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Effect of AI-Powered Chatbots on Crisis Communication Efficiency and Trust-Building in Government Public Relations: Mediating Role of Message Customization

Mohamed Mallek[1], Faycal Farhi[2], Riadh Jeljeli[3], Elsir Ali Saad Mohamed[4], Esaaf Hamad[5]

[1]Department of Communication, College of Arts, Humanities and Social Sciences, University of Khorfakkan, Sharjah, UAE. Email: mohamed.mallek@ukf.ac.ae, ORCID: 0009-0009-0906-248X

[2]College of Arts, Humanities and Social Sciences, University Of Dhaid, Al Ain, UAE. Email: ffarhi@uodh.ac.ae, ORCID: 0000-0003-2738-6970

[3]College of Arts, Humanities and Social Sciences, University of Kalba, UAE. Email: riadh.jeljeli@ukb.ac.ae

[4]College of Mass Communication, Umm Al Quwain University, Umm Al Quwain, UAE. ORCID: 0000-0002-2899-1905

[5]College of Arts, Humanities and Social Sciences, Department of Sociology, University of Khorfakkan, Sharjah, UAE, University of Khorfakkan, Sharjah, UAE. Email: Esaaf.Hamad@ukf.ac.ae, ORCID: 0000-0002-2395-5315

Abstract

The research investigated the effect of AI-powered chatbots on crisis communication efficiency and trust-building in government public relations in the United Arab Emirates. It also explored the role of message customization in mediating this effect. The research relied on the descriptive analytical approach. A questionnaire was distributed to 360 public relations professionals in government institutions responsible for managing corporate communication during crises. The results revealed the need for incorporating AI-powered chatbots into corporate communication strategies. The data analysis indicated that the synergy of technology and communication efficiency can improve a corporation's performance and guarantee increased efficiency in managing a crisis. The research paper proposes the development of communication systems that incorporate chatbots in a strategic approach. This will help improve interactions with the citizens and provide precise and timely information in case of an emergency. The research also recommends greater investments in training public relations organizations to adopt AI technologies efficiently to ensure they are maximally exploited in governmental contexts.

Keywords: AI-powered chatbots, crisis communication efficiency, trust-building, government public relations, message customization

1. Introduction

Public relations (PR) helps institutions fulfill their goals, handle their reputation, and realize effective communication (Hermanses et al., 2024). It leads internal and external communication plans, especially during crises (Al-Jenaibi, 2022). Organizational crises can be detrimental without an appropriate communication plan (Loof et al., 2023). Communication is vital in emergencies to manage the mass opinion, convey the correct information, and provide immediate help. The Artificial Intelligence (AI)-based communication systems can process real-time data, convert complicated signals into meaningful information, and ensure that the most important messages are directed to the appropriate audiences in a timely and transparent manner (Davis, 2025). Chatbots gain more and more significance in crisis communication due to the reduction of misinformation and the availability of real-time data (Baaj et al., 2024). Researchers should investigate how to use communicative responses to safeguard reputations and gain trust and the different variables that can affect this relationship (Coombs & Holladay, 2002). Using chatbots for customization and personalization provides a scalable and adaptable framework for cultural tailoring. It has a significant impact on how friendly and trustworthy a chatbot is seen to be (Zhao et al., 2025).

When the crisis occurs, the information dissemination is supposed to be quicker, more frequent, and more efficient. Demand to deliver information to the public is also ever-deepening in the government during a crisis because the people

have something to say on how well the government has managed to communicate the issues. Since the onset of the current year, the "COVID-19 pandemic" has compelled governments to address a condition that integrates virology and virality, fast transmission of the virus, and information and misinformation that has led to panic among citizens (Depoux et al, 2020). Therefore, governments should identify a communication tool that can deliver information most straightforwardly and has already become part of people's lives. Cities and national governments worldwide have implemented AI-based chatbot technology. Compared to the vast amount of information that social media or web search engines would have, chatbots can offer responses to most questions concisely and credibly, and with a single answer. When COVID-19 occurred, all governments used AI-based chatbot technology to better communicate with the public about the need to wear a mask, avoid crowded places and social distancing, wash our hands under running water or apply hand sanitizer, and above all, stay at home as advised by the governments (Untari, 2020).

1.1 Problem Statement

Although "Arab public relations research has made significant strides since its beginning", no study has examined the body of existing literature to map the trends and patterns in the field (Alkathiri & Alharbi, 2024). Government public relations has been criticized for lacking theoretical development and remains a relatively unexplored area of public relations research compared to its corporate and nonprofit counterparts, despite the significance of public relations in local, national, and international government organizations (Dong et al., 2023). In the UAE, public relations professionals should use effective communication strategies to improve audience engagement and organizational reputation. Organizations can maximize their effectiveness by tailoring their communication strategies to the impact sizes and direct/indirect linkages (Alshanag et al., 2023). Despite extensive studies that have been conducted on the traditional response personnel, less attention has been given to nontraditional sources of message (Loof et al., 2023). Despite extensive research on AI's technical potential or organizational value, little research has been conducted on the actual customer experience with AI in an emergency (Ogbo & Oyana, 2024). Implementing and utilizing AI-driven chatbots in governmental PR has become critical, especially in crisis PR. Despite the possible advantages of this type of technology, such as instant information exchange and better productivity, its application in establishing popular trust is not the subject of investigation. In the UAE, where the digital revolution is a national concern, it is critical to consider how trust can be established in an emergency. Chatbots can be customized to that effect.

