

Article

Communication Strategies of Startups During the Natural Catastrophe of the 2024 DANA: Impact on Public Opinion and Business Reputation

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Abstract

In October 2024, a DANA (Isolated Depression at High Levels) triggered torrential rains across the Valencian Community, causing 227 deaths, severe infrastructure damage, and economic losses estimated at €17.8 billion. In this context of crisis, startups, despite having fewer resources and less experience than large corporations, played a significant role in crisis communication, shaping public perception and operational continuity. This study explores the communication strategies adopted by startups during and after the disaster, focusing on their activity on Instagram, TikTok, and Facebook between October 2024 and January 2025. Using a mixed-methods approach, we conducted a quantitative analysis of digital discourse through the Fanpage Karma tool, assessing metrics such as engagement, reach, and posting frequency. Sentiment analysis was performed using GPT-4, an advanced natural language processing model, and in-depth interviews with startup representatives provided qualitative insights into reputational impacts. The findings reveal that startups which aligned their discourse with the social context, prioritizing transparency and emotional proximity, enhanced their visibility and credibility. These results underscore how effective crisis communication not only mitigates reputational risk but also strengthens the local entrepreneurial ecosystem through trust-building and social responsibility.

Keywords: crisis communication; organisational resilience; startup; start-up; reputation; social media; Valencia



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1. Introduction

In October 2024, the Valencian Community was struck by a natural disaster: DANA, which unleashed intense rainfall and flooding. More than 70 municipalities in the region, particularly in the areas of l'Horta Sud and La Ribera, experienced severe losses, including the lives of hundreds of citizens, extensive material damage, and a significant impact on infrastructure and economic activity (De Lucas Martín, 2024). According to the report presented by the Second Vice President of the Consell, the floods affected a total of 306,000 people, injured 2641 and resulted in 227 fatalities (Clemente, 2025), based on the latest judicial data. Furthermore, the economic damage amounts to €17.8 billion, distributed

across infrastructure, businesses, the environment, and social sectors, making this disaster one of the costliest in recent European history (Fedriani, 2025; San José, 2025).

This extreme event tested the response capacity not only of public authorities, corporations, and organised volunteer groups, but also of the affected citizens and emerging companies operating in Valencia. In the case of startups, whose market presence is still emerging compared to consolidated entities, the effects of the DANA were felt particularly acutely. Nonetheless, despite structural and resource limitations, these ventures demonstrated notable adaptability and innovation in the face of crisis. Although the social impact of natural phenomena such as the DANA is difficult to avoid, the strategic use of technology and entrepreneurial creativity were key factors in mitigating its consequences.

In this regard, various initiatives led by entrepreneurs emerged, some previously established, others developed in response to the meteorological event, rapidly yet effectively. Organisations such as “Startup Valencia”, the “Marina Empresas” hub, and “South Summit” mobilised the entrepreneurial ecosystem to promote solutions aimed at reducing the disaster’s impact (Delgado, 2024). One of the most notable initiatives was the fundraising of €200,000 by Startup Valencia to support those affected by the DANA. This action was made possible through a series of strategies coordinated under the leadership of its president in collaboration with the NGO “Admundi” (Pérez, 2024). Beyond organisational effort, risk communication management played a key role: Startup Valencia used social media and digital platforms to ensure the public was informed about the existence, purpose and distribution criteria of the raised funds, thereby fostering trust, transparency, and public engagement. This communicative dimension aligns with the principles of strategic communication in crisis contexts, where planning information flows and building trust with stakeholders are essential for reinforcing institutional image and minimising reputational damage (Enrique Jiménez, 2008; Zurro-Antón et al., 2021).

Within this context, communication management became a critical element for business stability. Valencian companies facing the crisis adapted their communication strategies to preserve stakeholder trust. Social media played a central role in enabling swift responses, increasing the visibility of actions taken, and strengthening ties with affected communities. Moreover, it helped reduce uncertainty and reinforce institutional legitimacy during a period of intense tension (Lozano-Recalde, 2024).

This study aims to analyse how Valencian startups, as well as those located in surrounding areas, utilised digital communication during the 2024 DANA to manage their reputations and strengthen their strategic market positioning. By adopting a methodological approach that combines social media discourse analysis with in-depth interviews, the research seeks to identify the most effective communication strategies and their impact on startups during the crisis.

To this end, the study poses the following research questions:

1. What communication strategies did Valencian startups implement on social media to manage their reputations during and after the 2024 DANA crisis?
2. How did organisational resilience and public relations management influence startups’ ability to cope with the crisis and maintain operational continuity?

This analysis will not only enhance our understanding of the communicative dynamics adopted in a crisis context but also provide valuable insights into the importance of strategic communication for the resilience and sustainability of startups and future enterprises in adverse scenarios.

2. Theoretical Framework

2.1. Crisis Communication and Its Impact on Corporate Reputation

Although the concepts of risk and crisis are often used interchangeably, it is essential to distinguish between them, as they are closely related but not equivalent. Risk refers to a future possibility of harm, associated with uncertainty and the likelihood of a negative event occurring (Aven & Renn, 2009). A crisis, on the other hand, represents a situation that has already materialised, is highly severe, disrupts the normal functioning of an organisation, and demands an immediate response (Coombs, 2023). This study addresses both phenomena: communicative risk, as part of preventive management, and the crisis triggered by the DANA, which required specific communication strategies from startups.

Strategic communication has become essential in times of uncertainty, helping to mitigate negative outcomes and even turn challenging environments into opportunities for increased corporate visibility (Nuortimo et al., 2024). Corporate reputation is a key intangible asset that influences public perception and stakeholder trust, particularly in critical situations (Mizrak, 2024).

Crises rarely arise in isolation; they are often the result of a combination of interacting factors, including unmanaged, ignored, or unforeseen risks (Coombs, 2023). Risk is defined as “the uncertainty about the severity of the consequences (or outcomes) of an activity concerning something that humans value” (Aven & Renn, 2009, p. 5). This definition moves beyond probabilistic conceptions and offers a more integrative view of risk, taking into account both uncertainty and human values. From this perspective, risk management, understood as the set of processes aimed at identifying, analysing, and responding to potential risks before they evolve into crises, becomes a key element in organisations’ communication strategies (Lerbinger, 2012; Renn, 2017; Reynolds & W. Seeger, 2005). Communicating risk, therefore, is not merely about informing; it involves anticipating, building trust, and reducing vulnerabilities.

Public relations strategies play a crucial role in crisis management, as they significantly affect media coverage, public perception, and organisational resilience. However, their effectiveness varies depending on the sector and context in which they are applied, such as in healthcare, technology, or retail (Isaac, 2024). In the context of the COVID-19 pandemic, Xu (2024) examined how public relations served as a key mechanism to address a broad spectrum of public issues, from enhancing organisational image to managing international conflict, highlighting the importance of strategic communication in global crises and its influence on public perception. The perceived risk during the pandemic, for example, demonstrated the need for clear and effective communication to foster audience trust and minimise uncertainty (De Las Heras-Pedrosa et al., 2020).

Social media have reshaped the paradigm of crisis communication by enabling real-time interaction with audiences and increasing the ability to control corporate narratives (Veil et al., 2011). Previous studies highlight that the tone and content of messages can elicit different emotional responses in audiences, directly influencing a company’s reputation (Schultz et al., 2011; Utz et al., 2013). In this regard, the situational crisis communication theory (SCCT) suggests that communication strategies should be adapted to the severity of the event and the level of responsibility attributed to the company (Liu et al., 2011). In addition to SCCT, other theoretical perspectives can help frame the communicative dynamics observed during crisis scenarios. Media Richness Theory offers insights into the effectiveness of emotionally charged and visually rich platforms, such as Instagram and Facebook, when immediacy and contextual clarity are required (Liu et al., 2016). Uses and Gratifications Theory contributes to understanding why certain types of content resonate more strongly with audiences in times of uncertainty, based on users’ active search for emotional connection, information, or reassurance (Hossain, 2019). From a strategic stand-

point, Stakeholder Theory provides a relevant framework for analysing how startups adapt their messaging to address the expectations of different audiences, especially in contexts of reputational vulnerability (Gossel, 2022).

Appropriate communication management not only helps to mitigate the effects of a crisis but also strengthens relationships with stakeholders by addressing their perceptions and preparing responses that contribute to a positive organisational image (Romero-Rodríguez et al., 2017). Transparency, empathy, and consistency in messaging are essential elements for transmitting credibility and generating trust among audiences (Lucas & Mitra, 2024). In the case of the 2024 DANA in the Valencian Community, the crisis communication adopted by various startups appears to have helped maintain the trust of their clients and stakeholders. As noted by Romero-Rodríguez et al. (2017), effective communication management in critical situations not only reduces negative impacts but also reinforces the relationship with strategic publics.

2.2. Resilience, Innovation, and Digital Communication in Startups During a Crisis

The resilience and innovation demonstrated by startups during crises depend not only on their internal capabilities but also on their ability to effectively communicate their actions and adaptations to the external environment. In this context, social media emerge as key communication channels, enabling direct interaction with stakeholders, rapid dissemination of innovative initiatives, and the building of trust in times of uncertainty (Luik, 2023; Splendiani & Capriello, 2022).

