does not go to waste
I dont care what happens to me as long as that happens"*

(Do Kwon 🟡 [@stablekwon], 2022c)

However, there were debates among the members of Lunatics community because they doubted that the network separation plan or commonly referred as network fork was the best solution and they believed that burning plan will be the right solution to recover the value of LUNA (Irwan & Julianto, 2022). The increase of positive mentions on 22 May 2022 mostly consisted of the keyword "Lunatics" as seen on Figure 2 as the community encourage each other to keep on burning LUNA. The example of community tweet that listed on Brand24 as one of popular tweets with keyword Lunatics is a tweet from Michel MB [@MichelMB19] (2022).

We are #LUNAtics We will burn the shit out of #LUNA .

We are the community!!! We need whales with us.

#RETWEEET #lunaburn

(Michel MB [@MichelMB19], 2022)

4.2.2. During the recovery phase

Terra 2.0 was launched on 28 May 2022 as part of the recovery plan and the old LUNA code has been changed into LUNC for LUNA Classic. The launching was officially announced a day before on 27 May 2022 on Terra LUNA official account. Several days before the launch, Do

Kwon also gave information about all the exchanges that supported Terra 2.0 and the new LUNA airdrops to existing LUNA holders.

"1/ Yesterday, we said Terra 2.0 is coming. Tomorrow, it arrives.

The community has been working around the clock to coordinate the new chain's launch. Subject to potential change, we expect Terra to go live on May 28th, 2022 at around 06:00 AM UTC."

(Terra 🌐 Powered by LUNA 🟡 [@terra_money], 2022c)

4.2.3. Rumors and negative events

On 13 June 2022 there were significant increase in the number of mentions. This was happened because there were negative rumors spread about Do Kwon gained a lot of fortune by cashing out \$28 billion worth of LUNA before the crash (Bertillo, 2022). Also, there were other rumors that already started to spread on 21 May 2022 stated that Do Kwon used an unknown 20 Million LUNA wallet to vote on the fork proposal, (Karunanidhi, 2022). On 12 June 2022 Do Kwon published a thread on his personal Twitter account to give clarification regarding the rumors.

"1/ This should be obvious, but the claim that I cashed out \$2.7B from anything is categorically false"

(Do Kwon 🟡 [@stablekwon], 2022e)

Moreover, on 21 May 2022 Do Kwon already gave statement regarding the voting rumors, on his discussion with a community influencer @FatManTerra (Karunanidhi, 2022).

*Replying to
@FatManTerra @husseinAjy
and 3 others*

Token purchase agreement holder with TFL. Besides that I decline to respond.

(Do Kwon 🟡 [@stablekwon], 2022d)

4.2.4. Lunatics community's data interactions

This study also collected and categorized Lunatics community mentions with Brand24 and listed several popular mentions based on the sentiment and the amount of likes and shares. Moreover, we also observed and collected data from Twitter. To make sure about ethical standard of this netnography research, this report shows summary of the tweets contents but does not write down the usernames of the Twitter accounts. These are several interaction patterns among Lunatics that occurred during the crash:

- i. Using hashtag #LUNAtics as identification.
- ii. Using hashtag #LUNC, #LUNCburn, #LUNAburn, #LUNAcClassic for those who still believe in the recovery of LUNA classic (LUNC) and encourage each other to burn their LUNC to increase the value of it.

- iii. Creating micro influencers accounts to give updates about the latest price movements, news, and to keep reminding Lunatics community about the burning strategy.
- iv. Using greetings or phrases for casual tweets such as "dear fellow Lunatics", "good morning", "what a great day", "good night", and "stay safe #LUNC army".
- v. Showing empathy for those who suffered a lot of loss during the crash.
- vi. Giving encouragement, with words and phrases such as "holding strong", "stay strong", "together", "big news is coming", "pumping", "bullish", "rise from the grave", "going crazy", "accumulating", "Luna \$1", "moon", "survive", "explode" and "rocket".
- vii. Organizing event to facilitate NFTs, airdrops and giveaways, especially for those who suffered a lot of loss.
- viii. Mentioning or replying Do Kwon (@stablekwon), Terra official account (@terra_money) and other public figures such as Changpeng Zhao (@cz_binance) and Elon Musk (@elonmusk) when the community questioning, reporting or confirming issues regarding the crash.

Several influencers and public figures in cryptocurrency community also gave their opinion regarding the crash and the recovery plan, such as Changpeng Zhao (@cz_binance) who also the founder and CEO of Binance. He tweeted his opinion while replying some questions addressed to him regarding the fork recovery plan from Terra LUNA.


*"Reducing supply should be done via burn, not fork at an old date, and abandon everyone who tried to rescue the coin.
I don't own any LUNA or UST either. Just commenting."*

(CZ  Binance [@cz_binance], 2022)

5. Discussion

This study gathered several mentions, categorized, and analyzed it based on the dates, sentiments, crisis response strategy and community interactions patterns. Collected Twitter mentions from Do Kwon as the co-founder and CEO of Terraform Labs and official Twitter account of Terra LUNA can be categorized into several crisis response strategies in accordance with the social media crisis communication strategies discussed by Triantafillidou & Yannas (2020). Also, some of the mentions contained rumor clarification, as stated by Agarwal et al. (2022) that publishing rumor clarification on social media is also one of important strategies during the crisis.

5.1. Crisis Response Strategies

At the early stage of the crisis on 11 May 2022, Do Kwon tweeted a thread on his personal account @stablekwon to inform community about the current crash situation (Do Kwon  [@stablekwon], 2022a). This thread consists of several different crisis response strategies. The first was mortification, as he admitted the problems that caused the crash and the next was corrective action as he informed the current situation and recovery plan for Terra UST. In addition, the strategy of reducing the offensiveness also been used by exposing positive achievements in the past such as reminding the community about the success of Terra

ecosystem and how it has survived the previous setback a year before the crash. However, those strategies cannot neutralize the negative sentiment, as there were more negative than positive mentions as shown on Table 1 and Figure 1.

