

Crisis Communication 4.0: Evaluating the Role of Artificial Intelligence in Public Trust Management

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Abstract

The 4th era of crisis communication is here, and organisations have started building automation through artificial intelligence (AI) for drafting crisis messages. Crisis Communication 4.0 is the point where organisations are able to integrate digital methodologies, artificial intelligence, and real-time data analytics for monitoring and communication with stakeholders in crisis communication. This study investigates the variables of trust for AI and human crisis messages in a controlled experiment. A between-participant design was used to show 1,200 Indonesian university students a fictitious data breach scenario and assign them to view either an AI-generated statement or a human-generated statement. Trust was defined in the study as a derived perceptual construct made of the components: consistency, timeliness, sincerity, and credibility. Quantitative data was collected through independent t-tests and multiple regression analyses, which found that AI crisis messages were perceived as more timely and consistent, while human messages were perceived as more sincere and credible. Regression analyses indicate that sincerity has the highest effect on overall trust ($\beta = 0.36$). These findings challenge deterministic perspectives that place AI communication and human communication on opposing ends and instead suggest a synergistic model of communication with AI enhancing operational efficiency and humans providing the ethical and emotional recalibrations. This study reframes the trust attributes as perceptually and socially constructed instead of the trust attributes as based on the communication itself, providing a theoretical starting point to capture the complexities of ethically explainable AI in crisis management.

Keywords: crisis communication, AI ethics, public relations, trust management, digital credibility, process innovation

1. Introduction

In present-day society, crisis communication goes beyond the distribution of press releases. Organisations are now dealing with real-time communications on public opinion formation as information proliferates, mainly through social media and online news. The use of real-time sentiment analysis, natural language processing, and generative Artificial Intelligence communication technologies is transforming the automation and personalisation of an organisation's communication during a crisis. This is the phenomenon called Crisis Communication 4.0. The use of AI and automation in communication extends beyond the private sector and governmental communication (Cheng et al., 2024). Nevertheless, while AI systems, for example, can address empathy and moral issues, respond to the information crisis, and tackle problems of authenticity and responsibility, these issues will remain (Cheng et al., 2021).

The foundation of successful crisis management relies heavily on public confidence. When assessing responses to a crisis, stakeholders consider not only the factual accuracy of the response but also the apparent genuineness, openness, and trustworthiness of the source (Schoofs et al., 2022).

From examining the literature, there is also a gap in the research that addresses the fact that while automated AI responses are timely (and often effective), the ability to develop and maintain Authoritative Relational Trust is greatly hindered due to emotional unintelligence, and more importantly, situational contextual void (Cavins, 2021). The increased speed of AI technology is an improvement; however, mitigating public distrust and managing the emotional and ethical voids are greater challenges.

Most previous studies on the role of artificial intelligence (AI) in crisis communication focused on the technology's automation capabilities, such as supervision, chatbot responses, and prediction of crisis escalation (Hossain et al., 2025). During crises involving damage to a corporation's reputation, AI chatbots display slower response times, although, as analysed by Prahl & Goh (2021), the coherence of messages sent during the crisis increases. Like the study by Felzmann et al. (2020) on AI and the construction of digital trust ecosystems, there is a paradox of transparency of data and accountability of algorithms. Lee et al. (2025) argue that given the emotional element of the communication, the AI-generated messages at a time of crisis are the most untrustworthy. This paradox illustrates the unevenness that exists between a given level of technological sophistication and the human factor in communication.

Despite the growing need for AI technologies for digital crisis management literature, there is a notable absence of research concerning the public's trust in AI-generated messages as opposed to messages written by humans (Zhan et al., 2025). In this regard, the more pertinent issue is whether AI is capable of exercising sufficient 'empathy' and 'responsibility', and whether it can provide comfort in a state of crisis. Most literature accessible to us is that of public relations specialists who have employed AI; however, there is a dearth of evidence on large-scale, systematic studies of the public's reaction to AI in crisis communication (Simchon et al., 2024).

Earlier crisis communication scholarship has consistently emphasised relational trust and perceived organisational responsibility as key determinants of crisis response effectiveness. Studies by Coombs (2007), Ulmer et al. (2015), and Fearn-Banks (2017) demonstrate that stakeholder evaluations of crisis responses depend heavily on perceived sincerity, transparency, and accountability. These foundational insights remain relevant in digitally mediated communication environments, suggesting that integrating artificial intelligence into crisis messaging must still address the relational dimensions of trust.