Startups, by virtue of their emergent nature and lack of consolidated business models, are particularly vulnerable in times of crisis (Bărbulescu et al., 2021). However, this very condition affords them flexibility, enabling them to swiftly adapt to adverse scenarios and identify opportunities for innovation amid uncertainty (Foris et al., 2022).

Organisational resilience is defined as the ability of a company to absorb shocks, learn from adversity, and transform its operations to ensure continuity (Lucas & Mitra, 2024). Startups are, by nature, young companies with strong technological foundations, characterised by organisational flexibility and the ability to rapidly adjust to new market environments through innovative strategies (Bărbulescu et al., 2021; Foris et al., 2022). As such, they can confront economic crises and natural disasters through adaptive strategies and the use of new technologies. According to Williams et al. (2017), organisational leadership plays a key role in this process, as the ability of entrepreneurs to make rapid and innovative decisions determines the success of the business during times of crisis.

The impact of natural disasters on the entrepreneurial ecosystem has been addressed in various studies. According to Demirdag and Nirwansyah (2024), crises may disrupt business operations and critical infrastructure, but they also generate new business opportunities. Monllor and Murphy (2017) reinforce this idea, noting that disasters can lower entry barriers and stimulate the creation of startups aimed at addressing emerging needs.

In this context, innovation becomes a crucial factor for the survival of startups. The ability to develop new business models, explore alternative markets, and adopt digital technologies can be decisive in determining whether a business continues or fails (Martinelli et al., 2018). Huang et al. (2024), highlight that the use of digital platforms has enabled many startups to remain competitive in crisis scenarios, optimise operations, and strengthen their relationships with consumers. Moreover, collaboration with governmental and third-sector organisations can facilitate business recovery by providing access to funding and strategic resources (Homayounfar et al., 2025).

Social media have revolutionised the way companies manage crises, offering a direct channel of communication with audiences and enabling swift responses to emergency situations (Liu et al., 2011). In addition to serving as key tools in crisis communication, social

media play a fundamental role in reputational risk management. In a highly volatile digital environment, companies must constantly monitor risks associated with public perception and adapt their communication strategies to mitigate the impact of fake news, misinformation, or unexpected media crises (Allianz Global Corporate & Specialty [AGCS], 2021).

Previous studies have shown that messages with a positive and inspiring tone can significantly influence public perception and a company's recovery capacity during crises (Luik, 2023). Furthermore, Splendiani and Capriello (2022), emphasise that the strategic use of social media facilitates the immediate dissemination of information and strengthens audience relationships, enabling companies to align their discourse with the social context and increase their visibility and proximity to the public.

3. Materials and Methods

This study adopts a mixed-methods approach (Krippendorff, 2019), combining qualitative and quantitative techniques to analyse the communication strategies used by startups during the crisis caused by the 2024 DANA. To this end, the research was designed around the analysis of social media discourse, complemented by in-depth interviews. This combination allows not only the identification of communicative patterns but also an understanding of public perceptions regarding these strategies. This methodology has proven effective in identifying discursive trends during crises, as supported by recent studies in the field of digital communication applied to entrepreneurship (Kaiser & Kuckertz, 2023).

The study sample was selected from journalistic and entrepreneurship-focused sources, such as the initiative published by Startup Valencia (2024), regarding the ecosystem after the DANA, Delgado's report (2024) highlights the role of local entrepreneurship during the emergency, and the directory of emerging startups compiled by Seedtable (2024).

All selected entities met the criterion of having active social media accounts on Instagram, TikTok and/or Facebook during the period from 28 October 2024 to 31 January 2025. This time frame was chosen as it encompassed the peak of the DANA's social and media impact. The selection of these three platforms was based on their high penetration among digital audiences, their emphasis on visual content, and their capacity to foster emotional engagement and communication in crisis scenarios (Luik, 2023; Splendiani & Capriello, 2022). Although platforms such as LinkedIn may be relevant in corporate contexts, recent studies suggest that in emergencies, startups tend to prioritise channels that enable direct and empathetic interaction with the community (Kaiser & Kuckertz, 2023).

Research Phases

- Social media content analysis

Data collection on social media was conducted using the "Fanpage Karma" tool (uphill GmbH, Berlin, Germany), previously employed in academic research to evaluate key indicators such as posting frequency, audience engagement, and the effectiveness of various content formats (Lozano-Blasco et al., 2021; Rando Cueto et al., 2024; Rodríguez-Vera et al., 2024). This tool enables the extraction of detailed information regarding startup activity on digital platforms and supports the identification of trends in corporate discourse management during crises. Data extraction was carried out on 11 March 2025, providing a fixed reference point to ensure consistency in observing metrics that can vary daily.

- Sentiment analysis

To examine the prevailing sentiments in the most impactful social media posts, the GPT-4 language model was used, which specialises in natural language processing. This tool has demonstrated high accuracy in emotional text classification, achieving up to 95% accuracy in recent studies (Krugmann & Hartmann, 2024; Michailidis, 2024).

Language models such as GPT-4 are increasingly recognised as innovative tools in fields like marketing and social research, as they enable the efficient processing of large volumes of unstructured data (Biró et al., 2023; Ghatora et al., 2024).

In this study, approximately 60 high-engagement posts were analysed across Instagram, TikTok, and Facebook, covering two key periods: the critical phase of the DANA (28 October to 15 November 2024) and the extended phase through January 2025. Content analysis included emojis, hashtags, and informal expressions, while visual elements were also incorporated to provide greater contextualisation for the model.

The sentiment analysis followed a three-step process:

1. Original data collection.
2. Automated analysis using the standard prompt: “What is the sentiment of this text? (Positive, Negative or Neutral)” (Ghatora et al., 2024), with a short justification generated.
3. Manual validation of the outputs to ensure coherence and reliability of classifications.

The manual validation process was conducted by researchers with expertise in digital communication and qualitative analysis. A total of 100% of the GPT-4 sentiment classifications were reviewed manually to ensure consistency with the context of each post and the overall tone. While no inter-coder reliability test was formally applied due to the exploratory nature of this study, the high level of agreement observed between reviewers reinforces the reliability of the sentiment analysis.

This approach enabled a systematic and ethical evaluation of digital discourse during the crisis, revealing emotional patterns relevant to the study of strategic communication in adverse contexts.

A total of 60 high-engagement posts were selected for the sentiment analysis. These included the top 10 posts from each platform: Instagram, TikTok, and Facebook, during two distinct timeframes: the critical period (28 October to 15 November 2024) and the extended period (16 November 2024 to 31 January 2025). This approach ensured a balanced representation of emotionally relevant and high-impact content for each stage of the crisis, resulting in 30 posts per period. Selection was based on engagement metrics provided by the Fanpage Karma tool, including reactions, comments, shares, and overall interaction levels.

To complement the social media discourse analysis, in-depth interviews were conducted with representatives of Valencian startups (Table A1). These interviews were carried out with explicit informed consent, adhering to the ethical principles of qualitative research throughout the process. This technique was chosen for its capacity to capture shared perceptions and beliefs about crisis communication management, in line with prior research using this methodology in organisational studies (Krueger & Casey, 2009). The interviews explored key aspects such as crisis management and the impact of communication on corporate reputation.

The responses were gathered through an open-ended online questionnaire designed to encourage narrative expression, rather than binary or closed answers. The participating startups represented diverse sectors, including mobility, healthtech, and digital services, and were characterised as micro-enterprises with fewer than 50 employees. Recruitment was carried out via purposive sampling, through direct invitations sent via email to startups that had shown active social media presence during the DANA crisis. Although the sample size is modest, the depth and thematic consistency of the responses support the exploratory nature and interpretive aims of this study.

The combination of these methods offers a comprehensive approach to examining the effectiveness of the communication strategies adopted by startups in a crisis context. Through discourse analysis, quantitative evaluation of social media engagement, and qualitative insights from in-depth interviews, this study provides a detailed view of the role

of digital communication in managing corporate reputation and organisational resilience during adverse situations.

4. Results

4.1. Outcome of Social Media Strategies

4.1.1. Quantitative Analysis of Social Media

The analysis of the digital presence of Valencian startups during the 2024 DANA crisis allows us to identify key patterns in the dissemination of content and reach on different platforms. Three main social networks have been evaluated: Instagram, TikTok and Facebook, to understand the impact of each one in the communication of the emergency and the strategies adopted by the startups to interact with their audiences.

- Top 10 accounts with the most followers.

As shown in Figure 1, on Instagram, “GrowPro” tops the list with close to 600,000 followers, consolidating its position as the startup with the largest reach on this platform. Its focus on international experiences suggests that its community was previously established before the crisis. “Bit2Me” came in second with 63,684 followers.