The next strategy was mortification as on his personal Twitter account in a thread on 14 May 2022 Do Kwon showed how heartbroken he was about the crash and how it caused a lot of pain to the community (Do Kwon 🟡 [@stablekwon], 2022b). He did not deny that Terra framework as his invention has made a lot of people suffer. Furthermore, the thread also can be categorized as corrective action strategy as Do Kwon also informed the community about the recovery plan and even stated that the Terra UST has failed and will not be part of the next recovery plan. Terra LUNA official account also post clarification on 15 May 2022 about rumors that could be spread on social media during the crisis, by reminding the community that all official updates only posted on @terra_money and others were only fake accounts (Terra 🌍 Powered by LUNA 🟡 [@terra_money], 2022b). The next day, on 16 May 2022 there were an increase in the number of positive mentions and a decrease in the number of negative mentions as shown in Table 1 and Figure 1. In contrast with what Triantafillidou & Yannas (2020) found in their studies on crisis response strategies, corrective action strategy itself was not proved to be the most effective strategy in generating more positive engagements in the community. This study found that mortification combined with corrective action could result in more positive mentions in the community, as stated by Oltra González, Camarero, & San José Cabezudo (2021) that it is important to show empathy and to show that the company understand the emotions of the community that affected by the crisis, so they will feel optimistic towards the company.

There were significant number of positive mentions on 22 May 2022 as shown on Table 1, Figure 1, and Figure 2. On that day, Do Kwon did reply to a lot of tweets from the community that addressed to him. The replies were consisted of several crisis response strategies, including mortification, corrective actions, and rumor clarifications. In addition, several days before on 19 May 2022 Terra LUNA official account also retweeted Do Kwon's announcement about proposal voting regarding several recovery plans that could be categorized as corrective action strategy. However, the analyzed mentions data showed that the positive mentions came from the Lunatics community contained messages that indicating disapproval of the proposal. Most of the Lunatics were encouraging each other to keep on burning LUNA as they believed it was the right solution for recovery. Therefore, the mentions from Lunatics community were showing positive sentiment for LUNA as a cryptocurrency as they believe that the whole community can work together to recover its value. These findings were in line with previous studies by Xie, Pinto, & Zhong (2022) about community resilience during crisis events. They stated that social media engagement by interacting and supporting each other were very important to strengthen community resilience during crisis, so they can survive and overcome the crisis together (Xie et al., 2022).

Moreover, as can be seen on Table 1 and Figure 2, the mentions data collected with "Lunatics" as the filter keyword show a spiking rise of positive mentions more than double the number of negative mentions. Unfortunately, the positive sentiment did not show their confident in Do Kwon's recovery plan which was the network forking. This data indicates that the community has significant influence to move market sentiment, regardless the crisis responses strategies that have been done by the responsible party.

The new LUNA as the result of Terra blockchain forking has been launch on 28 May 2022 and the announcement already published several days before as part of corrective action strategy. Besides the rebirth of LUNA, existing old LUNA holders also got new LUNA airdrops as part of the compensation, and this could be categorized as reduce offensiveness strategy. However, these strategies could not neutralize the sentiment, and based on the data shown on Table 1, there were more negative mentions than positive mentions in the community at the

same day with the launching of new LUNA. Based on the netnographer observation and data analysis with Brand24, there were several top negative mentions on this day indicating that the community still rejecting the new LUNA and keep reminding the community to burn LUNC (the new name of old LUNA). The Lunatics already lose their faith in Terra blockchain and even some of them are planning to sell the new LUNA as soon as they get the airdrops. The increase of negative sentiment within Lunatics community was in line with the previous study by Wang, Schuetz, & Cai (2021) on crisis response strategies at social media. They found that different response strategies could result in different reactions from targeted community and one of the reactions that could be appeared was accusing the company and spreading negative information (Wang et al., 2021). While the community was against the company and more negative sentiment spread, the company should initiate more discussions with the community to open possibilities for other choices (Wang et al., 2021). In Terra LUNA crash events, there were opportunities to contribute to the recovery plan by participating in proposal vote, but unfortunately the vote results were not as expected by Lunatics community. This can be seen as more mentions from Lunatics were supporting burning solution than network forking. In results, there were even more negative sentiment and rumors spread within the community. Therefore, as stated by Wang, Schuetz, & Cai (2021) public opinion monitoring was important step that need to be done in the middle of crisis so company could give the right response, especially when the negative mentions were more dominant than positive ones.

5.2. Rumor Clarification

Do Kwon also published several clarifications regarding rumors that spread in the community about how he gained profits before the crash and how he used a mysterious LUNA wallet to win the proposal voting. The first clarification was on 21 May 2022, and it can be categorized as denial as part of the crisis response strategies. The second clarification was on 12 June 2022, and it also can be categorized as denial as he refused to answer a question from community influencer @FatManTerra regarding the rumor. The next day on 13 June 2022 the rumors became trending among the community as @FatManTerra tweeted the screenshot of his conversation with Do Kwon on 21 May 2022 when he denied the rumor (Karunanidhi, 2022). On that day the number of negative mentions increased more than twice the number of positive mentions, therefore the denial strategy was failed to neutralize the negative sentiment. These findings also consistent with the study from Jain (2022) that emphasized on the importance of opinion leaders to control rumors in social media during crisis. Therefore, instead of denying or refusing to comment, it is important for to clarify any rumors that spread on social media.

Another caused of negative sentiment among the Lunatics community was about the collapse of Celcius Network and how LUNA crash was related with the fall of that leading cryptocurrency investment companies. In this case, Do Kwon and Terra LUNA official account did not specifically mention about Celcius Network. Instead on one of his tweets, Do Kwon remind the community about how cryptocurrency works as decentralized system and how to survive in this industry (Do Kwon 🍌 [@stablekwon], 2022f). Instead of responding to the crisis and rumors, Do Kwon has acted as one of influential public figures that encouraging the community to keep their confident in cryptocurrency, as the fall of Terra LUNA and Celcius Network have become industrial crisis for cryptocurrency.

5.3. Community Interactions

The interaction patterns found within the Lunatics community also support findings by previous studies about virtual community interactions by Lizzo & Liechty (2020). The Lunatics community has its own hashtags to identify themselves and to increase their senses of belonging. They also have their own ways to support each other in the middle of the crisis, by simply replying, retweeting, and mentioning each other to show their unity as Lunatics community. On 26 June 2022, the power of community has moved the market sentiment and there were more positive than negative mentions that mainly consisted of how the Lunatics still believe in the recovery of LUNA Classic (LUNC) and keep encouraging each other to burn their LUNC coins in order to increase the value of it. Therefore, as stated by Oltra González et al. (2021) it is important for company or organization to always maintain a good relationship and emotional bonding with its community so when the crisis happened the community will keep supporting the recovery process.