In this paper, the authors propose a benchmark for the fusion of AI, automation, and humans, combining a low-cost, high-volume, rapidly scalable response system with the ability to empathise, contextualise, and respond morally to the crisis. It focuses on providing "augmented sincerity," which they deem the appropriate emotional balance for the rapid response system. This research benchmark empirically examined the integration of AI into public relations (PR) crisis communication. Consequently, this research examined the incorporation of AI into the public relations and crisis communication frameworks.

The research team recruited and surveyed 1,200 subjects from three of Indonesia's most prominent universities, accounting for geographical and cultural heterogeneity and digital reading skills. The responses in the dataset involved two different crisis response types: (1) a message produced by an AI using an optimised model for generating text, and (2) a message composed by a communication professional in conformity with the principles of crisis communication.

Trust, integrity, genuineness, unfiltered transparency, communication clarity, and communication honesty were mentioned by participants. Each individual was assigned a number in order for individual averages to be computed. Each individual's total was averaged to compute a final score, and that score was analysed. The planned methodological approach merged quantitative strategies and experimental design with a control group using a scenario framework in a number of inter-participant exercises in which participants were randomly assigned to a group called AI or Human. The participants' trust and feedback, as well as the results of the participants, were evaluated using T-tests and several regression analyses to determine the degree of trust and feedback that the participants received.

The literature on crisis communication has consistently highlighted the importance of trust and the protection of a stakeholder's reputation during times of organisational crisis (Coombs, 2007; Fearn-Banks, 2017). Within this context, the Situational Crisis Communication Theory (SCCT) encapsulates the relationship between crisis response strategies and stakeholders' perceptions concerning responsibility, trust, and credibility. It is within this context that the effectiveness of a message is complemented by the perceived empathy, openness, and ethical responsibility accompanying the message.

One of the dominant narratives in the literature is that the adoption of new technologies for communication is primarily about the efficiency of technology and the sincerity of humans. Such narratives disregard the social construction of trust and the fact that the design of communication may evoke and contextualise the audience's expectation of the attributes of empathy and authenticity. In doing so, the current study attempts to address such criticisms by reframing the dimensions of trust as the outcomes of perception and assessing the impact of the source, design, and delivery of the message on such perceptions. In doing so, the study attempts to take the theory of crisis communication beyond techno-determinism to a socio-technical framing of trust in Artificial Intelligence.

This research is part of a Communication Studies degree, which, in this case, is primarily focused on Artificial Intelligence and Contracts Communication. Here, the specific focus is on AI and Stakeholder Communication during a crisis, and the erosion of trust due to the unavailability of communication that is open and transparent, which is critical in any communication that is aimed at resolving a crisis. The social implications of Artificial Intelligence systems call for the examination of the sufficiency of these systems to duplicate, if not exceed, human levels of communication.

This research aims to analyse the extent to which the public favours Artificial Intelligence (AI) systems over human beings in the field of crisis communications. The study also examines, using a quasi-experimental design, the management communication of empathic responsiveness. This research focuses on the extent to which the audience's perception is affected by message fragmentation, message delay, and affective message credibility. These factors constitute the foundational elements of trust and will reflect the extent to which the organisation will recover and restore its credibility and trust in the marketplace.

Besides the comparative study, the purpose of the study is to construct an original composite of Crisis Communication 4.0 that designs an integration model of the strengths of AI with the emotional, ethical and situational awareness of the human communicator. In this case, AI is viewed as a division of labour that is not communicative, but is an adjunct to human communication that can facilitate a quicker response time while still retaining the human factor.

In addition to this, the study focuses on the new emerging cross-field of the Ethics of AI, Digital Trust, and Public Relations in the context of the Fourth Industrial Revolution. This study combines theory and practice to show how organisations can achieve that balance of automation and human engagement and reinstates the trust of the public in algorithmic communication systems.