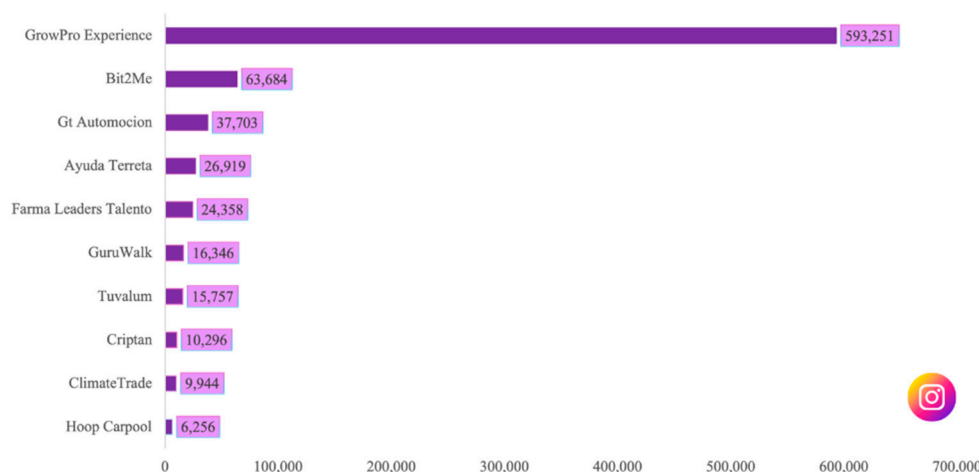


Figure 1. Instagram followers. Source: Fanpage Karma. Own elaboration.

Other relevant startups include “Gt Automoción” (37,703 followers), with activity in the automotive sector on this social network, and “Ayuda Terreta” (26,919 followers) along with “Farma Líderes Talento” (24,358 followers), which reflect a strong presence of initiatives related to humanitarian aid and the health sector.

In the case of TikTok, the distribution of followers presents a different pattern, as shown in Figure 2. “Bit2Me” was the most followed account, with 153,500 followers, indicating its capacity for engagement on a platform that is not traditionally associated with finance. It is followed by: “GrowPro” and “Gt Automoción”, with 76,500 and 48,600 followers, respectively.

The presence of startups such as “GuruWalk” (18,800 followers) and “Worksible” (8884 followers) suggests an interest in content related to travel experiences and digital employment, while “Criptan”, which specialises in the cryptocurrency sector, with only 305 followers, occupies the last place in the ranking.

On Facebook (Figure 3), the picture was different to that observed on Instagram and TikTok. “Gt Automoción” led with 1,370,569 followers, establishing itself as the most influential account on this network.

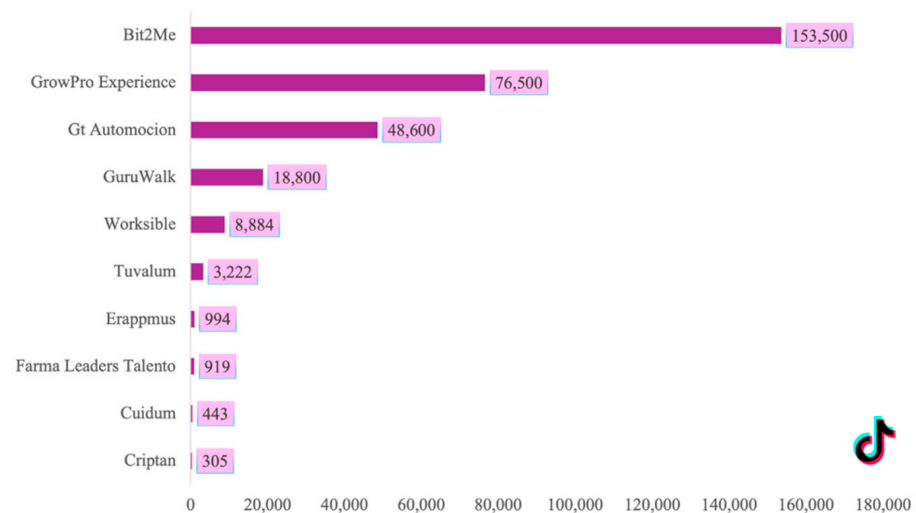


Figure 2. TikTok followers. Source: Fanpage Karma. Own elaboration.

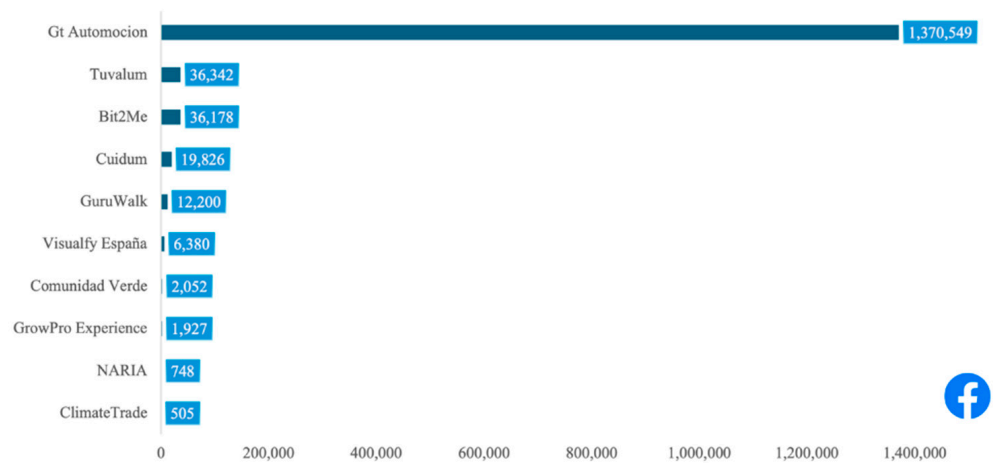


Figure 3. Facebook followers. Source: Fanpage Karma. Own elaboration.

- Analysis of main metrics

The analysis of specific variables on Instagram (Table 1) shows that “Cuidum” obtained the highest engagement, reaching 5.02%, which shows its capacity to generate interaction despite not being the account with the most followers. “Solidaridad Sobre Ruedas” (Solidarity on Wheels) was the startup with the highest number of publications, with 65 posts, indicating a strategy based on constant updating. In terms of total interactions, “Ayuda Terreta” (Help Terreta) stood out with 49,805 reactions, comments and shares, demonstrating a high level of audience participation during the period studied.

On TikTok (Table 2), “GuruWalk” achieved the best performance in terms of virality and engagement, while “GrowPro”, with 88 posts, was the most active startup on the platform. However, this strategy did not translate into proportionally high engagement. ‘Erappmus, on the other hand, generated many comments and interactions, indicating that its content was highly attractive to the audience.

Table 1. Top metrics—Instagram. **Source:** Fanpage Karma. Own elaboration.

	Engagement	Number of Posts	Highest Commented Content	Top Interactions
1	Cuidum (5.02%)	Solidaridad Sobre Ruedas (65)	Farma Leaders Talento (13,089)	Ayuda Terreta (49,805)
2	Hoop Carpool (0.45%)	BIT2ME (62)	Solidaridad Sobre Ruedas (1037)	Solidaridad Sobre Ruedas (31,266)
3	GuruWalk (0.43%)	GrowPro (51)	Ayuda Terreta (971)	Farma Leaders Talento (18,037)
4	Worksible (0.3%)	Hoop Carpool (41)	BIT2ME (227)	GrowPro (13,683)
5	Tuvalum (0.09%)	Farma Leaders Talento (40)	Hoop Carpool (177)	Cuidum (9396)

Table 2. Top metrics—TikTok. **Source:** Fanpage Karma. Own elaboration.

	Engagement	Number of Posts	Highest Commented Content	Top Interactions
1	GuruWalk (1.72%)	GrowPro (88)	GuruWalk (1438)	GuruWalk (26,814)
2	GrowPro (0.06%)	GuruWalk (35)	Erappmus (561)	Erappmus (9140)
3		Cuidum (33)	GT Automoción (971)	GrowPro (3833)
4		Farma Leaders Talento (31)	Cuidum (91)	GT Automoción (3121)
5		Hoop Carpool (15)	Hoop Carpool (15)	Cuidum (2148)

In the case of Facebook (Table 3), “Gt Automoción” was consolidated as the startup with the greatest impact, not only for its number of followers, but also for the number of publications, reaching 270 posts and generating a highly participative community. In contrast, other startups adopted less intensive Facebook strategies, reflecting differences in their digital communication approaches.

Table 3. Top metrics—Facebook. **Source:** Fanpage Karma. Own elaboration.

	Engagement	Number of Posts	Highest Commented Content	Top Interactions
1	GT Automoción (2.5%)	GT Automoción (270)	GT Automoción (207,431)	GT Automoción (3,195,803)
2	Cuidum (0.03%)	BIT2ME (90)	BIT2ME (198)	BIT2ME (864)
3	BIT2ME (0.02%)	Cuidum (66)	Cuidum (52)	Cuidum (634)
4		Tuvalum (33)	Tuvalum (7)	Tuvalum (95)
5		Visualfy (12)	GuruWalk (7)	NARIA (66)

4.1.2. Content Frequency

- Best days and times to post.

The temporal analysis reveals that on Instagram the most active days were Thursday, Friday and Sunday, with a peak of interaction during the evening hours, between 12:00 and 22:00 (Figure 4).