1.2 Research Objectives

The research investigated the effect of AI-powered chatbots on crisis communication efficiency and trust-building in government public relations in the United Arab Emirates. It also explored the role of message customization in mediating this effect.

1.3 Research Hypotheses

- "There is a statistically significant relationship between AI-powered chatbots and trust-building."
- "There is a statistically significant relationship between crisis communication efficiency and trust-building."
- "Crisis Communication Efficiency has a mediating role in the relationship between AI-powered chatbots and trust-building"
- "There is a statistically significant relationship between some AI-powered chatbots and message customization."
- "There is a statistically significant relationship between communication efficiency and message customization."
- "There is a role for communication efficiency as an intervening variable in the relationship between AI-powered chatbots and Message Customization."

1.4 Theoretical Frameworks

The "Situational Crisis Communication Theory (SCCT)" is built on the work of crisis management scholars. It depends on earlier research on crisis response strategies that are appropriate for the crisis. The crisis manager ought to choose a crisis response plan suitable for the potential harm a crisis could cause to one's reputation to gain trust (Coombs & Holladay, 2002; Whims, 2024). The idea of artificial intelligence in crisis management builds upon the current framework by adding AI technologies to improve efficiency and effectiveness. Through various methods, intelligent systems are used to improve every stage of crisis management as part of the integration of AI (Natarajan & Shammine, 2024). When examining how AI technologies are used in crisis communication, the Technology Acceptance Model (TAM) and its extensions, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), are pertinent for the concepts of perceived usefulness and perceived ease of use, among others. This can support crisis communication theories like SCCT and logically incorporate ways AI improves crisis responses (Ogbo & Oyana, 2024).

SCCT provides a conceptual framework for reviewing the impact of automated crisis responses on people's perception, trust, and the organization's reputation. Based on this theory, the paper will discuss the possibilities of the AI-mediated messages to recreate the strategic intent and emotional appeal of human crisis communication. Since the use of AI-driven chatbots to react to crises in real time continues to gain popularity among more organizations, it is time to evaluate how the technologies describe or do not describe the communication practices that SCCT suggests. This comparison will allow a better understanding of how consumers evaluate AI-generated responses to a crisis based on the desired empathy, responsibility, and sincerity, the main variables of stakeholder trust and post-crisis reputation restoration. In this manner, the SCCT implementation not only has the advantage of basing the research on the substantive theoretical tradition but also helps to develop the adaptive models of crisis communications that will be applied in the digital and AI-driven era.

1.5 Research Significance

The study is relevant to the knowledge of the most efficient communication structures with the introduction of AI chatbots into communication systems. It expands the already existing theory of communication, which is currently known as the "Situational Crisis Communication Theory (SCCT)", which is the human factor to crisis responses, by gauging the impact of crisis response communication mediated by AI. The paper analyzes how personalized messaging, one of the primary features of AI communication, affected communication and trust towards the audience. It also attempts to develop more effective communication response measures to crises by exploring the impact of message customization. This will help narrow down the theory frameworks that apply to trust, crisis communication, and message formulation, especially in the digital world. The relevance of the research is that the role of individualization and customization of messages increases, and the benefits of message customization with the help of AI are also increasing, as this method can create a more personal and empathetic connection with the audience, which enhances the effectiveness of crisis communications. Moreover, the study illuminates the potential implications of the research for the UAE and how the government uses digital technologies within the context of PR practices.

2. Literature Review

2.1 AI-Powered Chatbots for Crisis Communication Efficiency

Crises present a significant threat to the day-to-day activities of an organization (Loof et al., 2023). Crises are unforeseeable events that can affect the performance of an organization and damage its image (Coombs & Holladay, 2002). Crisis communication is the strategic process of delivering the timely, correct, and relevant information to the public, the stakeholders, and the media in case of emergencies, disasters, and other unexpected situations (Cate, 2023). Chatbots driven by artificial intelligence (AI) have become crucial tools that provide precise and prompt information (Branda et al., 2025). Chatbot AI refers to a computer program using artificial intelligence techniques, such as natural language processing (NLP), to simulate human dialogues, understand user questions, and respond with human-like, relevant content for a wide range of applications from general information to goal-oriented aid (Alvinger et al., 2025).

Chatbots are of immense importance in crisis communication since they can help organizations to act quickly and effectively upon the concerns of their customers in the face of disruption. In this case, AI-based chatbots can give real-time and personalized feedback, reducing delays, preserving information integrity, and protecting customer trust. They provide simple answers to simple questions on the spot, thus providing simple information in a responsive time, and establishing open dialogues with human operators in case such an issue could warrant empathy, emotional competency, or the ability to find a complex solution (Akande & Oyana, 2025; Xiao & Yu, 2025; Dambuza, 2025).