The roles of influencers and public figures were important in the middle of crisis. In this LUNA crash incident, the community members have more trust in those influential figures than in Do Kwon as the founder and CEO of Terra Blockchain. They keep believing what influencers and public figures said that burning was the right solution instead of the network forking solution as the official and chosen recovery plan. These findings were in line with the study by Tjahyana (2021) on cryptocurrency virtual community, as the role of influencers was very important for community to make decisions especially regarding the future of their investment.

Finally, future studies should include the price movement as part of indicators to measure the effectiveness of crisis response strategies in the cryptocurrency communities. Also, future research could try to observe more private communities such as groups, channels, and servers in Telegram, Discord, and WhatsApp.

6. Conclusions

This study has found that the right crisis response strategies are needed in the time of crisis as different strategies could result in different community sentiment. Mortification and corrective action were proven to be the right strategies that must be carried out at the same time to generate more positive sentiment in the community. When rumors spread during crisis, instead of denying the rumors company should clarify the situation to prevent more negative sentiment spread in the community. Communities have significant influence in generating positive or negative sentiment on social media during crisis events. Therefore, it is very important to always maintain strong relationship with the community so when the crisis happened, they will fully support the recovery process and stay loyal to the company. Moreover, company should spare time and budget to have great mutual relationship with the community, such as organizing events, giveaways, and meetups. Furthermore, it is very important to maintain good relationship with influencers and public figures especially in cryptocurrency communities, as they have important roles in driving community sentiment during crisis. Finally, it is crucial to always monitor social media sentiment as an indicator to measure the success of crisis response strategies.

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**3. Bukti proses Review dan bukti email "Revisions
Required" serta bukti isi review dari para Reviewer
(24 Oktober 2022)**



[ijbs] Editor Decision

2022-10-24 02:41 PM

Lady Joanne Tjahyana:

We have reached a decision regarding your submission to Petra International Journal of Business Studies, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community".

Our decision is: Revisions Required

Reviewer A:

Recommendation: Accept Submission

Is the topic appropriate for publication in this journal?

Yes

Is the coverage of the topic sufficiently comprehensive and balanced?

Yes

General Feedback and Comments (for Author):

The writing of the topic of the paper is quite systematic, because this paper is related to the Crisis Response Strategy, so there should be an explanation of the managerial benefits that are included in the background as well as in the discussion and recommendations.

Comments and recommendation **(Only for the Editor - hidden to the Author):**

Recommendation:

published with revisions



[ijbs] Editor Decision

2022-10-24 01:28 PM

Lady Joanne Tjahyana:

We have reached a decision regarding your submission to Petra International Journal of Business Studies, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community".

Our decision is: Revisions Required

Reviewer B:

Recommendation: Revisions Required

Is the topic appropriate for publication in this journal?

Yes

Is the coverage of the topic sufficiently comprehensive and balanced?

Yes

General Feedback and Comments (for Author):

The topic is very interesting and the paper is well organized. To improve the quality of this paper, the following suggestions are given:

1. Please do proofreading the paper.
 2. Please follow the journal template by downloading it from this link:
https://ijbs.petra.ac.id/public/files/IJBS_file_2_main_content.docx
 3. Please edit the paper to reduce plagiarism. This paper has plagiarism of 16%. Please reduce to 10%
- Good luck

Comments and recommendation **(Only for the Editor - hidden to the Author):**

Recommendation:

published with revisions

[ijbs] Editor Decision

2 messages

IJBS Editor-in-Chief <ijbs@petra.ac.id>
To: Lady Joanne Tjahyana <joanne@petra.ac.id>

24 October 2022 at 13:28

Lady Joanne Tjahyana:

We have reached a decision regarding your submission to Petra International Journal of Business Studies, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community".

Our decision is: Revisions Required

Reviewer B:
Recommendation: Revisions Required

Is the topic appropriate for publication in this journal?

Yes

Is the coverage of the topic sufficiently comprehensive and balanced?

Yes

General Feedback and Comments (for Author):

The topic is very interesting and the paper is well organized. To improve the quality of this paper, the following suggestions are given:

1. Please do proofreading the paper.
 2. Please follow the journal template by downloading it from this link: https://ijbs.petra.ac.id/public/files/IJBS_file_2_main_content.docx
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Comments and recommendation (**Only for the Editor - hidden to the Author**):

Recommendation:

published with revisions

Petra International Journal of Business Studies

IJBS Editor-in-Chief <ijbs@petra.ac.id>
To: Lady Joanne Tjahyana <joanne@petra.ac.id>

24 October 2022 at 14:41

Lady Joanne Tjahyana:

We have reached a decision regarding your submission to Petra International Journal of Business Studies, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community".

Our decision is: Revisions Required

Reviewer A:
Recommendation: Accept Submission

Is the topic appropriate for publication in this journal?

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Is the coverage of the topic sufficiently comprehensive and balanced?

Yes

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[Quoted text hidden]



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4. Bukti submit Revisions pada OJS dan bukti artikel yang sudah direvisi berdasarkan review dari para Reviewer (29 Oktober 2022)

Bukti submit Revisions pada OJS

Workflow

Publication

Submission

Review

Copyediting

Production

Round 1

Round 1 Status

Submission accepted.

Notifications

[ijbs] Editor Decision	2022-10-24 01:28 PM
[ijbs] Editor Decision	2022-10-24 02:41 PM
[ijbs] Editor Decision	2022-11-01 03:16 PM
[ijbs] Editor Decision	2022-12-15 07:52 AM

Reviewer's Attachments

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Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community

Abstract

Cryptocurrency is a speculative investment due to its volatility that could result in large returns but also could end in crashes. Terra blockchain collapsed when its stablecoin UST failed to maintain its peg to 1 USD and caused its sister coin LUNA to drop for more than 90% only in few days. Terra LUNA itself has gained its success and attracted many investors that became a strong community called Lunatics. Using Netnography, this study tried to observe crisis response strategies from Do Kwon as founder and CEO of Terraform Labs and from Terra LUNA official Twitter account during the crash. Also, this study used community sentiment as an indicator to measure the success of the strategies. Moreover, this study observed the interaction within the community during the crash and how they survived to overcome the crisis together. The results show that the mortification and corrective action are the most effective strategy to generate positive sentiment. However, denials toward rumors cause more negative sentiment within community. Despite the recovery plan from Terra network, Lunatics community also has its own ways to recover from the crisis. This study also revealed that community influencers roles are crucial in controlling rumors during the crisis.