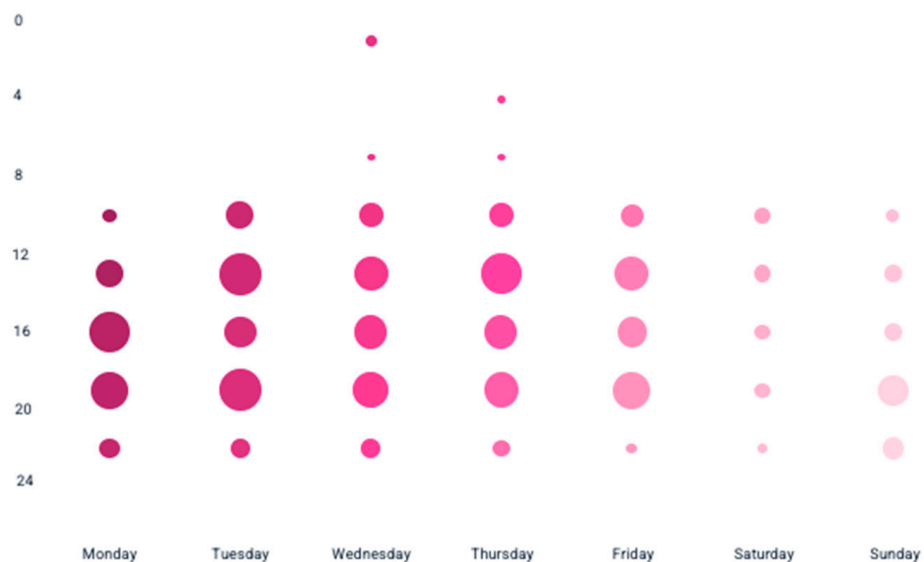


Figure 4. Frequency of posts on Instagram. Source and elaboration: Fanpage Karma.

In terms of the most used formats, videos were the most recurrent, with more than 300 posts, followed by images. Carousels, on the other hand, were less frequent, suggesting that startups preferred more direct and visually appealing content (Figure 5).

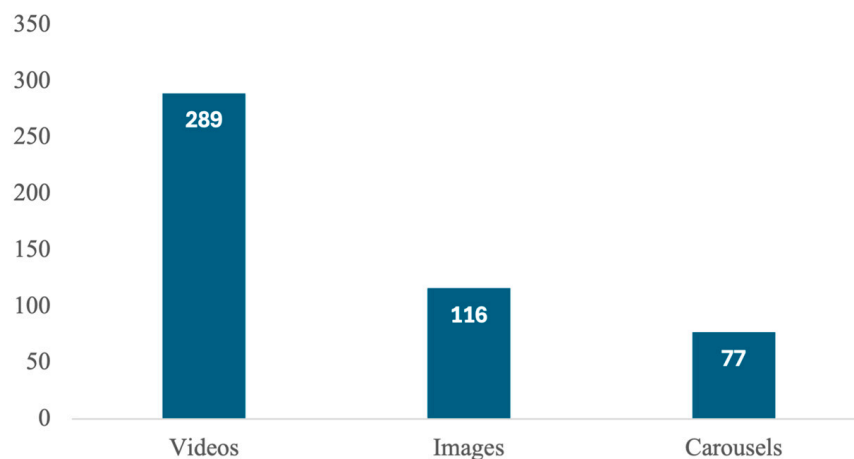


Figure 5. Types of posts on Instagram. Source: Fanpage Karma. Own elaboration.

On TikTok, the busiest days were Mondays, Tuesdays and Thursdays, with an increase in interaction between 16:00 and 20:00 (Figure 6).



Figure 6. Frequency of posts on TikTok. Source and elaboration: Fanpage Karma.

Video was the most used format, which is consistent with the nature of the platform, where dynamic and audiovisual content dominates communication strategies (Figure 7).

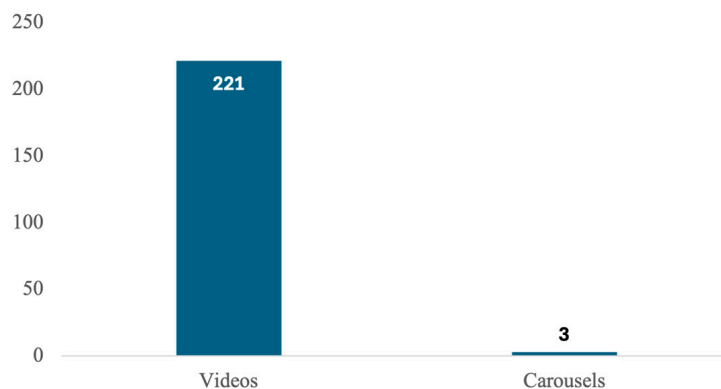


Figure 7. Types of posts on TikTok. Source: Fanpage Karma. Own elaboration.

Facebook showed a different pattern, with more activity on Thursday, Friday and the weekend, especially in the evening (Figure 8).

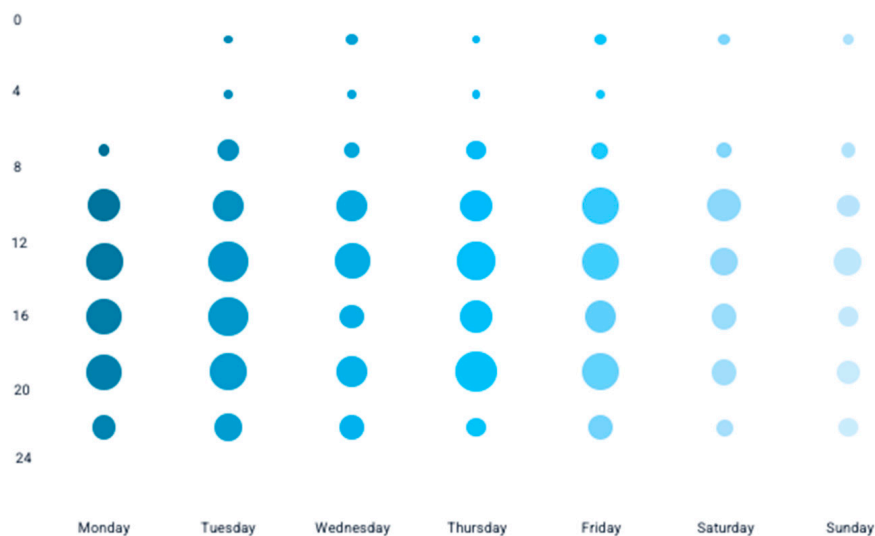


Figure 8. Frequency of posts on Facebook. Source and elaboration: Fanpage Karma.

In terms of formats, video was the most effective, while links were moderately used, and carousels were virtually non-existent (Figure 9).

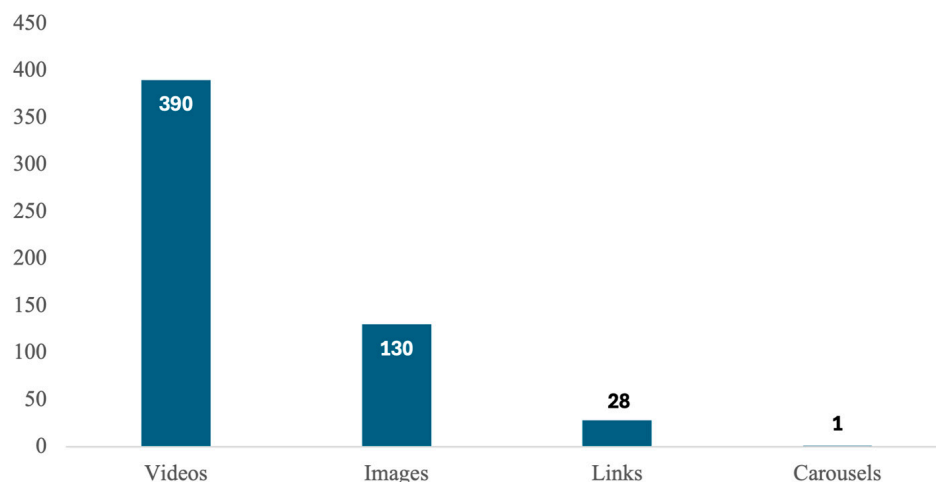


Figure 9. Types of posts on Facebook. Source: Fanpage Karma. Own elaboration.

4.1.3. Content Analysis

- Instagram

On Instagram, the most frequently used hashtags reflect a combination of humanitarian and promotional content (Table 4). Notable tags such as #DANA, #DANAValencia, and #ayudadana highlight a clear effort to raise awareness of the crisis and coordinate relief initiatives. These hashtags were widely used by startups involved in resource mobilisation and raising awareness about the impact of the disaster.

Table 4. Top 10 hashtags. Source: Fanpage Karma. Own elaboration.

Instagram	TikTok	Facebook
#abuelos	#estudiarenelextranjero	#angelgaitan
#abueloseternos	#vivirenelextranjero	#hoopcarpool
#personasmayores	#trabajarenelextranjero	#movilidadsostenible
#valencia	#australia	#valencia
#DANAValencia	#australiatiktok	#DANA
#DANA	#australiatiktok	#danavalencia
#ayudadana	#aussiethings	#adultosqueinspiran
#travel	#aussietok	#PersonasMayores
#australia	#australiatiktok	#abuelos
#growproexperience	#growproexperience	#Inclusión

There is also significant use of terms related to the protection of elderly individuals, such as #abuelos, #abueloseternos, and #personasmayores, which are directly linked to one of the startups (“Cuidum”) specialising in elderly care. However, other hashtags such as #travel, #australia, and #growproexperience also appear, which are more closely associated with travel and international experiences. The inclusion of these terms suggests that some startups continued their regular content strategy without fully adjusting their messaging to the emergency context.

- TikTok

The analysis of the most frequently used hashtags on TikTok reveals an almost complete disconnect from the DANA crisis (Table 4). Unlike Instagram and Facebook, where crisis-

related terms were considerably present, TikTok's most used hashtags focused on academic and mobility experiences abroad.