The effectiveness of the communication process through chatbots is associated with reducing the time required to prepare the responses and providing coherent and situational messages, which are channel-consistent. In fact, message tailoring results in trust in the stakeholders, particularly where tailored messages are perceived to be empathetic and believable, compared to generic messages. Nonetheless, in an improved system, there will be a need to use human elements to respond in real-time to issues associated with the workload, like what happens during a crisis, where ethical considerations, emotional tendencies, and culturally aware communication should be considered (Bastola et al., 2023). Examples of intelligent systems that can be used in this process are as follows:

− **Predictive Analytics**: AI algorithms analyze historical data, identify patterns, and incorporate real-time information to forecast possible crises and their consequences.

− **Automation of Routine Tasks**: Artificial intelligence can simplify diverse and repetitive work, such as data entry and report creation, and human resources can concentrate on more significant work.

− **Decision Support Systems:** Machine learning and optimization are applied to support crisis managers with decision support systems driven by artificial intelligence. These systems involve the organization of response operations, logistics, and resource distribution.

- **Real-Time Data Analysis:** A real-time data analysis system is an artificial intelligence system that examines a large volume of real-time data from diverse sources to deliver valuable information.

2.2 AI-Powered Chatbots for Trust-Building

By offering prompt, pertinent, and situation-oriented answers, AI chatbots assist organizations in efficiently addressing stakeholders' questions, which is essential in crisis or sensitive communication situations. The fact that these chatbots can be customized makes them more interactive and adds a more real voice, thus leading to a more favorable relationship of trust with the population (Pantic & Lindahl, 2025).

Unlike one-way communication, chatbots are capable of two-way communication and feedback in real time or at any time and in an accurate or personalized way. Thus, AI-based chatbots are systems of credibility and can even make government transactions appear more human and closer to people (Shukla, 2025).

A conversational chatbot can help build trust by considering integrity, competence, predictability, and benevolence, and demonstrating human management to ensure people feel comfortable. Placed strategically, chatbots offer relevant and coherent information on time, help establish positive attitudes towards organisational responsibility, and support long-term relationships between organisations and the population (Rollerson, 2023).

Organizational PR chatbots are trust-building devices whose communication style is vital to user attitudes. Research indicates that spontaneous and emotionally intense language enhances humanness, social presence, and authenticity perceptions, and this is transferred into trust in chatbot interactions (Eliasson & Engström, 2025).

The credibility of public relations chatbots is gradually founded upon how the audiences perceive that the chatbot can speak to them naturally and personally. The quality of interaction, social presence, and tone of conversation are essential in determining the extent of trust, satisfaction, and commitment to the organization. When prompted to speak naturally and build a sense of presence, chatbots allow for closer relationships and instill confidence in the institution (Chanda, 2024).

Even though the use of chatbots contributes significantly to the speed and accuracy of responding to a crisis, the lack of human ability to fully reflect the complexity of human feelings and ethical nuance ensures that the role of humans will always be critical. Chatbots are therefore best considered as supplementary tools, such as enhancing efficiency and consistency in crisis messages, whereas human professionals can perform better in the areas of empathy, moral judgement, and building a long-term relationship with stakeholders (Whims, 2024; Ogbo & Oyana, 2024).

2.3 Message Customization

Customization of the message is an important PR activity that promotes the quality of the message and outlines the interrelationship between the people and institutions. Customization of media messages based on the interests, needs, and expectations of the population can ensure that organizations can maximize the engagement of audiences, comprehending, and trusting the information generated. Governmental managers, in particular, use new practices like active online content, instructional campaigns, and imaginative virtual initiatives to address citizens, attract their attention, and convey short messages (Tharwat, 2025).

Customizing chatbot messages has been a fundamental aspect of developing organization-public relations, surpassing utilitarian functionality, and addressing relational efficacy in PR. Studies indicate that the message delivery of chatbots, such as personalized verbal and non-verbal cues, conversational tone, and responsiveness, is more important in creating trust, the sense of listening, and interactions than visual design or anthropomorphic profile (Zhou et al., 2024).

Chatbot messages should always be personalized when communicating with customers during a crisis to affect customers' perception and prevent harm that mistakes in the automated dialogue may cause. Although chatbots are affordable devices that react immediately to crises, any mistakes they make in the communication process may negatively impact the brand attitude and service satisfaction. Studies have shown that personalized responses, including how a chatbot presents itself to establish realistic expectations and communicates messages in an accommodating rather than defensive response form, come in handy in enabling organizations to manage user responses more efficiently (Niessen, 2022; Loof et al., 2023).

As Haddad and Sattarian (2024) emphasize, although AI can significantly enhance customer service and improve personalization, its use can also be dangerous, such as eliminating human interaction and raising data privacy issues. Whims (2024) shows that, despite AI being a valuable instrument in processing data and establishing an initial contact, the human expertise in interpreting emotional signals and making morally appropriate decisions will not be substituted. It is necessary to consider AI as an addition to the crisis communication strategies implemented by humans, enabling quicker and more efficient responses, but with human supervision.

3. Field Research Procedures

3.1 First: Methodology

The research relied on the descriptive analytical approach, which Al-Rafii and Al-Raqas (2014, p. 13) defined as "the basis for the systematic description of the facts and characteristics related to a specific phenomenon or problem in a scientific and precise manner. It is based on identifying the phenomenon's characteristics, describing its nature, the type of relationship between its variables, its causes, its trends, and other aspects that revolve around exploring the depths of a specific problem or phenomenon and identifying its reality on the ground. The descriptive analytical approach also goes beyond merely collecting, manufacturing, measuring, and extracting results from data. Descriptive analytical research is based on several foundations, such as abstraction and generalization." The time framework of the study is cross-sectional and confined to the period of distributing the questionnaire and collecting responses in 2025.