This research develops the existing theory of crisis communication by applying a socio-technical lens on the construction of trust in communication systems that are mediated by algorithms. Unlike previous theories on crisis communication that focus on human strategic messaging, this research shows that trust formation is a product of the instrumental variables of a technology (i.e. the algorithms) and the variables of a communication relationship (i.e. the communication relationships). This research is the first to compare and contrast AI and human-written crisis communication messages, thus positing a new way of thinking about hybrid crisis communication systems, where the automation of communication and the human component work in tandem to develop public trust.

2. Method

2.1 Research Design

The study employed a quantitative experimental research design to measure trust and perceptions of an AI-human crisis communication (Liu et al., 2025). A between-participants design, where respondents were randomly allocated to one of two conditions: an AI crisis statement and a human crisis statement. This study design allows for the perception of trust variable(s) to be analysed statistically along with some additional control(s) such as age, digital exposure, and familiarity with AI (Kučinskas, 2024).

A post-test control design was used because the study participants' perception was obtained after the stimulus was read. This was to avoid the exposure effect and obtain participants' perceptions and responses with respect to the varieties of the communication channels in real time.

2.2 Participants and Sampling

There were 1,200 expected respondents for the study, who were from three (3) different universities in Indonesia, representing different geographical areas, fields, and levels of study. A stratified sampling technique was used to enable the proportionate distribution of respondents across the strata. The respondents also had to be digitally literate and had to have been previously exposed to online content and systems so that they could understand AI content generated by systems.

The AI condition dataset has 598 participants, and the human condition has 602 participants. The average age of the participants is 21.80 years, and the gender ratio is 55% female and 45% male. Most participants use digital media platforms every day, which is in line with the communication practices of the population.

University students, as the first target audience, are good representatives because they are exposed to media algorithms and AI communication and are high digital literacy users. However, this audience is not representative of the whole population; hence, conclusions should be drawn for digitally oriented stakeholders only.

2.3 Experimental Stimuli

The text that crisis statements are about relates to a fictional data breach of a public organisation.

- The AI-generated statement was produced using a fine-tuned GPT-based model, trained on public relations datasets to generate formal, empathetic messages.
- Professional communicators wrote the human-issued statement, each with at least 5 years of experience in corporate communication.

The two messages were equalised in terms of word count and structure to about 160 words to ensure that any variations in audience responses were due to the source (AI vs. Human) rather than to the same content length and complexity

2.4 Measurement Instruments

Data collection was conducted using a structured questionnaire with two parts. The first section collected demographic data, and in the second part, data were collected on perceptions of trust using standardised Likert scales (range 1 = strongly disagree to 5 = strongly agree). Public trust was operationalised into four components (Almaaitah et al., 2025).

- Consistency – perceived reliability and coherence of the message
- Timeliness – perception of responsiveness and information speed,
- Sincerity – perceived empathy and emotional authenticity, and
- Credibility – perceived truthfulness and expertise of the communicator.

These four dimensions were selected because prior crisis communication research consistently identifies reliability (consistency), responsiveness (timeliness), emotional authenticity (sincerity), and source expertise (credibility) as the principal antecedents of stakeholder trust. The dimensions described here encompassed both the functional and the relational aspects of the constructs of interest. This allows for an exploration of the dimensions that diverge from the estimation of the informational accuracy of the crisis messages.

The scale items were developed in a crisis communication context by Van der Meer & Kroon (2022). Reliability analysis yielded a Cronbach's alpha of 0.89, which indicates a strong internal consistency of the scale.

2.5 Data Collection Procedure

Given the time constraints of the study, the researchers opted for an online survey that participants could complete from any location and on any device. After providing their informed consent, participants were randomly assigned to one of the two message conditions. Each participant received and reviewed one crisis message and then answered a set of questions. In order to obtain an adequate representation of all necessary demographics, data collection was extended to a duration of three weeks.

All researchers obtained ethical clearances from the relevant research ethics boards of the institutions involved in the study. The data collected was for educational purposes only, and the researchers guaranteed that the participants would remain anonymous.

2.6 Data Analysis Techniques

Utilising SPSS version 29 and SmartPLS 4 (Ayu et al., 2024), the structural model's validation was carried out. Francke (2022) described how average trust levels of the respondents were processed and framed using descriptive statistics. Average trust levels were evaluated using multiple regression analysis, and independent variables were tested to find the best predictors of trust (Lotfalian et al., 2025).