Keywords: crisis response strategies; cryptocurrency; community; Lunatics; sentiment

1. Introduction

Cryptocurrency has gained more popularity because of its decentralized blockchain technology system that considered to be more secure and transparent as a digital form of payment (Koroma et al., 2022). As an investment, cryptocurrency high volatility could result in large returns but could also cause price bubbles in the market (Grobys & Junttila, 2021). Price bubble is a condition where the price slowly rise and then increase faster due to the rising demand and excitement of the investors (Phillips & Gorse, 2017). However, price bubbles could end with market crashes and other extreme conditions (Sebastião & Godinho, 2021). Cryptocurrency crash happened several times such as on March 11, 2020 when the Covid-19 outbreak was declared as a worldwide pandemic by World Health Organization (WHO) and directly caused cryptocurrency market capitalization dropped to nearly half of its value (Umar, Jareño, & González, 2021).

Another dramatic crash happened in May 2022, when Terra blockchain with its main coins Terra UST and Terra LUNA collapsed (Kim et al., 2022). Terraform Labs that based on South Korea was founded by Daniel Shin and Do Kwon in January 2018 and has attracted many investors worldwide ("Terra Price Today, LUNA to USD Live, Marketcap and Chart," 2022). Kim et al. (2022) reported that Terra crash happened when the stablecoin algorithm failed to keep UST price pegged to 1 USD. It started when over 2 billion USD worth of UST was drawn from Anchor Protocol on May 7, 2022 and immediately triggered selling of other millions of UST (Boom, 2022). Traders tried to make profit from this situation by swapping UST to LUNA that automatically caused more LUNA added in circulation and make the price collapsed (Shen, 2022). LUNA price drastically dropped from almost 120 USD in April 2022 to 0,01 USD in May 13, 2022 (Boom, 2022).

Despite the devastating event, Terra LUNA has strong support from its community (Melinek, 2022). The community members called themselves Lunatics, and they still showing loyal support during and after the crash (Melinek, 2022). As mentioned in Terra official website, the

community use hashtag #LUNAtics as their identity on social media, particularly on Discord, Twitter, Telegram, and Reddit (“Terra Money - Community,” n.d.).

There are previous studies on virtual community, such as a research on a Facebook leisureed - based virtual community by Lizzo and Liechty (2020). Using netnography method, they discovered that the virtual community sense of belonging was experienced through sharing both negative and positive experiences and by supporting each other during several virtual events (Lizzo & Liechty, 2020). Another netnography study was conducted by Tjahyana (2021) on Dogecoin cryptocurrency community on Twitter. The study found that the members support each other by replying and reacting to the tweets (Tjahyana, 2021). Furthermore, Ballinari & Behrendt (2021) stated that it is very important to keep community sentiment positive on social media, as it could make investors feel optimistic and tend to hold their investment. Therefore, as described by Agarwal, Aziz, & Zhuang (2022), it is crucial to give verified clarification on social media during a crisis to reduce uncertainties and doubts, especially when many rumors have spread. Also, as described by Zhao & Chen (2022) in order to maintain positive sentiment towards a brand, an online community manager should have strong relationship with the community and give special privileges for active participants.

The purpose of this study was to observe crisis response strategies that Do Kwon, Terraform Labs and other Terra LUNA influencers tried to implement during the crash. Also, this study monitored and analyzed Lunatics community sentiment as a success indicator of the crisis communication strategy. Netnography was used to participate and discover the communication and interaction patterns during the crash. This study focused on Lunatics community on Twitter as one of the main public channels for the community.

2. Literature review

2.1. Crisis Response Strategies

When a crisis happened, the right crisis response strategies is needed, such as implementing strategies to reduce the consequences and to protect the reputation of an organization (Triantafillidou & Yannas, 2020). Benoit (as cited in Triantafillidou & Yannas, 2020) discovered five ways of crisis response strategy in order to restore reputational image. The first strategy is denial, which is done by denying the incident or mentioning other parties to be responsible for the crisis (Triantafillidou & Yannas, 2020). The next strategy is responsibility evasion which is happened when the organization includes other uncontrollable factors that were not meant to be happened (Triantafillidou & Yannas, 2020). Furthermore, reduce the offensiveness is another strategy which involves exposing positive actions in the past and minimizing the negative effect by giving compensation to the ones that affected by the crisis (Ferguson, Wallace, & Chandler, 2018). Moreover, mortification is also included in one of the strategies, as the organization admit the incident, and take responsibility for the crisis (Ferguson et al., 2018). Next, corrective action is a strategy that implemented to recover the situation and conduct preventive action to avoid reoccurrence of the incident (Ferguson et al., 2018). According to Triantafillidou & Yannas (2020), corrective action is the most effective strategy to be done through social media. They found that posts conveying corrective actions generated more positive engagement through likes, comments, and shares (Triantafillidou & Yannas, 2020).

2.2. Rumor Clarification and Community Sentiment

Agarwal et al. (2022) reports that during a crisis, rumors are often propagated among social media users. Therefore, clarification is needed to help users determine the next actions to be made in response to the crisis (Agarwal et al., 2022). Rumor itself has certain characteristics, which includes any type of unverified information that has not been clarified by trusted sources (Zhao, Resnick, & Mei as cited in Agarwal et al., 2022). Moreover, several different rumors could be spread on social media, therefore organization has to choose the right rumor to be clarified to eliminate uncertainties among social media users (Agarwal et al., 2022).

Several studies have tried to find connections between social media sentiment and cryptocurrency price movement. By using Latent Dirichlet designation (LDA), a study from Poongodi M., Nguyen, Hamdi, & Cengiz (2021) on Bitcoin related online discussions has found that sentiment on social media could be used to predict global cryptocurrency price. Furthermore, by using automated web scrapping and machine learning, Hassan, Hudaefi, & Caraka (2021) have discovered that sentiment on Twitter reflects cryptocurrency market conditions. Another study on social media sentiment analysis, conducted by Ortu, Vacca, Destefanis, & Conversano (2022) has categorized cryptocurrency related top words such as "money", "time", "wallet" for personal investment topic; "power", "believe", "address" for Bitcoin & blockchain topic; "pay", "fee", "rate" for trading topic.