3.2 Second: Participants

The study community includes executive directors, communications teams, and crisis management experts. The researcher used a purposive sampling of 360 employees, considering diversity in practical experiences, job positions, and levels of participation in crisis communication tasks. The sample was designed to accurately represent the prevailing practical reality in government institutions, enabling the extraction of results that can be generalized across the study population. It also ensures the researcher's ability to analyze the relationship between intelligent robots, communication efficiency, and trust building, considering the role of message personalization as an intervening variable.

3.3 Third: "Characteristics of the Research Sample"

Frequencies and percentages of general information for the study sample individuals, which is represented by demographic information including (academic qualification, years of experience, age group, and type of educational institution), were calculated as follows:

Table 1. Distribution of sample individuals according to their characteristics

"Gender"	Frequencies	percentages
"Male"	252	70%
"Female"	108	30%
"Total"	360	100%
"Academic Qualification"	Frequencies	percentages
"Bachelor's"	227	63.1%
"Master's"	113	31.4%
"PhD"	20	5.6%
"Total"	360	100%
"Number of Years of Experience"	Frequencies	percentages
"Less than 5 years"	159	44.2%
"5 to 10 years"	102	28.3%
"More than 10 years"	99	27.5%
Total	360	100%

3.4 Fourth: Research Tool

The researcher constructed a questionnaire to reveal the Effect of "AI-powered chatbots" on Crisis Communication Efficiency and Trust-Building in Government Public Relations: Mediating Role of Message Customization. Its validity and reliability were confirmed in many ways, such as the validity of the arbitrators, as the questionnaire was sent to the arbitrators to judge the linguistic formulation, clarity, and the extent to which the statements belonged to the questionnaire. Some statements in the questionnaire were deleted and reformulated, as agreed upon by more than 80% of the arbitrators. Thus, the questionnaire in its final form after arbitration consisted of (39) statements distributed over (4) axes. The five-point Likert scale (strongly disagree, disagree, somewhat agree, agree, strongly agree) was used to correct the research tool (questionnaire), giving the response: strongly disagree (1), disagree (2), somewhat agree (3), agree (4), strongly agree (5). The validity of the internal consistency of the questionnaire was also confirmed by applying it to a sample. A survey of (30) items was conducted, and the results were as follows:

−   The first axis: "AI-powered chatbots, and the internal consistency validity of the first axis was confirmed, as the internal consistency validity was calculated by calculating the Pearson correlation coefficient between the scores of each statement and the total score of the axis to which the statement belongs in the questionnaire, as the correlation coefficients came with high values and ranged between (.731**-.895**), and all of them were statistically significant at a significance level of (0.01). The general structural validity of the dimensions of the first

axis was also verified by finding the correlation coefficients of the dimensions with the total score of the axes, as they ranged between (.838**-.943**), and all of them were statistically significant at a significance level of (0.01)".

– The second axis: "Crisis Communication Efficiency, and the validity of the internal consistency of the second axis was confirmed, as the validity of the internal consistency was calculated by calculating the Pearson correlation coefficient between the scores of each statement and the total score of the axis to which the statement belongs in the questionnaire, as the correlation coefficients came with high values and ranged between (.806**-.877**), and they were all statistically significant at a significance level of (0.01)".

– The third axis: "Trust-Building, and the internal consistency validity of the third axis was confirmed, as the internal consistency validity was calculated by calculating the Pearson correlation coefficient between the scores of each statement and the total score of the axis to which the statement belongs in the questionnaire, as the correlation coefficients came in high values and ranged between (.745**-.851**), and all of them were statistically significant at a significance level of (0.01)".

– The fourth axis: "Message Customization. The internal consistency validity of the fourth axis was confirmed, as the internal consistency validity was calculated by calculating the Pearson correlation coefficient between the scores of each statement and the total score of the axis to which the statement belongs in the questionnaire, as the correlation coefficients came in high values and ranged between (.714**-.831**). They were all statistically significant at a significance level of (0.01)".

3.4.1 The Reliability of the Tool (Questionnaire) Was as Follows

– First axis reliability: "AI-powered chatbots"

Cronbach's Alpha was used to measure the reliability of the dimensions of the first axis: "AI-powered chatbots", and the results are shown in the following table:

Table 2. Cronbach's alpha reliability coefficients for the dimensions of the first axis: AI-powered chatbots

No.	dimensions	Cronbach's alpha
1	First dimension: Efficiency	0.930
2	Second dimension: Intelligence	0.775
3	Third dimension: Availability	0.798
	Overall reliability coefficient	0.888

"The previous table shows that the reliability coefficient values for the dimensions of the first axis: AI-powered chatbots, came in at high values, ranging between (0.775-0.930), and the Overall reliability coefficient value reached (0.888); these reliability coefficient values indicate the validity of the first axis of the questionnaire for application and the possibility of relying on and trusting its results".