EFA validated the trust scale model, which was then followed by construction validation through CFA (Deniz & Erdener, 2023). A statistical significance of $p < 0.05$ was used to determine the difference. Practical significance of the differences was assessed using Cohen's d (Vaske et al., 2024).

2.7 Research Objectives Alignment

The methodical design is appropriately tailored to meet the study's objectives, which are to:

- Examine the difference in levels of trust an audience has when communicating via an AI versus a human during a crisis.
- Determine which of the trust characteristics—consistency, timeliness, sincerity, or credibility—are impacted the most by AI, and
- Justify the development of a hybrid ethical framework for Crisis Communication 4.0 that balances the human touch with the efficiency of AI.

This design strikes a balance between the study's analytical intricacy and practical significance within the intersecting domains of AI ethics, public trust, and the emerging field of digital crisis management.

3. Results and Discussion

3.1 Descriptive Statistics

The dataset comprised 1,200 valid responses, including 598 participants in the AI condition and 602 in the human condition. Validation of the dataset to assess normality was the first step. There was no skewness or kurtosis above 1, and no multicollinearity was found. Overall, trust ratings were moderate in both conditions.

- AI-generated statement: $M = 3.47$, $SD = 0.64$
- Human-issued statement: $M = 3.81$, $SD = 0.58$

AI systems were perceived to be trustworthy in communication, and human messages were slightly more trustworthy, especially in emotionally sensitive issues.

3.2 Comparative Analysis of Trust Attributes

In order to assess the disparities in the four trust attributes of AI and human messages, independent samples t-tests were conducted as illustrated in Table 1 and Figure 1. Table 1 presents the comparative analysis of trust attributes between AI-generated and human-authored crisis messages.

Table 1. Comparative Analysis of Trust Attributes

Trust attribute	AI (M ± SD)	Human (M ± SD)	t-value	p-value	Interpretation
Consistency	3.94 ± 0.71	3.87 ± 0.69	1.42	0.156	No significant difference
Timeliness	4.12 ± 0.63	3.91 ± 0.66	3.48	0.001	AI perceived as faster and more efficient
Sincerity	3.05 ± 0.79	3.82 ± 0.72	-11.29	< 0.001	Human messages perceived as more sincere
Credibility	3.48 ± 0.68	3.76 ± 0.64	-6.14	< 0.001	Human messages more credible