2.3. Virtual Community

McMillan & Chavis (as cited in Lizzo & Liechty, 2020) identified four factors for developing sense of community. They found that membership is a factor in virtual community that consists of unique symbols and terms used by members to indentify themself as part of the community and it brings them closer to each other (Lizzo & Liechty, 2020). The next factor is influence, that is the feel of joy and satisfaction by making impact not only for the community but also for larger societies (Lizzo & Liechty, 2020). Moreover, Lizzo & Liechty (2020) also stated that integration and fulfilment of needs are factors that could be seen when members share the same passion and excitement within the community. The members can support each other by sharing and celebrating personal achievement or even by giving encouragement and motivation for members that need emotional support (Lizzo & Liechty, 2020). A study on a Twitter based cryptocurrency community conducted by Tjahyana (2021) discovered five communication patterns occurred in the community. The first pattern involves self identification by using unique hashtags or cashtags and the second pattern includes interacting with each other by giving likes and replies in discussions (Tjahyana, 2021). The third pattern consists of giving motivation and encouragement to each other especially during unfavaorable market conditions (Tjahyana, 2021). Furthermore, the fourth pattern occurs when the community members mention influencers and public figures to get confirmation about the future of the investment (Tjahyana, 2021). Finally, the last pattern involves influencers and public figures giving encouragement and motivation to the community to continue holding their investment regardless the market conditions (Tjahyana, 2021).

3. Methods

This study used Netnography as a qualitative method to observe and investigate communication and interaction within Lunatics community, especially during the crisis that happened due to Terra LUNA crash in May 2022. Netnography is a method to observe, understand and interpret communication and interaction within virtual communities on the

internet (Ahuja & Shakeel, 2017). According to Kozinets (2018), netnographers have flexibilities of becoming active participants or just passive observants in the community.

This netnography study was conducted with these following steps :

- i. Netnographer joined several cryptocurrency communities on Twitter, Telegram and other social media as a passive participant for more than 6 months.
- ii. Netnographer tried to observe and understand the communication and interaction within Lunatics communities and took notes of some cultural insights.
- iii. Brand24 as media monitoring software was used to collect and analyze conversation data related with Lunatics communities, especially the ones related with Terra LUNA crash.
- iv. Sentiment analysis was first done using Brand24 and continued by netnographer by categorizing data based on sentiment and cultural insight found in the community.
- v. Netnographer analyzed communication patterns that focused on crisis response strategies and qualitatively measured the success of those strategies based on the community sentiment.

4. Results

4.1. Sentiment Data

This research used Brand24 as monitoring tools to collect and analyze data from media social and mainstream media. To get data related with Terra LUNA crash, this study used "#Luna" as the main keyword. In addition, other keywords filters were used to get more specific data, such as "crash", "cryptocurrency", "Do Kwon", "UST", "Bitcoin", and other related keywords. Data collection was conducted between 5 May until 30 June 2022 to cover several important events during the crash. All mentions data that had been collected were also analyzed and categorized into two types of sentiment, which are positive, neutral, and negative sentiment. During the selected time frame, there were total 157.364 mentions collected, with 19.192 positive mentions and 23.525 negative mentions. Moreover, there were several different days that have more data mentions compare with other days within the timeframe. As shown on Table 1, those days also have significant number of negative or positive mentions. The general sentiment data chart could also be seen in Figure 1.

("Insert Table 1 about here")

("Insert Figure 1 about here")

Furthermore, keyword "Lunatics" was added to filter mentions that specifically related with Lunatics community, and as the result it has 7.321 mentions with 1.079 negative mentions and 1.291 positive mentions. Especially on 22 May 2022 there was significant increase in positive mentions with keyword "Lunatics" as we can see the spiking positive mentions on the chart, as shown in Figure 2.

("Insert Figure 2 about here")

4.2. Crisis response data categorization

Using netnography method, this research also observed conversations and messages related with the crash, specifically the ones that related to crisis response strategy from Do Kwon Twitter personal account (@stablekwon) and Terra LUNA official Twitter account (@terra_money).

4.2.1. During the crisis

On 11 May 2022 when for the second time, Terra UST already lost its 1 USD peg and dropped to almost 35 cents (Genç, 2022), Do Kwon tweeted a thread on his personal account as he tried to clarify the situation and informed the community about the recovery plan. These are several words from his tweet:

*"1/ Dear Terra Community:
2/ I understand the last 72 hours have been extremely tough on all of you - know that I am resolved to work with every one of you to weather this crisis, and we will build our way out of this.
Together"*
(Do Kwon 🟡 [@stablekwon], 2022a)

The official account of Terra LUNA also did the same by giving statements and clarifications about the crash. Here are several words from the thread:

*"1/ Liquidity brawl behind the scenes amid material \$UST peg deviation on third-party venues.
Fighting back. More updates are incoming #LUNAtics. Hang on, fam.
Here are some resources to combat misinformation:
2/ UST MCAP > LUNA -- No death spiral happens."*

(Terra 🌍 Powered by LUNA 🟡 [@terra_money], 2022a)

There was another thread from Do Kwon on 16 May 2022 as he addressed the community to show how heartbroken he was and to inform them about the recovery efforts that has been done up until that time.

*"1/ I've spent the last few days on the phone calling Terra community members – builders, community members, employees, friends and family, that have been devastated by UST depegging.
I am heartbroken about the pain my invention has brought on all of you."*
(Do Kwon 🟡 [@stablekwon], 2022b)

On 21 May 2022, Do Kwon made several interactions with the community by replying tweets related to the crash. All the questions that addressed to him were mostly about the recovery plan and about Do Kwon's commitment to resolve the problem. This study listed some of Do Kwon tweets when he actively participated in the discussion such as :

*"My priority is not about what happens to me, but making sure the Terra community has a place to build and years of their work does not go to waste
I dont care what happens to me as long as that happens"*

(Do Kwon 🟡 [@stablekwon], 2022c)

However, there were debates among the members of Lunatics community because they doubted that the network separation plan or commonly referred as network fork proposed by Do Kwon was the best solution (Irwan & Julianto, 2022). The community believed that coin burning will be the right solution to recover the value of LUNA (Irwan & Julianto, 2022). The increase of positive mentions on 22 May 2022 mostly consisted of the keyword "Lunatics" as the community members encouraged each other to keep on burning LUNA. The example of community tweet that listed on Brand24 as one of popular tweets is a tweet from Michel MB [@MichelMB19] (2022).