– Second Axis Reliability: Crisis Communication Efficiency

Cronbach's Alpha was used to measure the reliability of the statements of the second axis: Crisis Communication Efficiency, and the results are shown in the following table:

Table 3. Cronbach's alpha reliability coefficients for the statements of the second axis: Crisis Communication Efficiency

No.	statements	Cronbach's alpha
16	Chatbots contribute to the rapid delivery of information during a crisis.	0.932
17	Reduces errors during crisis communication.	0.928
18	Improves information coordination between government agencies.	0.930
19	Facilitates efficient management of critical situations.	0.930
20	Increase emergency response speed.	0.930
21	Provides accurate information during crises.	0.928
22	Limits duplicate messages or misinformation.	0.930
23	Enhances the organization of the communication process during a crisis.	0.925
	Overall reliability coefficient	0.938

The previous table shows that the values of the reliability coefficients for the statements of the second axis: Crisis Communication Efficiency, came in at high values, ranging between (0.925-0.932), and the value of the Overall reliability coefficient reached (0.938); these values of the reliability coefficients indicate the validity of the second axis of the questionnaire for application and the possibility of relying on and trusting its results.

- Third axis reliability: Trust-Building

Cronbach's Alpha was used to measure the reliability of the statements of the third axis: Trust-Building, and the results are shown in the following table:

Table 4. Cronbach's alpha reliability coefficients for the statements of the third axis: Trust-Building

No.	statements	Cronbach's alpha
24	Chatbots increase public trust in government institutions.	0.922
25	Provides transparent and accurate information.	0.924
26	Improves the credibility of official messages.	0.917
27	Provides reliable communication with the audience.	0.915
28	Promises commitment to the promise and the information provided.	0.917
29	Contributes to building a positive relationship with users.	0.917
30	Reduces audience doubts or fears.	0.915
31	Supports the positive image of the government agency through intelligent interaction.	0.919
	Overall reliability coefficient	0.928

The previous table shows that the values of the reliability coefficients for the statements of the third axis: Trust-Building, came in at high values, ranging between (0.915-0.924), and the value of the Overall reliability coefficient reached (0.928); these values of the reliability coefficients indicate the validity of the third axis of the questionnaire for application and the possibility of relying on and trusting its results.

- Fourth axis reliability: Message Customization

Cronbach's Alpha was used to measure the reliability of the statements of the fourth axis: Message Customization. The results are shown in the following table:

Table 5. Cronbach's alpha reliability coefficients for the fourth axis statement: Message Customization

No.	Statements	Cronbach's alpha
32	The chatbot delivers personalized messages to each user.	0.884
33	Adjust message content to suit audience needs.	0.897
34	Takes into account the user's cultural and social background.	0.889
35	Customizes recommendations based on the type of inquiry.	0.895
36	Allows messages to be automatically modified based on the situation.	0.887
37	Increases communication effectiveness through personalization.	0.889
38	Enhance message understanding among the target audience.	0.897
39	Improves response to critical situations through personalized messages.	0.889
	Overall reliability coefficient	0.903

The previous table shows that the values of the reliability coefficients for the statements of the fourth axis: Message Customization, came in at high values, ranging between (0.884-0.897), and the value of the Overall reliability coefficient reached (0.903); these values of the reliability coefficients indicate the suitability of the fourth axis of the questionnaire for application and the possibility of relying on and trusting its results.

3.5 Fifth: "Statistical Methods"

In light of the study's objectives, questions, and hypotheses, a set of appropriate statistical methods was used to verify the validity of the hypotheses and test the relationships between the variables. Descriptive statistics were initially used to calculate means and standard deviations and describe the trends of the sample individuals' responses towards the study dimensions. Pearson's correlation coefficient was also employed to measure the strength and direction of the relationship between the independent variables (such as the dimensions of "AI-powered chatbots") and the dependent variables (such as Trust-Building and Message Customization), in order to verify the validity of the correlational hypotheses. Path analysis was relied upon through the simple mediation model using the PROCESS tool, version 5, in the SPSS program, according to Model No., to analyze the hypotheses related to the presence of a direct and indirect effect. (4), which is used to test the effect of the mediating variable (Crisis Communication Efficiency) on the relationship between the independent and dependent variables. The Bootstrap method was also used with 5,000 samples to test the significance of the indirect effect and relied on 95% confidence intervals to determine the extent of the mediation significance. These methods showed accurate results. Reliable and supported the hypotheses and clarified the nature of the relationships between the study variable".

4. Presentation of Research Results

The first hypothesis, "There is a statistically significant relationship between 'AI-powered chatbots' (Efficiency-Intelligence-Availability) and Trust-Building." To verify the validity of the hypothesis, Pearson's correlation coefficient was used to determine the nature of the statistical relationship between the "AI-powered chatbots" (Efficiency-Intelligence-Availability), as well as the "AI-powered chatbots" variable as an independent variable, and the "Trust-Building" variable as a dependent variable. A significance level of 0.01 was used for this.