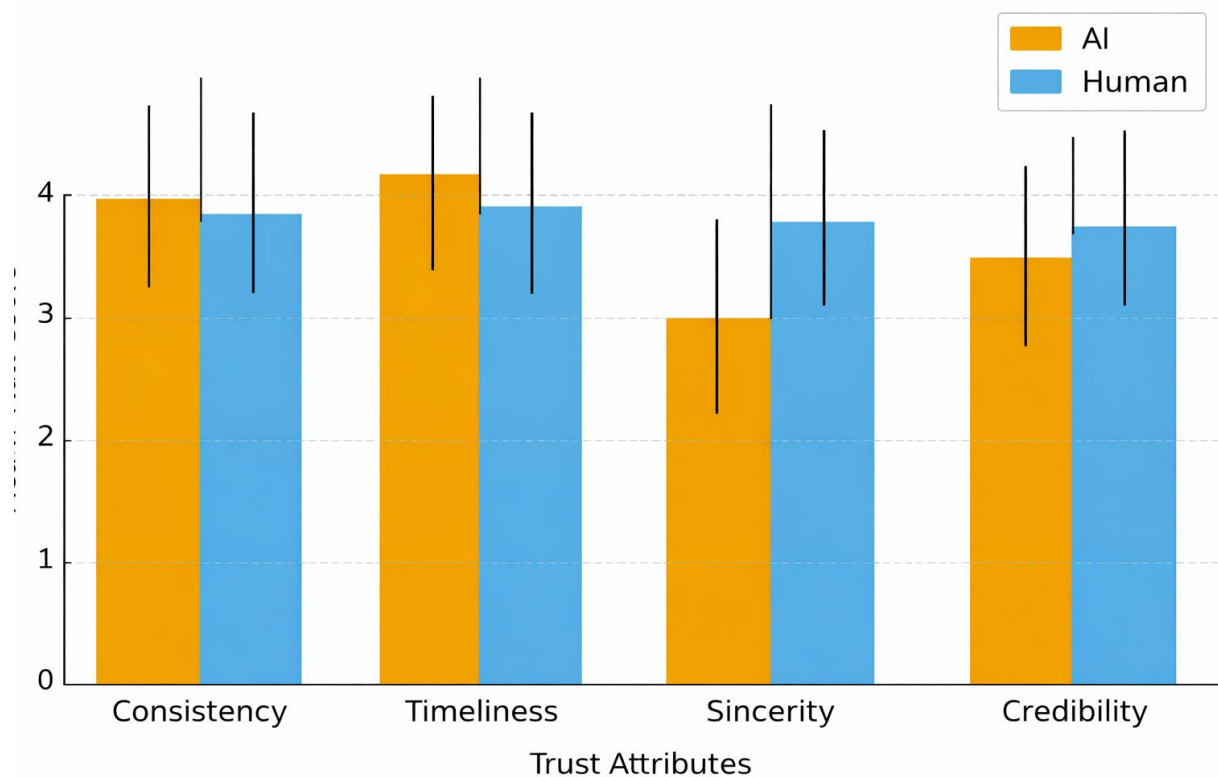


Figure 1. Comparative Analysis of Trust Attributes

As the results show, in terms of automation, AI is better than humans in message timeliness and to a lesser in message consistency. Although AI systems demonstrate operational advantages in speed and consistency, participants perceived them as less emotionally authentic. This suggests that perceived sincerity may depend more on communicative cues and contextual framing than on the message source itself.

3.3 Regression Analysis of Trust Predictors

Here, we aim to identify the attributes that best predict overall public trust. The overall model was significant ($F(4, 1195) = 176.21, p < 0.001; R^2 = 0.41$), as shown in Table 2 and Figure 2.

Table 2. Regression Analysis of Trust Predictors

Predictor Variable	β Coefficient	t	p-value	Interpretation
Consistency	0.22	5.13	< 0.001	Moderate positive effect
Timeliness	0.18	4.71	< 0.001	Positive but smaller influence
Sincerity	0.36	8.09	< 0.001	Strongest positive predictor
Credibility	0.28	6.34	< 0.001	High positive influence