*We are #LUNAtics We will burn the shit out of #LUNA .
We are the community!!! We need whales with us.
#RETWEET #lunaburn*

(Michel MB [@MichelMB19], 2022)

4.2.2. During the recovery phase

Terra 2.0 was launched on 28 May 2022 as part of the recovery plan and the old LUNA code has been changed into LUNC for LUNA Classic. The launching was officially announced on Terra LUNA official account. Several days before the launch, Do Kwon also gave information about all the exchanges that supported Terra 2.0 and he also mentioned about the new LUNA airdrops for existing LUNC holders.

"1/ Yesterday, we said Terra 2.0 is coming. Tomorrow, it arrives.

The community has been working around the clock to coordinate the new chain's launch. Subject to potential change, we expect Terra to go live on May 28th, 2022 at around 06:00 AM UTC."

(Terra 🌍 Powered by LUNA 🟡 [@terra_money], 2022b)

4.2.3. Rumors and negative events

On 13 June 2022 there were significant increase in the number of mentions. This happened at the same time as negative rumors spread about Do Kwon gained a lot of fortune before the crash by cashing out \$28 billion worth of LUNA (Bertillo, 2022). Also, there were other rumors that already started to spread on 21 May 2022 about Do Kwon used an unknown wallet of 20 Million LUNA to vote on the fork proposal himself (Karunanidhi, 2022). On 12 June 2022 Do Kwon published a thread on his personal Twitter account to give clarification regarding the rumors.

"1/ This should be obvious, but the claim that I cashed out \$2.7B from anything is categorically false"

(Do Kwon 🟡 [@stablekwon], 2022e)

Moreover, on 21 May 2022 Do Kwon already gave statement regarding the voting rumors, on his discussion with a community influencer @FatManTerra (Karunanidhi, 2022).

*Replying to
@FatManTerra @husseinAjy
and 3 others
Token purchase agreement holder with TFL. Besides that I decline to respond.
(Do Kwon 🟡 [@stablekwon], 2022d)*

4.2.4. Lunatics community's data interactions

This study also collected and categorized mentions from Lunatics community with Brand24 and listed several popular mentions based on the sentiment and the amount of likes and shares. Moreover, we also observed and categorized conversations data from Twitter. To make sure about ethical standard, this report shows summary of the messages without the usernames of the Twitter accounts. These are several interaction patterns among Lunatics that occurred during the crash:

- i. Using hashtag #LUNAtics as identification.
- ii. Using hashtag #LUNC, #LUNCburn, #LUNAburn, #LUNAcassic for those who still believe in the recovery of LUNA classic (LUNC) and encourage each other to burn their LUNC to increase the value of it.
- iii. Creating micro influencers accounts to give updates about the latest price movements, news, and to keep reminding Lunatics community about the burning strategy.
- iv. Using greetings or phrases for casual tweets such as "dear fellow Lunatics", "good morning", "what a great day", "good night", and "stay safe #LUNC army".
- v. Showing empathy for those who suffered a lot of loss during the crash.
- vi. Giving encouragement, with words and phrases such as "holding strong", "stay strong", "together", "big news is coming", "pumping", "bullish", "rise from the grave", "going crazy", "accumulating", "Luna \$1", "moon", "survive", "explode" and "rocket".
- vii. Organizing events to facilitate NFTs, airdrops and giveaways, especially for those who suffered a lot of loss.
- viii. Mentioning or replying Do Kwon (@stablekwon), Terra official account (@terra_money) and other public figures such as Changpeng Zhao (@cz_binance) and Elon Musk (@elonmusk) for questioning, reporting, or confirming issues regarding the crash.

Several influencers and public figures in cryptocurrency community also gave their opinion regarding the crash and the recovery plan. Changpeng Zhao (@cz_binance) who also the founder and CEO of Binance tweeted his opinion while replying some questions addressed to him regarding the fork recovery plan for Terra LUNA.

*"Reducing supply should be done via burn, not fork at an old date, and abandon everyone who tried to rescue the coin.
I don't own any LUNA or UST either. Just commenting."*

(CZ 🟠 Binance [@cz_binance], 2022)

5. Discussion

Using netnography method and monitoring tools, this study gathered, observed, categorized, and analyzed mentions based on the dates, sentiments, crisis response strategies and community interactions patterns. Collected Twitter data from Do Kwon as the co-founder and CEO of Terraform Labs and data from official account of Terra LUNA can be categorized into several crisis response strategies in accordance with the social media crisis communication strategies discussed by Triantafillidou & Yannas (2020). Also, some of the mentions contained rumor clarification, as stated by Agarwal et al. (2022) that publishing rumor clarification on social media is also one of important strategies during the crisis.

5.1. Crisis Response Strategies

At the early stage of the crisis on 11 May 2022, Do Kwon tweeted a thread on his personal account @stablekwon to inform community about the current crash situation (Do Kwon 🟡 [@stablekwon], 2022a). This thread consists of several different crisis response strategies. The first was mortification, as he admitted the problems that caused the crash. The next strategy was corrective action as he clarified the current condition and informed the recovery plan for Terra UST. In addition, the strategy of reducing the offensiveness was also used by exposing positive achievements in the past such as reminding the community about the success of Terra ecosystem and how it has survived the previous setbacks a year before the crash. However, those strategies cannot neutralize the negative sentiment, as there were more negative mentions than positive mentions as shown on Table 1 and Figure 1.

Another strategy for mortification was revealed in a thread on 14 May 2022. Do Kwon showed how heartbroken he was to see the pain the community must endured (Do Kwon 🟡 [@stablekwon], 2022b). He did not deny that Terra framework as his invention has made a lot of people suffer. Also, the thread can be categorized as corrective action strategy as Do Kwon informed the community about the recovery plan. He stated that the Terra UST has failed and will not become a part of the next recovery plan. The following days, specifically on 16 May 2022 there were an increase in the number of positive mentions and a decrease in the number of negative mentions as shown in Table 1 and Figure 1. In contrast with what Triantafillidou & Yannas (2020) found, corrective action strategy itself was not proved to be the most effective strategy in generating positive engagements in the community. This study found that corrective action should be combined with mortification to stimulate more positive mentions in the community. This finding was in line with the statement by Oltra González, Camarero, & San José Cabezudo (2021) about the importance of showing empathy towards the community affected by the crisis as it could make them feel optimistic towards the company.