Table 6. Correlation coefficients between AI-powered chatbots and Trust-Building dimensions

Dimension/Variable	The symbol	Correlation coefficient with Trust-Building (BBXX)	Significance level Sig. (2-tailed)	Statistical significance
Efficiency	AA1	0.486**	0.000	Significant at 0.01
Intelligence	AA2	0.496**	0.000	Significant at 0.01
Availability	AA3	0.480**	0.000	Significant at 0.01
"AI-powered chatbots"	AAXX	0.490**	0.000	Significant at 0.01

The correlation matrix outputs indicate a strong, statistically significant positive correlation between the AI-powered chatbot components and trust building. Competence achieved a correlation value of 0.486, intelligence and understanding recorded 0.496, and availability recorded 0.480, all significant at the 0.01 level. This suggests that these relationships are not random and indicates a real impact of these factors on establishing trust in the government framework. Furthermore, the overall correlation for the independent variable shows a value of 0.490, confirming the overall positive role of "AI-powered chatbots" in enhancing public trust in government agencies.

The robot's high intelligence and knowledge allow it to respond correctly and quickly to each question. This minimizes doubts and inaccuracy and enhances the believability of the official messages. Third, the robot's 24/7 functionality means that the public has access to information at all times, which is necessary in creating trust, particularly in an emergency where timely information is paramount.

The second hypothesis is, "There is a statistically significant relationship between Crisis Communication Efficiency and Trust-Building." To verify the accuracy of this hypothesis, Pearson correlation was used to estimate the strength and direction of the correlation between the variable "Crisis Communication Efficiency" (DQXX) and the variable "Trust-Building" (BBXX). This was done at a significance level of 0.01 and a two-tailed test.

Table 7. Correlation coefficient between Crisis Communication Efficiency and Trust-Building

The first variable	The symbol	The second variable	The symbol	Correlation coefficient (r)	Sig. (2-tailed)	Statistical significance
Crisis Communication Efficiency	DQXX	Trust-Building	BBXX	0.134**	0.000	Significant at 0.01

Table 7 indicated a moderate positive and strong direct combination between communication efficiency and message customization, with a significant statistical significance at 0.01. The correlation coefficient was (r = 0.472) and the statistical significance (Sig. = 0.000). It implies that the higher the communication efficiency is, the higher the possibility of creating tailored messages that can meet the needs of the target groups or recipients. This connection is justified by the fact that efficient communication helps to comprehend better what is required by the recipient and makes it possible to make proper and efficient changes to the content of messages and their delivery methods.

The third hypothesis, "Crisis Communication Efficiency has a mediating role in the relationship between AI-powered chatbots and trust-building." To verify the accuracy of the hypothesis, the simplest mediation model (Model 4) was adopted using the PROCESS v5 tool designed by Andrew F. Hayes within SPSS. The bootstrap method was used with 5,000 replications and a 95% confidence level. The purpose of this analysis is to examine whether crisis communication efficiency mediates the relationship between the independent variable ("AI-powered chatbots") and the dependent variable (trust-building). This is done by analyzing three main paths:

- First path (a): The effect of "AI-powered chatbots" on crisis communication efficiency.
- Second Path (b): The effect of crisis communication efficiency on trust building.
- Direct Path (c'): The effect of "AI-powered chatbots" on trust building after introducing the mediating variable.
- Indirect Path (ab): Calculated by multiplying (a × b).

Table 8. First Path Analysis (Impact of AI-powered chatbots on Crisis Communication Efficiency)

Independent variable	The symbol	B (impact)	Se (standard error)	T	Sig. (p)	95% confidence limits (llci – ulci)	Statistical significance
"AI-powered chatbots"	AAXX	0.2573	0.0360	7.15	0.000	[0.1865 – 0.3281]	Significant at 0.01
(constant)	—	2.6508	0.1230	21.55	0.000	[2.4088 – 2.8927]	Significant at 0.01

First path analysis data showed that chatbots, powered by AI, have a positive and statistically significant impact on the effectiveness of crisis communication. The impact coefficient was (0.2573), with a t-value of (7.15) and a statistical significance level of (0.000), indicating the significance of this impact at the (0.01) level. Furthermore, the (95%) confidence interval, which lies between (0.1865 - 0.3281), does not contain zero, confirming this impact's strength and statistical persistence.

Additionally, the constant, which is equal to (2.6508), with a statistical significance level of "f" equal to (0.000), indicates a baseline level of communication efficiency during crises even in the absence of the use of intelligent robots, reflecting the complementary role this technology plays in supporting performance rather than completely traditional solutions. Based on these results, the importance of integrating intelligent robots into organizations' crisis management plans becomes clear. They help improve the quality and speed of communication, which supports Trust-Building between the organization and the public, and increases teams' preparedness level to deal with difficult situations more effectively.

Table 9. Second Path Analysis (Impact of AI-powered chatbots and Crisis Communication Efficiency on Trust-Building)

independent variable	The symbol	(B) Impact	(SE) Standard Error	t	Sig. (p)	95% confidence limits (LLCI – ULCI)	Statistical significance
"AI-powered chatbots"	AAXX	0.5159	0.0503	10.27	0.000	[0.4171 – 0.6147]	Significant at 0.01
Crisis Communication Efficiency	DDXX	-0.0624	0.0690	-0.90	0.366	[-0.1981 – 0.0733]	Not significant
(constant)	—	1.9008	0.2435	7.81	0.000	[1.4219 – 2.3796]	Significant at 0.01

The previous table shows that "AI-powered chatbots" have a direct, strong, and positive effect on trust building (B = 0.5159, p < 0.01). In contrast, crisis communication competence does not appear to significantly affect trust building (B = -0.0624, p = 0.366), which reduces the possibility of a mediating role in this effect.