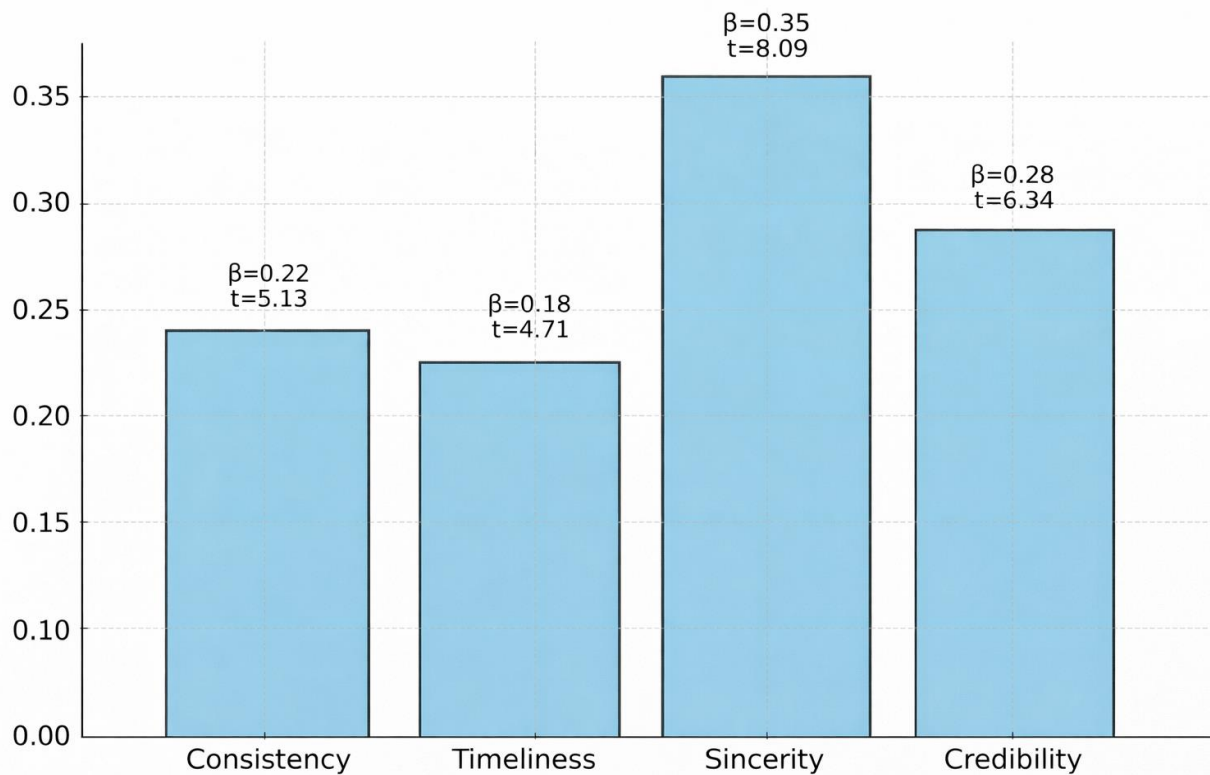


Figure 2. Regression Analysis of Trust Predictors

Moreover, regarding the relationships among trust and the other variables, the most significant predictor of trust was the participant's self-reported degree of confidence in the communicators in their assigned video. They also reported the communicators in their videos as the most credible. The second predictor of trust was participants' reported degree of confidence in the communicators in their assigned video.

3.4 Interpretation of Findings

Crisis communication models rely on trust-building as a core premise. The developed, comparative, and regression models also provide an understanding of several patterns of trust within the realm of AI-enhanced crisis communication.

- **AI Strengths:** The speed and consistency of responses from an AI automation system present a unique advantage over utilizing a communication management system. This attribute of AI automation systems strengthens their ability to aid in the management of information aimed at the prevention of the spread of misinformation and, more importantly, in crisis situations.
- **AI Weaknesses:** Regardless of the operational simplicity provided by functionality systems, AI systems seem to struggle with the operational systems of relationship building, more specifically, the relational warmth and sense of trust associated with position. AI system responses being described by participants in the study as 'mechanical' and 'emotionally absent' synergise with the observation of Van der Meer & Kroon (2022) that there is a distinct absence of emotional warmth in AI responses.

The research outcomes align with the Computational Empathy Deficit Hypothesis, which posits that the communicative processing of AI systems fundamentally lacks the emotional components necessary for the other party in the communication to feel empathetic (Čekić, 2025). The communicative systems of large language models are designed to function with the capability to “detect” Empathy; however, people can recognise the absence of certain fine marks of authenticity, such as tonal variations, moral positioning, and assumed responsibility.

Future work should also examine how training data selection, prompting strategies, and stylistic calibration influence perceived empathy and credibility, as these design choices may substantially shape audience trust in AI-generated communication.

3.5 Theoretical Implications

The study enriches the theoretical framework of Crisis Communication 4.0 by establishing AI as a partial mediator,

rather than a replacement for, the human element in the construction of trust. The findings enrich the Situational Crisis Communication Theory (SCCT) proposed by Coombs, demonstrating that in the age of digital communication, human moral presence and operational capability cannot be circumvented.

Additionally, the results validate the preliminary work on the intersection of artificial intelligence ethics and transparency in communication, and assert that trustworthiness in this era of computing is tied not only to truth but also to the alleged ill will behind the intelligence. Thus, AI tools should be built to augment, rather than supplant, human decision-making in ethics, particularly in crises.

3.6 Practical Implications

Evidence in this case emphasises the need for multi-channel communication approaches in times of crisis. Organisations ought to use AI applications for rapid message generation, monitoring, and distribution. Still, they should also include human resources who have the final authority to approve messages and modulate the emotional tone, if required. This balances the need for a speedy response with the need for emotional and moral sensitivity.

Because tools will be augmented to some extent, it is essential to train communication teams to work collaboratively. This means that AI tools will need to generate preliminary drafts for communicators to edit. They will need to be taught not only to omit insensitive and irrelevant elements, but also to ensure that narratives are appropriate in tone for the context in which they will be used and to maintain the ethics of trust in public communication. As a result, public communication and public relations may need to develop guidelines to improve accountability in communication within the context of artificial intelligence.