Predominant hashtags include #estudiarenelextranjero (study abroad), #vivirenelextranjero (living abroad), and #trabajarenelextranjero (working abroad), reflecting the startups' emphasis on promoting international opportunities for students and professionals. Similarly, there is a strong presence of Australia-related tags such as #australia, #aussiethings, #aussietok, and #australiatiktok, confirming that the most influential content published on TikTok during the selected three-month period was unrelated to the humanitarian crisis in Valencia.

The absence of hashtags such as #DANA or #ayudadana suggests that TikTok was not used as effectively for disseminating information about the emergency. This could be attributed to the nature of the platform, which prioritises entertaining and aspirational content over topics with higher emotional or informational weight.

- Facebook

Facebook displayed a combination of hashtags related to the DANA crisis and others focused on mobility and social awareness (Table 4). Frequently used terms such as #DANA and #danavalencia indicate that the platform was used to report on the emergency and coordinate aid efforts.

However, the regular use of hashtags such as #movilidadesostenible (sustainable mobility) and #hoopcarpool suggests that Facebook was also employed to promote alternative transport solutions within the context of the disaster.

Finally, the presence of the hashtag #angelgaitan indicates that public figures and influencers, specifically the CEO of one of the startups analysed, were involved in the conversation about the crisis. This likely contributed to the virality of certain messages and the broader dissemination of aid initiatives.

4.2. Sentiment Analysis of the Top 10 Posts According to Periods

For each platform, the ten most relevant posts were selected during two distinct timeframes: (a) an extended period (EP) of high digital activity from October 2024 to January 2025, and (b) the critical period (CP) during which the emergency unfolded, between 28 October and 15 November 2024. This dual approach enabled an analysis of the evolution of discourse and its adaptation to the crisis context.

- Instagram: emotional engagement and community narratives.

In the case of Instagram, significant differences were observed between the two periods. During the critical phase of the DANA (Table A3), most of the analysed messages conveyed a positive tone, focusing on citizen solidarity, volunteering, and mutual support. Posts that encouraged collective action, showcased progress in aid distribution, or highlighted public figures' support for initiatives, such as "Solidaridad sobre Ruedas" (Solidarity on Wheels), stood out. This emotional narrative, supported by empathetic language and symbolic emojis, successfully generated a direct connection with the affected community.

In contrast, during the extended period following the immediate crisis (Table A2), a broader range of emotions was identified. While positive messages remained dominant, more negatively charged content also emerged, particularly posts denouncing the declining visibility of the catastrophe or warning about the reduction in aid. Additionally, some posts were categorised as neutral, as they returned to traditional corporate themes or focused on commemorative dates such as Christmas. This evolution suggests a narrative shift from immediate emergency response to a gradual return to normality.

- TikTok: thematic disconnection and narrative neutrality.

TikTok was the platform that exhibited the weakest emotional connection to the crisis. In both the critical (Table A5) and extended periods (Table A4), most of the high-impact posts were classified as neutral. The predominant content focused on international experiences, student mobility, gastronomy, and tourism, with no explicit references to the DANA. This thematic disconnect reveals that the analysed startups did not adapt their content strategy on TikTok to address the emergency. The lack of integration of the event into their digital narrative may be attributed both to the nature of the platform itself and to a communication strategy that deliberately avoided altering the brand’s usual tone.

- Facebook: diversity of tone and discursive adaptation.

During the DANA crisis, Facebook featured posts with a negative tone, particularly those related to the consequences of the storm, such as vehicle loss, disruption to mobility, or uncertainty due to the lack of structural solutions (Table A7). However, positive messages were also identified, mostly associated with aid campaigns, calls for solidarity, or public expressions of gratitude.

In Facebook’s case, the sentiment analysis revealed a particularly relevant communicative insight: all high-impact posts belonged to a single startup, “Gt Automoción”. Notably, it was the CEO himself who managed the communication directly, adopting a highly personalised approach. Through posts written in the first person, narrating his involvement in aid efforts during the DANA, the executive constructed a close, emotional, and authentic narrative that generated a strong connection with the digital community (Table A6).

This type of communication, closer to a “visible leadership” model than to a classic institutional strategy, highlights how the active and direct presence of the founding team can become a key resource in times of crisis.

- Global comparison between periods and platforms.

The results show that the emotional adaptability of discourse was greater during the immediate crisis phase, particularly on Instagram and Facebook. By contrast, in the months that followed, there was a gradual return to normalised communication, with a reduction in emotionally charged content, reflecting a de-escalation in the DANA-related digital strategy. TikTok, in both the extended (EP) and critical (CP) periods, remained largely detached from the crisis narrative (Figure 10).

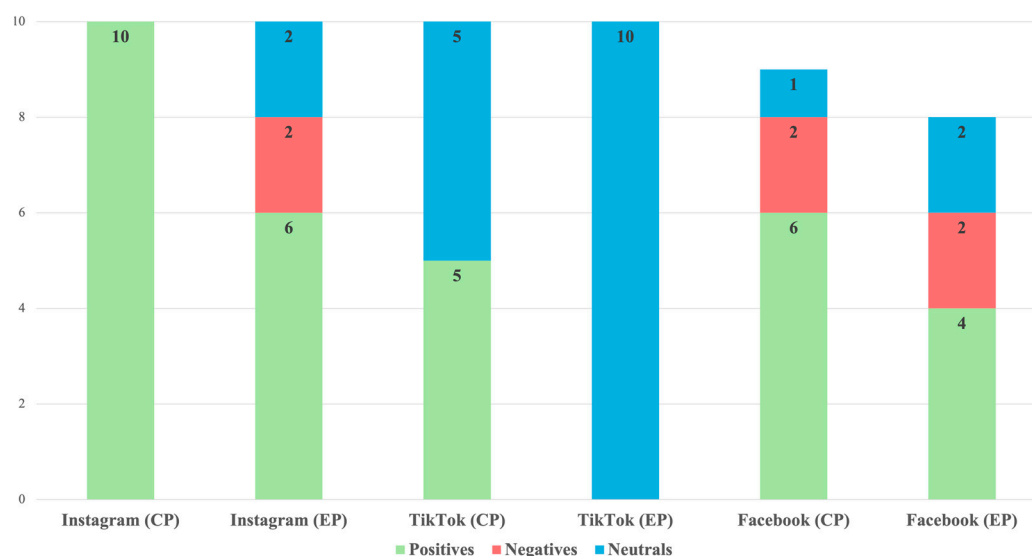


Figure 10. Sentiment analysis. Source: GPT-4. Own elaboration.

4.3. In-Depth Interview Results

To complement the quantitative and automated analysis of communication strategies, in-depth interviews were conducted using a structured questionnaire sent to various startups active on social media during the 2024 DANA. Although the response rate was limited, the testimonies collected reveal certain common trends and offer meaningful insights into crisis communication management.

Firstly, none of the surveyed startups reported having a pre-existing crisis communication plan. However, they claimed to have responded quickly and adaptively, using channels such as social media and internal messaging tools to coordinate their teams and convey information to their audiences. One participant explained, “We didn’t have a risk management plan, but from the first moment we knew we had to act quickly, especially through social media.” Another added, “Our main communication channel was WhatsApp, and that allowed us to stay agile and aligned.”

In most cases, the content disseminated was predominantly informative, with an emphasis on public service and operational transparency. One startup clarified, “We were clear that we wanted a close and human message, not just information”

Regarding reputation management, one company reported having implemented a specific public relations strategy following the DANA. Nevertheless, the startups indicated that their reputations were not negatively affected; on the contrary, in one instance, the corporate image was perceived as strengthened: “Our reputation came out stronger. People saw our human side and our ability to act fast.” It was also noted that the structural flexibility of startups can become an advantage when responding swiftly to adverse scenarios. As one respondent put it, “Not having rigid structures allowed us to adapt quickly, even though we lacked predefined protocols.”

Among the key lessons shared were the importance of maintaining active communication channels, acting promptly, and fostering an empathetic, human-centred communication approach. One participant summed it up as follows: “Empathy was the most powerful tool we had to connect—with the team, with our clients, with those affected.”

These responses reveal not only operational agility, but also a deeper cultural responsiveness to the emotional climate that surrounded the DANA. For many startups, communication became a way of expressing solidarity and reaffirming their role within a community that mourned, mobilised and sought support. This symbolic and affective dimension is essential to fully understand the resonance of the messages analysed.

5. Discussion

This research confirms that digital communication is not merely reactive in crisis scenarios, but a structural component of organisational resilience in startups. Despite their limitations, these companies managed to produce emotionally positive messages tailored to the context and disseminated through high-impact social media platforms. This strategic use of digital media aligns with [Luik \(2023\)](#) and [Lucas and Mitra \(2024\)](#) who highlight narrative agility and emotional connection with the community as key assets in uncertain environments.

The analysis reveals that startups made differentiated, strategic use of platforms based on tone, timing, and symbolic potential. Instagram stood out for constructing emotional narratives of collective support and solidarity, supporting studies on the role of emotional content in building trust ([Luik, 2023](#); [Splendiani & Capriello, 2022](#)). This reinforces the hypothesis that the most effective startups in crisis communication were those that understood not only the channel, but also the type of symbolic relationship each platform enables.