Table 10. Indirect Effect Analysis (Crisis Communication Efficiency Mediation)

Indirect Path	B (indirect effect)	Boot SE	Boot LLCI	Boot ULCI	Does it contain zero?	Conclusion
AAXX → DDXX → BBXX	-0.0161	0.0213	-0.0607	0.0248	Yes	The effect is not significant.

Since the bootstrap confidence interval contains zero, the indirect effect of "AI-powered chatbots" on Trust-Building via Crisis Communication Efficiency is not statistically significant, indicating that Crisis Communication Efficiency cannot be considered an influential mediator in this relationship.

Based on the above, it is clear that Crisis Communication Efficiency does not represent a statistically significant mediating variable in the relationship between "AI-powered chatbots" and Trust-Building, despite the presence of a substantial direct effect of "AI-powered chatbots" on Trust-Building.

The fourth hypothesis, "There is a statistically significant relationship between some AI-powered chatbots (Efficiency-Intelligence-Availability) and Message Customization." To verify the validity of the hypothesis, the "Pearson Correlation Coefficient" was used to evaluate the correlation between: "AI-powered chatbots" (Efficiency, Intelligence, and Availability) added to the combined "AI-powered chatbots" variable, and "Message Customization," at a significance level of 0.01.

Table 11. Correlation coefficients between "AI-powered chatbots" and Message Customization dimensions

Dimension/Variable	The symbol	Correlation coefficient with Message Customization (CCXX)	Significance level Sig. (2-tailed)	Statistical significance
Efficiency	AA1	0.212**	0.000	Significant at 0.01
Intelligence	AA2	0.215**	0.000	Significant at 0.01
Availability	AA3	0.214**	0.000	Significant at 0.01
"AI-powered chatbots"	AAXX	0.215**	0.000	Significant at 0.01

"The results showed statistically significant positive relationships at the 0.01 level between the dimensions of "AI-powered chatbots" (efficiency, intelligence, availability) and message personalization, with correlation coefficients ranging from 0.212 to 0.215, while the overall correlation coefficient between "AI-powered chatbots" and message personalization was 0.215. This relationship is justified because the bot's efficiency positively affects the speed of response and the possibility of giving appropriate information. In any case, bots are able to measure the needs of the audience and pinpoint the most appropriate content.

The fifth hypothesis, "There is a statistically significant relationship between Communication Efficiency and Message Customization." To verify the validity of the assumption, Pearson's Correlation Coefficient was used to evaluate the

relationship between the communication efficiency variable (DDXX) and the message customization variable (CCXX), at a significance level of 0.01, two-tailed.

Table 12. Correlation coefficient between Communication Efficiency and Message Customization

The first variable	The symbol	The second variable	The symbol	Correlation coefficient (r)	Sig. (2-tailed)	Statistical significance
Communication Efficiency	DDXX	Message Customization	CCXX	0.472**	0.000	Significant at 0.01

The data in Table 7 showed a moderate and strong direct relationship between communication efficiency and message customization, with a significant statistical significance at the 0.01 level. The correlation coefficient reached (r = 0.472), with a statistical significance (Sig. = 0.000). This means that the more communication efficiency is enhanced, the greater the ability to design customized messages that suit the requirements of the target groups or recipients.

The data in Table 7 showed a moderate and strong direct relationship between communication efficiency and message customization, with a significant statistical significance at the 0.01 level. The correlation coefficient reached (r = 0.472), with a statistical significance (Sig. = 0.000). This means that the more communication efficiency is enhanced, the greater the ability to design customized messages that suit the requirements of the target groups or recipients.

This relationship can be explained by the fact that effective communication enables a deeper understanding of the recipient's requirements and facilitates more accurate and effective modification of message content and delivery methods.

The sixth hypothesis: "There is a role for Communication Efficiency as an intervening variable in the relationship between AI-powered chatbots and Message Customization." To verify the validity of the hypothesis, the mediation model, defined as (Model 4), was relied upon within the PROCESS program, version 5 of SPSS, with the following data entered:

1. Independent variable (X): "AI-powered chatbots" (AAXX)

2. Moderator variable (M): Communication efficiency (DDXX)

3. Dependent variable (Y): Message personalization (CCXX)

This analysis used a bootstrap replication method with 5,000 iterations and a 95% confidence level. It examined whether communication efficiency mediates the relationship between "AI-powered chatbots" and message personalization.

Table 13. First Path Analysis (AAXX → DDXX) Impact of AI-powered chatbots on Crisis Communication Efficiency

independent variable	The symbol	(B) Impact	SE	t	Sig. (p)	95% confidence limits (LLCI – ULCI)	Significance
artificial intelligence	AAXX	0.2573	.0360	7.15	0.000	[0.1865 – 0.3281]	Significant at 0.01

The above table shows a statistically significant positive correlation between the use of "AI-powered chatbots" and the effectiveness of crisis communication. This means that developing these technologies significantly enhances the effectiveness of crisis communication employed and implemented in decision support systems.