There were significant number of positive mentions on 22 May 2022 as shown on Table 1, Figure 1, and Figure 2. Moreover, the mentions data collected with "Lunatics" as the filter keyword show a spiking rise of positive mentions more than double the number of negative mentions. On that day, Do Kwon replied to a lot of tweets from the community that addressed to him. The replies were consisted of several crisis response strategies, including mortification, corrective actions, and rumor clarifications. In addition, on 19 May 2022 Terra LUNA official account also retweeted Do Kwon's announcement about proposal voting regarding several recovery plans that could be categorized as corrective action strategy. However, regardless the significant increase in the number of positive mentions, the analyzed data showed that the positive mentions from Lunatics community mostly contained messages that indicating disapproval of the proposal. Thus, the positive sentiment did not show their confident in Do Kwon's recovery plan which was the network forking. Most of the Lunatics were encouraging each other to keep on burning LUNA as they believed it was the right solution for recovery.

Even though the combination of mortification and corrective actions has generated positive mentions, the messages conveyed were not in line with the recovery plan as Lunatics has their own ways to survive. These findings were in line with previous studies by Xie, Pinto, & Zhong (2022) about community resilience during crisis events. They stated that social media engagement that involves interacting and supporting each other were very important to strengthen community resilience during a crisis, so they can survive and overcome the crisis together (Xie et al., 2022). This discovery also indicates that the community has significant influence to move market sentiment, regardless the crisis responses strategies that have been done by the responsible party.

The new LUNA as the result of Terra blockchain forking has been launch on 28 May 2022 and the announcement already published several days before as part of corrective action strategies. Besides the rebirth of LUNA, existing old LUNA holders also received new LUNA airdrops as part of the compensation, and this could be categorized as reduce offensiveness strategy. However, these strategies could not neutralize the sentiment, as there were more negative mentions than positive mentions on the launch day. Several top negative mentions on that day conveyed messages that rejected the new LUNA and keep reminding the community to burn LUNC (LUNA Classic or old LUNA). The Lunatics already lose their faith in Terra blockchain and even some of them are planning to sell the new LUNA as soon as they get the airdrops.

The increase of negative sentiment within Lunatics community was in line with the previous study by Wang, Schuetz, & Cai (2021) on crisis response strategies on social media. They found that crisis response strategies could result in various reactions from targeted community and one of the reactions that could be appeared was accusing the company and spreading negative information (Wang et al., 2021). While the community was against the company and more negative sentiment spread, the company should initiate more discussions with the community to open possibilities for other solutions (Wang et al., 2021). Unfortunately, even though community and investors have participated in the proposal vote, the vote results were not as expected by Lunatics community. This can be seen as more mentions from Lunatics were supporting burning solution not network forking. In results, there were even more negative sentiment and rumors spreading within the community. Therefore, as stated by Wang, Schuetz, & Cai (2021) public opinion monitoring is essential in the middle of a crisis so the company could give the right response, especially when the negative mentions were more dominant than positive ones. Also, as suggested by Zhao & Chen (2022), it is important to have a good communication management that gives mutual benefits for both the company and its community. A company should have a community management team to maintain mutual relationship with the community, because as stated by Zhao & Chen (2022) a highly engaged reciprocal communication within virtual community could result in brand loyalty.

5.2. Rumor Clarification

Do Kwon also published several clarifications regarding rumors that spread in the community about how he gained profits before the crash and how he used a mysterious LUNA wallet to win the proposal voting. The first clarification was tweeted on 21 May 2022, and it can be categorized as denial as part of the crisis response strategies. The second clarification was published on 12 June 2022, and it also can be categorized as denial as he refused to answer questions from a community influencer @FatManTerra regarding the rumor. The next day on 13 June 2022 the rumors became trending among the community as @FatManTerra tweeted

the screenshot of his conversation with Do Kwon on 21 May 2022 when he denied the rumor (Karunanidhi, 2022). On that day the number of negative mentions increased more than twice the number of positive mentions. Thus, the denial strategy was failed to neutralize the negative sentiment. These findings also consistent with the study from Jain (2022) that emphasized on the importance of opinion leaders to control rumors in social media during a crisis. Therefore, instead of denying or refusing to answer, it is important for Do Kwon as the community leader to clarify any rumors that spread on social media.

Another cause of negative sentiment among the Lunatics community was the collapse of Celsius Network and how LUNA crash event was mentioned to be somehow related with the fall of that leading cryptocurrency investment company (Morris, 2022). In this case, Do Kwon and Terra LUNA official account did not mention anything about Celsius Network. Instead on one of his tweets, Do Kwon reminded the community about how cryptocurrency works as decentralized system and how to survive in this industry (Do Kwon 🟡 [@stablekwon], 2022f). This could be categorized as reduce the offensiveness strategy, as Do Kwon reminding the community about the advantages of cryptocurrency system. Instead of responding to the rumors, Do Kwon has acted as an influential public figure that encouraging the community to keep their confident in cryptocurrency, as the fall of Terra LUNA and Celsius Network has become a crisis of cryptocurrency industrial.

5.3. Community Interactions

The interaction patterns found within Lunatics community also support findings by previous studies about virtual community interactions by Lizzo & Liechty (2020). The Lunatics community has its own hashtags to identify themselves and to increase their senses of belonging. They also have their own ways to support each other in the middle of the crisis, by simply replying, retweeting, and mentioning each other to show their unity as Lunatics community. On 26 June 2022, the power of community has moved the market sentiment and there were more positive than negative mentions that mainly consisted of how the Lunatics still believe in the recovery of LUNA Classic (LUNC). They kept encouraging each other to burn their LUNC to increase the value of it. Therefore, as stated by Oltra González et al. (2021) it is important for company or organization to always maintain good relationship and emotional bonding with its community. Therefore, when the crisis happened the community will keep supporting the recovery process (Oltra González et al., 2021).

In this LUNA crash incident, the community members have more trust in those influential public figures than in Do Kwon as the founder and CEO of Terra Blockchain. They kept believing what influencers and public figures said that burning was the right solution instead of the network forking solution as the official recovery plan. These findings were in line with the study by Tjahyana (2021) on cryptocurrency virtual community, as the role of influencers was very important for community to make decisions especially regarding the future of their investment. Also, as suggested by Zhao & Chen (2022) a company's community management team should give special privileges to those highly engaged community members such as influencers within the community, so they will support and stay loyal to the company.