In contrast, TikTok content remained disconnected from the crisis, showing that some startups did not adapt their strategies to the evolving situation. As [Veil et al. \(2011\)](#) note, adapting narrative to context is key to exercising reputational control in volatile digital settings. Facebook, meanwhile, offered a singular example: “Gt Automoción” showed visible leadership through its CEO’s direct and emotional communication. This aligns with [Williams et al. \(2017\)](#) who argue that leadership involvement can be critical to resilience, especially in agile organisational structures.

The in-depth interview supports these conclusions. Startups acknowledged not having pre-established crisis communication plans, but emphasised their rapid response capability and the importance of the human factor in the emotional management of teams and communities. This structured improvisation, characteristic of the entrepreneurial environment, is in line with the contributions of [Foris et al. \(2022\)](#) and [Lucas and Mitra \(2024\)](#), who underscore the value of flexibility and organisational culture as pillars of business resilience.

Ultimately, the findings confirm that strategic communication, when transparent, contextualised, and empathetic, not only mitigates reputational risks, but can also strengthen brand positioning and generate lasting positive impacts. In the case of the DANA crisis, communication was a key asset for startups, contributing to both operational continuity and business consolidation.

These findings can be further interpreted through the theoretical lenses: from a Media Richness Theory perspective, the use of platforms like Instagram and Facebook reflects an intentional choice to communicate through emotionally rich and immediate formats ([Liu et al., 2016](#)). Uses and Gratifications Theory helps explain why audiences responded to content offering emotional connection and community support ([Hossain, 2019](#)). Stakeholder Theory offers a strategic framework to understand how startups tailored their messages to maintain engagement with key publics and manage reputational expectations ([Gossel, 2022](#)).

6. Conclusions

This study has enabled an analysis of the role of digital communication in crisis management by startups, using the 2024 DANA as a case study. Through social media discourse analysis, the application of artificial intelligence tools for sentiment evaluation, and in-depth interviews, the research identified the communication strategies that had the greatest impact on reputation and community engagement.

The findings indicate that those startups which adapted their narrative to the emotional context of the crisis, prioritising empathy, transparency, and public commitment, succeeded in strengthening their institutional legitimacy. Regarding the second research question, the study found that organisational resilience in startups was expressed through the ability to adapt communication strategies quickly, ensure operational continuity, and show empathetic leadership during the crisis. These traits were identified through the participants’ narratives and reflect how startups managed to maintain internal stability and public trust, despite their limited resources. Rather than relying on quantitative indicators, resilience was understood as a communicative and cultural capacity to respond constructively in adverse situations. Instagram and Facebook emerged as key platforms for constructing emotionally meaningful narratives, while TikTok represented a missed opportunity, as it failed to incorporate the critical context into its content. The absence of crisis-related content on TikTok may reflect uncertainty about how to communicate effectively on entertainment-focused platforms, or a lack of strategic alignment between communications teams and their brand tone. However, neglecting to integrate all active platforms into a unifying crisis narrative can fragment communication efforts and weaken

public perception, particularly among younger audiences who rely on these channels for information and engagement.

From a theoretical perspective, the study contributes to crisis communication approaches within the field of digital entrepreneurship, highlighting the value of positive emotionality, contextualised storytelling, and visible leadership as core components of symbolic resilience, the last part of which is understood as the communicative capacity of organisations to project strength, legitimacy and emotional alignment with their audiences in times of crisis, while also acknowledging that digital platforms serve not only strategic goals but also act as relational and cultural spaces where trust and collective meaning are co-constructed. Methodologically, the integration of automated analysis tools such as GPT-4 is presented as an innovative and replicable pathway for future research on digital communication in adverse environments.

Among the main limitations are the limited number of interviews and the focus of analysis on only three social media platforms. Future research could explore the impact of post-crisis communication on audience loyalty, the role of micro-influencers in narrative development, and citizens' perceptions through reception studies. Furthermore, an ethical reflection is needed on the use of platforms such as TikTok, which tend to trivialise critical situations, particularly when targeting vulnerable audiences. Moreover, while the use of AI-based sentiment analysis tools such as GPT-4 improves processing power and efficiency, it can also have limitations. These include the potential for contextual misinterpretation, lack of cultural nuance and reliance on algorithmic assumptions.

Ultimately, the experience of startups during the DANA demonstrates that organisational resilience is not limited to operational capacity; it is also shaped by the narratives that organisations choose to build in order to connect with their environment in moments of greatest uncertainty.

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Appendix A

Table A1. Questions asked in the in-depth interview.

Block	Context	Question
Communication Strategies in Risk Situations	This section aims to analyse how companies managed their communication during the meteorological catastrophe caused by the 2024 DANA in municipalities of the Valencian Community.	1. Regarding crisis communication management, how did the company react to this unforeseen event? Did it already have a risk management plan that included specific communication actions? How was communication managed?
		2. During the critical DANA situation, how was the company's internal and external communication?
		3. At the level of social media, were these channels used to communicate with the company's different audiences? If so, how was this communication carried out: was a plan followed, or was it improvised?
		4. If any communication was carried out, how was the type of content (informative, emotional, service-based, supportive...) to be disseminated decided?
		5. Were there changes in the communication strategy as the crisis evolved? What factors motivated these adjustments?
Reputation Management, Risks and Public Relations	Reputation and public relations management can be key to maintaining public trust during times of crisis. In this section, we explore how companies addressed these challenges.	1. Before the DANA, had reputational risks been identified in the event of a climate or infrastructure crisis?
		2. How were comments, criticisms or rumours on social media managed during the crisis?
		3. Were specific Public Relations strategies implemented to reinforce the company's reputation after the DANA?
		4. Was there any message or communicative action that proved particularly effective in strengthening public trust in the company?
Organisational Resilience and Risk Management	Organisational resilience focuses on a company's capacity to adapt and recover from a crisis. This section analyses how organisations faced the internal and external challenges posed by the 2024 DANA.	1. How did the company's leadership influence the communication strategy during the crisis?
		2. What aspects of organisational culture helped maintain team stability and confidence during the crisis?
		3. How did the crisis affect business continuity?
		4. Were financial, logistical or operational risks identified? If so, how were they managed?
Impact Assessment and Lessons	As a final aspect to analyse, this section proposes a reflection on the impact the DANA had on the organisation and how companies can strengthen their risk management in the future.	1. Do you think the crisis management affected the company's reputation? If so, in what way? Did it strengthen or weaken it?
		2. Do you consider the impact of the DANA to have been more severe for your company, as a startup or emerging business, than it would have been for a more established one? If your company had had a longer track record in the market, do you think communication management would have been different? In what sense?
		3. What key lessons have been learned about communication management during times of crisis?
		4. What recommendations could be offered to other startups regarding how to manage their social media communication during crisis situations?

Table A2. Sentiment analysis by GPT-4. Instagram.

Date	Post Message	Sentiment	Justification
8-Nov-24	With the aim of helping all those who came as volunteers, we have tried to gather all the possible and verified information about the organisation in each municipality. Not all are included, not because help is not needed (HELP IS STILL NEEDED EVERYWHERE), but because we prefer not to share unverified information. We will continue expanding this information as we gather more data. It's a slow process... For now, here is some data that may be useful. Thank you for your help and goodwill ❤️🩹.	Positive	The message emphasises support, organisation, and solidarity. Despite logistical challenges, the tone is collaborative, encouraging volunteering and coordinated action.
2-Nov-24	The DANA has left many needs. But also many hands ready to help. Let's connect needs with resources ❤️🩹.	Positive	Though the DANA crisis is acknowledged, the tone is hopeful and proactive. It highlights community support and resource coordination to overcome adversity.
24-Dec-24	Harry's tender reaction when receiving his favourite video game from his grandfather is pure emotion. That hug says it all. What he doesn't know yet is that the greatest gift is, and always will be, the shared time and those unique moments together. 🎄👴👵❤️ #grandkids #grandparents #eternalgrandparents #love #gift #Christmas #Christmasgift	Neutral	Not related to the DANA crisis; instead, it's a celebration of family values and emotional moments.
11-Nov-24	Please, if you know someone with this knowledge, share this information. Thank you very much!	Positive	Although it stems from an urgent need caused by the disaster, it's framed as an opportunity for collaboration, promoting mutual support and solidarity.
23-Nov-24	Three weeks have passed. Though it may seem long, those living daily in the disaster still feel like it was yesterday. The streets look better, but there's still SO MUCH to do... This cannot be solved in 3 weeks or 3 months. Please help us ensure their situation isn't forgotten. They need us more than ever because they're starting to disappear from the news, yet still need a lot of help... ❤️🩹	Negative	The message expresses urgency and concern for the crisis's ongoing invisibility. While it calls for action, the emotional weight is of desperation and prolonged struggle.
19-Nov-24	Pepe Martí, F2 driver: 'Hopefully, together we can all help restore normal life' 🤝. If you also want to help restore mobility and normality to families, donate through our website, link in bio 📍	Positive	The message conveys hope, solidarity, and community action. Though rooted in the DANA context, it focuses on restoring normalcy through collective effort.
04-Dec-24	☕🔍 Start your day in Rome like a local—cappuccino, cornetto, and a cosy spot you need to try. 📍 Want to know where it is? Watch the video to find out! 📺 @/saraluziamaru #RomeBreakfast #ItalianCafes #CoffeeInRome #FoodieTravel #RomeEats #RomeTips	Neutral	Not related to the DANA crisis.
12-Nov-24	Fernando Alonso, F1 World Champion, joins @solidaridadsobreruedas. 'All together, let's go!!!' 🏎️🤝📍 www.solidaridadsobreruedas.com	Positive	The message is motivational and uplifting, highlighting unity and collective action. A public figure adds visibility and encourages participation.