Table 14. Second Path Analysis (AAXX + DDXX → CCXX) Impact of AI-powered chatbots and Crisis Communication Efficiency on Message Customization

variable	The symbol	B	SE	t	Sig.	LLCI	ULCI	Significance
"AI-powered chatbots"	AAXX	0.0416	.0378	1.10	.271	-0.0327	0.1159	Not significant
Crisis Communication Efficiency	DDXX	0.4721	.0519	9.10	.000	0.3700	0.5741	Significant at 0.01

The previous table shows that after including "crisis communication competence" as a mediating variable, the direct relationship between "AI-powered chatbots" and "message personalization" lost its statistical significance. In contrast, "crisis communication competence" maintained its significant and significant effect on "message personalization." This pattern of results suggests the possibility of mediation.

Table 15. Indirect effect analysis (mediation) Mediation analysis via Bootstrap

The path	(Effect)	Boot SE	Boot LLCI	Boot ULCI	Significance
AAXX → DDXX → CCXX	0.1215	0.0246	0.0754	0.1703	Significance
Path (standardized)	Effect	BootSE	BootLLCI	BootULCI	Interpretation
StandYX Indirect Effect	0.1601	0.0301	0.1021	0.2194	Significance– Existing mediation

The results of the indirect effect analysis revealed a statistically significant and positive mediation of the path of the impact of "AI-powered chatbots" (AAXX) on message personalization (CCXX) via communication efficiency (DDXX). The indirect effect was 0.1215, with a standard error (boot SE) = 0.0246, and a 95% confidence interval (CI) of [0.0754 – 0.1703], confirming the presence of statistical significance, as the CI does not include zero.

Additionally, the standardized path (Stand YX Indirect Effect) showed a value of 0.1601 with Boot SE = 0.0301 and a 95% confidence interval of [0.1021 – 0.2194], supporting the presence of mediation, whether partial or complete. This implies that the effectiveness of AI-powered intelligent bots in improving the personalization of messages to organizations depends heavily on the effectiveness of communication. The outcomes of the past studies justify this relationship (Tharwat, 2025; Zhou et al., 2024; Loof et al., 2023). Natarajan and Shammine (2024) verify that AI applications such as chatbots and automated messaging systems enhance communication with stakeholders and other people in general since they effectively oversee the sharing and disclosure of relevant information, respond to questions, and promptly disseminate information.

5. Summary of Results

It was found that the positive relationship between communication efficiency and trust building was statistically significant (Rollerson, 2023; Chanda, 2024; Eliasson & Engstrom, 2025). Even though the strength of this relationship was also rather weak, it can be explained by the impact the trust had on the other aspects, i.e., the leadership and transparency of the organization and past experience of the population. This constrains the effects of communication effectiveness on trust, yet it is still significant. Coombs and Holladay (2002) affirm that researchers ought to explore the ways in which communicative response can be applied to protect reputations and earn trust during crises and the various variables that may influence this association. Bootstrap mediation analysis revealed that intelligent bots and communication efficiency are connected significantly through a mediator, which is the message personalization. It implies that the positive effects of innovative technologies on the personalization of the message will be more significant in the case of practical and structured communication, which proves the central importance of communication efficiency in extracting the most significant benefits of modern technologies. By enabling the integration of automation and human factors, an organization can maximize customer satisfaction, more effectively manage crisis response operations, and become more resilient (Akande and Oyana, 2025). Moreover, during emergencies when numerous individuals need information simultaneously, chatbots are able to handle numerous interactions simultaneously. Due to this reason, chatbots no longer serve as channels but represent businesses in their communication with stakeholders (Xiao & Yu, 2025). According to Dambuza (2025), the use of machine learning (ML), natural language processing (NLP), and sentiment analysis to improve chatbot response can assist in supporting individuals during a crisis with both emotional and informational assistance.

6. Ethical Considerations

The Principles of rigorous scientific research are applied in this Research, as the ethical aspects of data collection, analysis, and use are considered. The researcher also informed the participants of the study objectives and importance before getting their informed consent, further stating that participation was voluntary and could be canceled without any repercussions. The concepts of confidentiality and privacy were also upheld, since no names or personal information that could assist in identifying participants were mentioned during the processing of the data, and thus, full confidentiality was guaranteed. Moreover, the researcher did not want to hurt the participants and thus, made sure that the research tool was designed not to harm their psychological wellness or burden them.

7. Conclusion

Chatbots have the ability to customize messages to suit citizens' needs, establish relationships due to mutual understanding and credibility, enhance trust among the people, and enhance engagement. The results also indicated that the efficiency of communication is a key element that determines the success of such technologies and assists the government institutions in accomplishing their communication objectives more effectively. The findings also revealed that the effectiveness of communication is a significant factor that defines the success of such technologies and helps government institutions to achieve their communication goals more efficiently. When it comes to further research, extensive research should be carried out to investigate how intelligent chatbots can influence the behavior and reaction of the population during the crisis, taking into account the cultural and social background, which might influence the effectiveness of the provided technologies in Arabic settings. The second recommendation is that the area of research must be extended to other sectors, such as education, healthcare, and public services, to assess the applicability of the research findings and whether artificial intelligence can be used to increase the efficiency of the communication process in other areas.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Redfame Publishing.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

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