3.7 Summary of Findings

To summarise, the findings indicate that:

- There are instances in a crisis when the human element is paramount, and therefore, while the automation of responses provides the greatest efficiency and consistency, communication should be human-driven.
- In public relations, the building of credibility and trust is an important relational outcome, and for these outcomes to be achievable, they must be authentic.
- The more preferable and ethically sound approach to crisis management in the digital age is a mixed model, that is, a combination of automation with artificial intelligence and emotional intelligence.

4. Conclusion and Future Work

4.1 Conclusion

This research shows how artificial intelligence enhances crisis communication in terms of efficiency and speed of operational responses, while retaining the human element to provide needed empathy, strengthening attestation, and confidence. The results, in addition to maintaining a non-antagonistic relationship between artificial intelligence and human communication, also support the relationship as a model of symmetry in the communication process, where the artificial intelligence side can be the instrumentally efficient side, while the human side can be the ethically soft, emotionally attuned, and discretionary valuable side. Trust, in the virtue of parochial and intrinsic characterisations, is more comprehensively explored in this study as a contextual perceptual construct shaped communicatively. Organisations ought to configure their AI systems to address the rapid drafting and monitoring of messages, with human supervisors customising the final messages. This arrangement accommodates the advanced technological possibilities of AI and the relational/technological gap of humans.

4.2 Implications

This study has both theoretical and practical implications. Conceptually, it supports and adds to the expanding research on the Situational Crisis Communication Theory (SCCT) and pushes the boundaries to the online space, where stakeholders employ AI as co-communicators. The study adds to the empirical research that supports the claim that trust in communicators and communication is not based on a false construct, but on authenticity, rather than the truth.

Practically, the study provides a strong rationale for the adoption of a hybrid communication model by organisations. In this model, AI should only be used to compose draft messages and reports, and to monitor in real time, while a human employee should review and add informality to the messages before they are sent. Furthermore, of the many expectations in public relations, the use of AI, a working knowledge of the advantages, disadvantages, and the ethics of algorithmically generated text are crucial to the preservation of the ethics and transparency of public discourse.

4.3 Limitations

This study covers essential issues; however, some concerns are noted. The study design involved only one scenario during the breach experiment, which does not include a range of crises, including disasters, failures, and even political scandals. Further, the study involved only university respondents in Indonesia, which may not be representative of the

findings and may not be applicable across other cultures or professions. The AI model chosen for this study, while sophisticated, was only one of many and belonged to a specific class of generative AI. Different results could be obtained with other AI or by employing other prompt engineering strategies.

4.4 Future Work

This study provided a foundation for future research in many ways. First, future research on intercultural differences and how cultural customs and emotional systems may intertwine to shape how AI systems are viewed in terms of their credibility and the emotional complexity they may exhibit. Second, the emotional dimension may be further evaluated by using voice or audio synthesis, avatars, or chat interfaces to determine whether emotional involvement is more pronounced in particular non-verbal communication. Third, future research may examine trust equilibria over time to see if, and how, the public's trust is built over a prolonged period as trust and exposure to the system increase.

Future research should also examine the public's trust and confidence in AI-generated crisis communication based on the public's level of trust in their institutions. Without the element of trust in a system, longitudinal studies may reveal unclear patterns of trust in the system, and AI-generated communication when the public has low trust in the system. Repeated exposure to AI-generated communication and closed communication by the AI system is expected to increase trust, while sustenance of the AI-generated communication is expected to decrease trust due to the paradox of trust. The levels of sustained confidence in the system and trust or distrust in the system may eventually define the threshold beyond which trust fluctuates in a system that the public views as closed.

Furthermore, scholars are encouraged to construct and evaluate the boundaries of ethical AI communication frameworks that consider explainability, fairness, and reasonable human oversight as measurable components. Although the potential to imitate empathy and ethical reasoning will improve with advancing technology, the ethical regulation must also develop to safeguard that automation preserves, rather than erodes, human concerns in crisis communication.

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Author contributions

Prof. AR was responsible for conceptualisation, study design, data collection, and original draft preparation. Dr. TBK contributed to methodology development, data analysis, and validation. Prof DAD was responsible for supervision, formal analysis, manuscript review and editing, and overall project administration. All authors contributed to the interpretation of the results, critically reviewed the manuscript, and approved the final version for publication.

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Data sharing statement

No additional data are available.

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