Table A2. Cont.

Date	Post Message	Sentiment	Justification
12-Nov-24	<p>“But despite everything, we’ll say we’re okay, because at least we’re alive.” We read this phrase in a shared post. Each time you read it, it breaks you a little more. Even having lost everything, they do not allow themselves to complain. Two weeks since the DANA, weeks of shadow and sorrow. But in those shadows, there is also light: all those who have helped however they could. There’s still much to be done. Let’s share images showing the current state of affected areas—to show how much remains to be done, and to recognise all that has already been achieved. Thank you to all volunteers. These families will never forget you 📍❤️🩹.</p>	Negative with positive undertones	The message conveys pain, grief, and loss, which categorises it as negative. However, it also highlights resilience and community support, introducing a positive undertone of solidarity.
15-Nov-24	No message	Undetermined	No sufficient information available to determine sentiment.

Table A3. Sentiment analysis by GPT-4 during the DANA. Instagram.

Date	Post Message	Sentiment	Justification
12 Nov 2024	<p>Fernando Alonso, F1 World Champion, joins @solidaridadsobreruedas. “All together, let’s go!!!” 🚗🏍️👍 www.solidaridadsobreruedas.com</p>	Positive	The message conveys enthusiasm and support for a solidarity cause, with a motivating and optimistic tone reinforced by emojis.
13 Nov 2024	<p>“Donating vehicles to affected individuals so we can soon recover some normalcy.” Thanks to everyone making this possible ❤️🩹🚗🏍️. If you also want to join @solidaridadsobreruedas, link in bio 📍</p>	Positive	It expresses solidarity and a hopeful desire for recovery, in an empathetic and grateful tone.
13 Nov 2024	<p>Roberto Merhi, former F1 driver joins. “People have no way to move, and this initiative helps return to normality as soon as possible” ❤️🩹 Join too. Link in bio 📍</p>	Positive	Although a difficulty is mentioned, the focus is on solution and support, with a hopeful tone.
14 Nov 2024	<p>Nani Roma, Dakar Rally Winner, joins @solidaridadsobreruedas! “Restore mobility and make everything a little easier.” If you want to collaborate ❤️🩹🚗🏍️, link in bio 📍</p>	Positive	Conveys empathy and commitment to improving the situation of those affected, in a warm and optimistic tone.
12 Nov 2024	<p>Carlos Sainz, Rally World Champion, joins @solidaridadsobreruedas 📍🚗🏍️ Thanks Carlos for helping restore mobility to those affected by the DANA. www.solidaridadsobreruedas.com</p>	Positive	The message highlights the supportive role of a public figure, with a positive tone of action and gratitude.
11 Nov 2024	<p>The @rfedea joins the cause: restoring mobility to thousands of those affected. Manuel Aviñó, President of the Federation, has seen the initiative firsthand and prepared the first motorbikes to be delivered tomorrow. 📍🚗🏍️</p>	Positive	Shows institutional commitment and concrete actions to help, with a motivational and collaborative message.
10 Nov 2024	<p>We have over 200 vehicles ready to be assigned this week! If you know someone affected, please ask them to register at: solidaridadsobreruedas.com. Help us spread the word 🙏❤️🩹</p>	Positive	Reflects a tangible achievement and a call to action for solidarity, with a practical and hopeful focus.

Table A3. Cont.

Date	Post Message	Sentiment	Justification
12 Nov 2024	Jorge Martínez Aspar, Motorcycle World Champion, also joins the initiative @solidaridadsobreruedas 🛵👉 #restoremobility #SoSR www.solidaridadsobreruedas.com	Positive	Promotes engagement with a solidarity cause by a respected figure, with an inspiring and empathetic tone.
12 Nov 2024	Carlos Sainz, F1 driver, also joins the cause @solidaridadsobreruedas to restore mobility to thousands 🛵❤️🩹. "You can donate a vehicle or contribute financially" at www.solidaridadsobreruedas.com	Positive	Though it refers to a critical situation, the message focuses on solutions and collective mobilisation.
04 Nov 2024	WE HAVE INVESTED PART OF THE DONATION IN A TRUCK AND CRANES TO HELP 📍 PICANYA 💰 Cost us €2000 from donations received. 📅 Hired for 3 days, €85/h. 💡 Picanya was chosen due to transport accessibility. 🙏 We are calling for more donations for additional trucks and cranes, more info below. ❤️ HOW TO HELP: Immediate transfers to: ES79 2100 5357 4102 0007 3193. Bizum to: 675 17 26 05. Or send us accounts/entities/brands that can provide material to send. Subject: Dana Donation. THANK YOU TEAM FOR EVERYTHING.	Positive	The message communicates concrete actions, transparency, and a call to continue contributing, in a grateful and constructive tone.

Table A4. GPT-4. TikTok sentiment analysis.

Date	Post Message	Sentiment	Justification
19 Nov 2024	👉 A cheap, beautiful, and history-filled destination in Europe? 🌿 Stunning mountains, 🏰 ancient castles, 🍷 delicious food, and the best part... it's super affordable! 🍀 🏠 Hotels from €15, full dinners for €8, and breathtaking views. What more could you ask for? 📄 Comment 'Georgia' if you want a full travel guide to this amazing destination. 🔔 Follow me for more unique travel ideas! #Georgia #BudgetTravel #Europe #WhatToSeeInGeorgia #GuruWalk	Neutral	The message does not contain emotional elements clearly indicating either a positive or negative tone in relation to the DANA crisis.
09 Jan 2025	What to eat in Japan? 🍜🍜 Here are the must-try dishes when you travel to Japan! From ramen to street snacks, and my favourite spots for each. 😊 Comment if you want a part 2, this is just the beginning. 👉 #Japan #JapaneseFood #Ramen #TravelToJapan #Okonomiyaki #StreetSnacks #Gyozas #TravelTips	Neutral	The post contains no emotional reference or relevance to the DANA crisis.
17 Jan 2025	🗣️ What can someone who's already done Erasmus in your city offer you? Honestly, everything. That's why we want you to hear the stories of people just like you who've already experienced it. From advice to real stories that you'll find helpful. 🗣️ Not convinced? Check it out on our site: erappmus.com	Neutral	There is no emotional component or thematic connection to the DANA crisis.

Table A4. Cont.

Date	Post Message	Sentiment	Justification
30 Jan 2025	<p>😊 Together, we're building the world's largest Erasmus community. Today we challenge you to reach out to those who've already lived it. If you're one of them, send us a video sharing your experience: what you wish you'd known before leaving, to help those who are just getting started. Are you in? 😊 #erasmus #erasmuslife</p>	Neutral	The message has no emotional weight relevant to the DANA crisis.
21 Jan 2025	<p>Will Erasmus drain your brain or your wallet first? To make sure it's your brain, here are some tips to earn money. 💰 Use them to fund your trips—or you'll regret skipping this video. 😊 Want to know what else we offer? erappmus.com</p>	Neutral	No clear emotional or crisis-related framing is present.
20 Dec 2024	<p>2025 is your year to study and work abroad—not just our opinion, but @martaregistrada's too. #studyabroad #liveabroad #workabroad #australiatiktok 🇺🇸 #australia 🇺🇸 #aussiethings #growproexperience</p>	Neutral	The message promotes international mobility without emotional connotations related to DANA.
13 Jan 2025	<p>✈️ Choosing your Erasmus destination is harder than it seems, so we've prepared this basic guide. Want us to talk more about a specific country? #erasmus #erasmuslife</p>	Neutral	Informational and neutral in tone, not connected to the DANA crisis.
27 Dec 2024	<p>"We are all works in progress"—Carmen Dell'Orefice At 93, she continues to break barriers in fashion, proving that beauty has no age. With over 70 years as a model, she inspires us to live every stage with style and confidence. 🌟👗 #TimelessElegance #InspiringElders</p>	Neutral	This inspirational post does not reference crisis themes or emotions relevant to the DANA context.
16 Jan 2025	<p>🍜🍱 Tokyo isn't just an incredible city—it's a food paradise! 🌟 If you're visiting Japan, you can't miss these 3 foodie spots: unforgettable ramen, sushi, and gyozas. 🍡❤️ Which one would you try first? Drop it in the comments 👉 and share this with your foodie friend. 🌟 Discover Tokyo like a local with a free GuruWalk tour. It's the best way to explore its hidden gems! 🗼</p>	Neutral	Touristic and culinary in nature, with no emotional association to DANA.
26 Nov 2024	<p>📱 Stay updated... 📱 All products available at: https://gtautomocion.shop •• #angelgaitan #Germany #factory #adblue Original sound-Gtautomocion.shop Discover all GT Automoción products and shop easily on our website.</p>	Neutral	Purely commercial and unrelated to the DANA crisis in any way.

Table A5. Sentiment analysis by GPT-4 during the DANA. TikTok.