Finally, future studies should include the price movement as part of indicators to measure the success of crisis response strategies in the cryptocurrency communities. Also, future research could try to observe more private communities such as channels, servers and groups in Telegram, Discord, and WhatsApp.

6. Conclusions

This study has found that the right crisis response strategies are needed in the time of crisis as each strategy could stimulate several different types of community sentiment. Mortification and corrective action were proven to be the right strategies that should be carried out at the same time to stimulate more positive sentiment in the community. When rumors spread during a crisis, instead of denying the rumors company should clarify the situation to prevent more negative sentiment from spreading in the community. Communities have significant influence in generating positive or negative sentiment on social media during crisis events. Therefore, it is very important to always maintain strong relationship with the community so when a crisis happened, they will fully support the recovery process and stay loyal to the company. Moreover, company should spare time and budget to have great mutual relationship with the community, such as organizing events, giveaways, and meetups. It is very important to maintain good relationship with influencers and public figures in cryptocurrency communities, as they have important roles in driving community sentiment during. In addition, it is crucial to always monitor social media sentiment as an indicator to measure the success of crisis response strategies. Finally, a company should have a dedicated community management team to maintain a strong relationship with the virtual community and to monitor community sentiment before, during and after a crisis occurs.

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Do Kwon 🍌 [@stablekwon]. (2022b, May 13). 1/ I've spent the last few days on the phone calling Terra community members – builders, community members, employees, friends and family, that have been devastated by UST depegging. I am heartbroken about the pain my invention has brought on all of you. [Tweet]. Retrieved August 10, 2022, from Twitter website: <https://twitter.com/stablekwon/status/1525238416991891457>

Do Kwon 🍌 [@stablekwon]. (2022c, May 21). @AMoneyfest @FatManTerra @cryptothespian @jackdx16 @Sarahparker45 @gregosuri My priority is not about what happens to me, but making sure the Terra community has a place to build and years of their work does not go to waste I dont care what happens to me as long as that happens [Tweet]. Retrieved August 10, 2022, from Twitter website: <https://twitter.com/stablekwon/status/1528002860603932672>

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Table 1. Positive and Negative Sentiment Data

No.	Date	Positive mentions	Negative mentions
1	11 May 2022	626	1.207
2	16 May 2022	671	525
3	22 May 2022	1.076	469
4	28 May 2022	363	537
5	13 June 2022	511	1.235
6	15 June 2022	424	963
7	18 June 2022	585	972
8	22 June 2022	441	618
9	26 June 2022	613	396

Source : Brand24

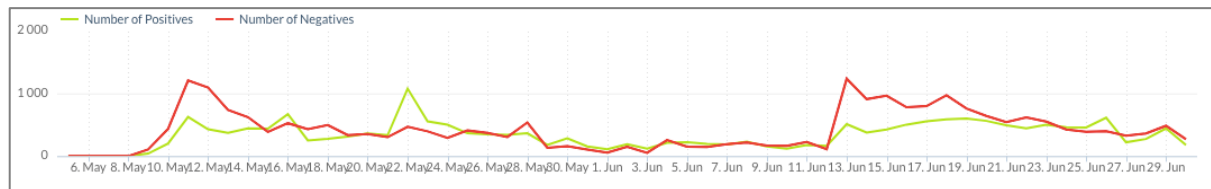


Figure 1. General sentiment chart for keyword "Luna"

Source : Brand24

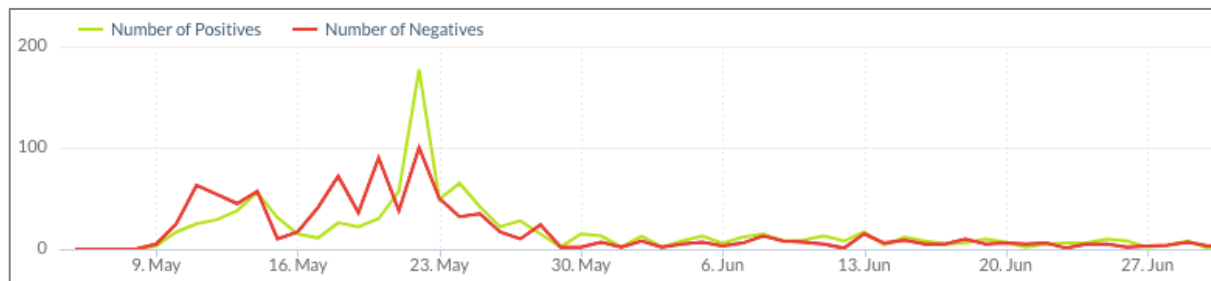


Figure 2. Community sentiment chart for filter keyword "Lunatics"

Source : Brand24

5. Bukti konfirmasi artikel "Accepted"
(1 November 2022)

[ijbs] Editor Decision

1 message

IJBS Editor-in-Chief <ijbs@petra.ac.id>

1 November 2022 at 15:16

To: Lady Joanne Tjahyana <joanne@petra.ac.id>

Lady Joanne Tjahyana:

We have reached a decision regarding your submission to Petra International Journal of Business Studies, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community".

Our decision is to: Accept Submission

[Petra International Journal of Business Studies](#)

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6. Bukti artikel di kirim ke proses "Production"
(15 Desember 2022)

[ijbs] Editor Decision

1 message

admin admin <ijbs@petra.ac.id>

15 December 2022 at 07:52

To: Lady Joanne Tjahyana <joanne@petra.ac.id>

Lady Joanne Tjahyana:

The editing of your submission, "Crisis Response Strategies During Cryptocurrency Crash: A Netnographic Studies of Lunatics Community," is complete. We are now sending it to production.

Submission URL: <https://ijbs.petra.ac.id/index.php/ijbs/authorDashboard/submission/241>

7. Bukti konfirmasi artikel "Published"
(15 Desember 2022)

[ijbs] New notification from Petra International Journal of Business Studies

1 message

admin admin <ijbs@petra.ac.id>

15 December 2022 at 09:35

Reply-To: "Dr. Ir. Hotlan Siagian, M.Sc." <hotlan.siagian@petra.ac.id>

To: Lady Joanne Tjahyana <joanne@petra.ac.id>

You have a new notification from Petra International Journal of Business Studies:

An issue has been published.

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Dr. Ir. Hotlan Siagian, M.Sc.

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