Date	Post Message	Sentiment	Justification
11 Nov 2024	We have a winner! 🏆🚗	Neutral	Although the message conveys joy, it is not related to the DANA or the solidarity context analysed, so it is classified as neutral.
13 Nov 2024	The first time you see a sunrise in Australia changes you. #growpro #growproexperience #australia #australia🇺🇸 #australiatiktok🇺🇸 #livinginaustralia #studyinginaustralia #workinginaustralia #sunriseinaustralia	Neutral	The message is positive but entirely unrelated to the DANA; therefore, it is classified as neutral.
15 Nov 2024	New product now available on our website! AG-02 Anti-Friction 🚗 📱 https://gtautomocion.shop/products/anti-friccion-tratamiento-para-motores (accessed on 15 March 2025)“ Instructions for use: Shake the bottle before use. Add the content to hot engine oil. Safe dosage up to 20% of the oil fill volume. Do not exceed the maximum oil level. Full effectiveness after approximately 1000 km. One bottle is enough for 5 L of oil. Not suitable for transmissions. @Ángel Gaitán	Neutral	Promotional content with no connection to the DANA or solidarity efforts.
06 Nov 2024	One of the most iconic destinations in Australia you can visit while studying and working there. #growproexperience #growpro #australia #aussielife #australia🇺🇸 #australiatiktok🇺🇸 #aussie #byronbay Not bad, right?	Neutral	Tourist content with no connection to the DANA or the aid context; it is classified as neutral.
14 Jan 2025	Lorena contacted us to share her story. After the DANA, #metrovalencia stopped running and now she, like many others, struggles to get to work daily. 👤 Neighbours WITH cars in Valencia and surrounding areas: we need you to offer rides. 👤💡 Neighbours WITHOUT cars: we're here to help you move around. 🚗 Volunteers from across Spain: organise shared rides to Valencia for those who need them most. 📍 guruwalk.com/anem #anem #dana #danavalencia #valenciadana #helpdana #volunteers #realstory #metrovalencia	Positive	The message presents a difficult situation but proposes concrete, community-based solutions in an empathetic and hopeful tone.

Table A5. Cont.

Date	Post Message	Sentiment	Justification
14 Nov 2024	<p>URGENT, VALENCIA! 🚨🚗</p> <p>Many people have lost their cars or are unable to get around, making it hard to get to work, doctors, or other important places. But there's something we can do to help!</p> <p>From ANEM!, we launched an initiative to help all those affected: a FREE carpool platform to support those in need.</p> <p>👉 If you're a driver, join ANEM! and share your rides. Every trip you offer could make a big difference.</p> <p>👉 If you urgently need a ride, sign up and tell us your travel details!</p> <p>🔗 Just search guruwalk.com/ANEM, join the initiative and start carpooling 📍</p> <p>Share this message so more people can help. Because when we help each other, we're stronger! ❤️🩹</p>	Positive	The message is directly related to the DANA and conveys solidarity, cooperation, and hope.
07 Nov 2024	<p>Hi, I'm Luisa Ortega from Paiporta, Valencia. I'm taking this route from Paiporta to Valencia to raise awareness so what happened in our towns isn't forgotten. At Farma Leaders, we are still raising money exclusively to rent trucks and cranes to speed up the debris removal process.</p> <p>If you see this video, please help us spread the word. Comment if you know of a company or individual with trucks or cranes.</p> <p>❤️ HOW TO HELP</p> <p>Immediate transfers to: ES79 2100 5357 4102 0007 3193</p> <p>Bizums to: 675 17 26 05</p> <p>Let us know of any accounts/entities/brands that can provide materials.</p> <p>Subject: Dana Donation.</p> <p>In under five days, we've raised over €10,000, and every financial movement has been publicly shared in our stories.</p> <p>THANK YOU THANK YOU THANK YOU</p> <p>#valencia #dana #helping #flood</p>	Positive	The message depicts an affected environment but promotes resource mobilisation and community spirit with a positive and transparent tone.

Table A5. Cont.

Date	Post Message	Sentiment	Justification
28 Oct 2024	<p>Did you know there's a free city within the city of Copenhagen?</p> <p>Christiania is a unique neighbourhood, outside the EU 🇪🇺, with its own lifestyle, street art 🎨 and even its own rules. Discover it with a GuruWalk free tour and explore the other side of Copenhagen.</p> <p>#fyp #christiania #denmark #adventure #halloween #erasmus #funfacts</p>	Neutral	Post about Denmark with no relevance to the DANA or the situation in Valencia.
06 Nov 2025	<p>Having trouble getting around Valencia after the DANA?</p> <p>With Anem!, you can find people to share rides and make travelling easier.</p> <p>Filter by time and destination and join this carpooling initiative to keep everyone moving. Share this so more people know and we can ease traffic!</p> <p>#Valencia #DANA #Anem! #GuruWalk #trafficjam #valenciadana #helpdana</p>	Positive	Direct reference to the DANA with a useful, solidarity-based solution promoting collective movement.
05 Nov 2024	<p>Help with transport in Valencia and affected areas! Due to the effects of the DANA, *thousands of people are left without vehicles* and public transport and need help getting to work, medical appointments, or any essential destination.</p> <p>That's why Hoop Carpool is offering *TOTALLY FREE* car sharing throughout the province of Valencia with the 'AyudaDANA' campaign.</p> <p>Now is the time to make use of all available vehicles to support those who need them most.</p> <p>🚗 Download the Hoop Carpool app (link in BIO), register using the institutional code 'AYUDADANA', and post your trips to find matches.</p> <p>If you know any carpool WhatsApp groups, please share this message so we can reach more drivers. We need everyone.</p> <p>Thank you for being part of the recovery. Together we'll get through this. For any questions, message us at 608 33 76 81 and we'll help you find carmates.</p>	Positive	The message is centred on offering free assistance following the DANA, with an empathetic and collective tone of action.

Table A6. Analysis of GPT-4 sentiment. Facebook.

Date	Post Message	Sentiment	Justification
03 Dec 2024	Can someone explain this to me! 👉👉 •• #Battery #electriccar #floodedcar #dana #danavalencia	Negative	The message expresses surprise or frustration over the effects of the DANA, especially regarding electric vehicles and their batteries. The mention of a 'flooded car' and the exclamatory tone suggest criticism or a negative reaction to the catastrophe.
08 Nov 2024	Today it's me asking for a hand 🙏	Negative	The post expresses frustration about the effects of the DANA on the author's business.
04 Nov 2024	Doing something right today is pointless if your intentions aren't good for the future. A liar is caught faster than a lame person.	Neutral	This message seems philosophical or moralising, without a clear emotional load indicating positivity or negativity in relation to the DANA crisis.
09 Nov 2024	Please don't leave them behind. They need us 🙏👉👉🇪🇸	Positive	The message encourages solidarity and support for those in need, possibly within the DANA context. While the 🙏 emoji adds a playful tone, the overall intent is to motivate help and cooperation.
08 Nov 2024	This is worth more than all the gold in the world.	Positive	The post highlights something emotionally or humanly valuable, likely related to solidarity and support during the DANA crisis.
06 Nov 2024	We're heading out! 🚗 •• #Help #valencia #angelgaitan	Positive	The message conveys action and determination to deliver help in Valencia during the DANA crisis. The hashtags reinforce the message's solidarity and mobilisation intent.
10 Nov 2024	I also want @navedelmisterio_'s head.	Neutral	The post lacks emotional content clearly linked to either positive or negative sentiment.
11 Nov 2024	Good deeds should be shared just like bad ones 🙏👉👉🇪🇸	Positive	The message promotes sharing good actions, encouraging solidarity and the recognition of collective effort.

Table A7. Analysis of GPT-4 sentiment during the DANA. Facebook.

Date	Post Message	Sentiment	Justification
08 Nov 2024	Today it's me asking for a hand 🙏	Negative	The post expresses frustration about the effects of the DANA on the author's business.
09 Nov 2024	Please don't leave them behind. They need us 🙏👉👉🇪🇸	Positive	The message encourages solidarity and support for those in need, possibly within the DANA context. The 🙏 emoji adds a casual tone, but the overall intention is to inspire cooperation.
08 Nov 2024	This is worth more than all the gold in the world	Positive	The post highlights something emotionally valuable, associated with solidarity and support during the DANA crisis.
06 Nov 2024	We're heading out! 🚗 •• #Help #valencia #angelgaitan	Positive	The message expresses action and determination to provide help in Valencia during the DANA. Hashtags reinforce the solidarity intention.

Table A7. Cont.

Date	Post Message	Sentiment	Justification
10 Nov 2024	I also want @navedelmisterio_'s head.	Neutral	This post lacks strong emotional content and is unrelated to the crisis context.
11 Nov 2024	Good deeds should be shared just like bad ones 🤔👉🇪🇸	Positive	Encourages the visibility of positive actions, fostering solidarity and collective recognition.
05 Nov 2024	Message for Pedro Sánchez. Please make sure he receives it.	Negative	Although context is limited, the tone suggests a critical or demanding attitude, potentially reflecting dissatisfaction linked to the DANA.
05 Nov 2024	We've started the first deliveries in Catarroja	Positive	This message signals the beginning of aid efforts after the DANA, reflecting commitment, coordination, and hope.
05 Nov 2024	https://live.isharing.me/map/?map_id=39402356rjvL	Positive	Although it only includes a link, the context and tone suggest an ongoing solidarity action related to logistics and assistance.

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