

Review

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EVALUATING MODERN TECHNOLOGIES AND PRACTICES FOR STRENGTHENING ORGANIZATIONAL CRISIS PREPAREDNESS

Assoc. prof. Davor Labaš, PhD¹**ABSTRACT**

Organizations have recently experienced increased risks due to political, technological, social, legislative, and environmental volatility. Accordingly, effective management should strive to enhance crisis prevention and preparedness activities that mitigate risks and strengthen organizational resilience and response capabilities. Modern crises challenge traditional crisis management preparedness approaches and decision making, ranging from modes of collaboration and application of emerging technologies to needs for real-time information sharing and ways of adequately addressing stakeholders. Hence, this research aims to assess the effectiveness and challenges of modern tool use and provide an overview of activities and approaches that organizations can employ in their modern crisis preparedness and resilience strengthening strategies. Secondary data from relevant scientific and professional sources was used. Findings indicate that a proactive communication approach, collaboration, innovation, and digital transformation shape the current effective crisis management. Research limitations include the application of secondary data and the extent of available, relevant literature. This research provides insights towards a more comprehensive understanding of crisis preparedness and crisis management literature, as well as provides benefits to organizations by highlighting key trends.

KEY WORDS: crisis management, organizational crisis preparedness, organizational resilience, crisis prevention, risks

JEL CLASSIFICATION: M10, H12, L20

1. Introduction

The business environment is increasingly becoming more uncertain and volatile. Crises can be global and complex, ranging from climate change and pandemics to cyber attacks. Business leaders are facing increasing challenges in managing in turbulent environments, as well as appropriately responding to internal organizational needs (PwC, 2023). As the World Economic Forum (2025) outlines in The Global Risks Report 2025, the most significant global risks that

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can also cause harm to business activities and planning include state based armed conflicts, extreme weather events, geoeconomic confrontations, and the spread of misinformation and disinformation. Similarly, Allianz Commercial (2025), in its Allianz Risk Barometer, identified the key business risks for 2025 through a global survey of risk management experts across various industries. Major risks include cyber incidents, business interruptions, natural disasters, legislative and regulatory changes, and climate change. Furthermore, KPMG International (2024), in its Top Risks Forecast 2024, highlighted crucial global challenges stemming from geopolitical risks, trade policy restrictions, and the growing need for effective AI governance.

Climate change constitutes a prime global risk, as it has a significant impact on businesses across the world. Extreme weather and its associated natural disasters can cause infrastructure damage, as well as cause harm to people. Repercussions can be manifested through increased regulatory and legal pressures and an organization's increased supply chain risks. Hence, risk assessment and scenario analysis can provide needed insights on climate related challenges and enable better preparedness (Cox et al., 2022). Climate changes amplify the natural disasters occurrence and impact of consequences for the organizations. Such reality requires improvements in crisis preparedness and enhanced mitigation possibilities (Krichen et al., 2024). The Swedish municipalities climate risk management case serves as an increasing example of community oriented resilience building activities. The goal is to effectively manage risks and be better prepared for crises, whereas climate change and its complexity of potential manifestations are not yet fully comprehended (Lidskog and Rabe, 2022). Accordingly, climate risk perception should be dealt with at a strategic level and considered as one of the key business risks in the long term (Zurich Insurance Group, 2024). Climate change and the expected rise of extreme weather events require new means and methods for strengthening emergency planning and preparedness, whereas improved resilience can lead to the mitigation of risks and fewer emergency response situations (Arnell, 2022).

According to Aon (2025), in its Global Risk Management Survey: Key Findings, based on responses from industry experts, cyber attacks and data breaches, business interruptions, economic slowdown or slow recovery, failure to attract or retain top talent, and regulatory or legislative changes have been identified as the biggest risks. Considering the presented global survey results, macroeconomic and geopolitical conditions significantly influence the global business risks ranking, whereas contemporary risks are increasingly more complex. Regarding risk readiness, the report indicates that, across the top 10 identified risks, an average of 60% of respondents considered their organizations risk-ready and adequately prepared. Accordingly, there is a continuous need for investments in and development of crisis preparedness to reduce the negative effects of crisis. Hence, effective management should strive to enhance crisis prevention and preparedness activities that mitigate risks and strengthen organizational resilience and response capabilities. When risk management is successfully built into an organization's strategy and daily operations, it helps handle potential threats and supports a competitive edge in a constantly shifting environment. To gain that advantage, it is also important to create a strong and resilient organizational culture that can withstand times of crisis (Elahi, 2013).

Modern crises challenge traditional crisis management preparedness approaches and decision making, ranging from modes of collaboration and application of emerging technologies to needs for real-time information sharing and ways of adequately addressing shareholders. Therefore, an understanding of technological capabilities and advancements is necessary for effective contemporary crisis management, whereas the use of tools presents a necessity and a challenge at the same time. This research assesses, through the use of the latest relevant scientific and professional sources, the effectiveness and challenges of modern tool use and provides an overview of activities and approaches that organizations can employ in their contemporary crisis preparedness and resilience-strengthening strategies.

To address the latest findings and trends in crisis management, especially from the aspect of technology and digital transformation, the key research questions in this paper are: 1) What are the contemporary main activities, technologies, and AI applications used in crisis management? 2) What are the main emerging crisis management technologies and activity trends?

Secondary data from relevant scientific and professional sources was used, with the focus on the last five years due to the rapid advancements in the field and the goal to provide and assess the latest academic and professional literature findings and knowledge.

Findings provide insights towards a more comprehensive understanding of crisis preparedness and crisis management literature, as well as provide benefits to organizations and their decision makers by highlighting key trends.

The remainder of this paper is organized as follows: Section 2 defines key concepts of organizational crisis preparedness, readiness, and resilience. Section 3 presents methodology, while Section 4 provides an overview and analysis of contemporary and emerging technologies use and activities in crisis management. Section 5 presents and discusses the challenges of technologies and activities implementation in crisis management. Section 6 presents analyzed results and their applicability, whereas section 7 presents the conclusion of the paper.

2. Literature overview and defining key concepts

Organizational crisis preparedness can be viewed as an ability to prepare for, adjust to, and thrive from a crisis (Rousaki and Alcott, 2007). Having crisis prevention plans as part of organizational crisis preparedness activities decreases employees perception of known risks and possibilities of escalating into a crisis (Selart et al., 2013). It includes usual activities such as scenario planning, standardization of activities, and formal organizational structure aimed at minimizing the possibility of the occurrence and the impacts of a potential crisis on the organization, while accordingly improving agility and flexibility (Klyver and Nielsen, 2024). Crisis preparedness has subsequently evolved and goes beyond precrisis plans and training, where it includes strategies for developing organizational resilience, with a strong anticipatory focus towards strategies and decision making, along with a significant impact of leaders personal engagement (Jin et al., 2024). Klyver and Nielsen (2024) have found that SMEs that are crisis prepared perform better in times of crisis and have stated that crisis management needs to be assessed in a holistic way, including and connecting all its phases for it to be more effective. However, even though crisis preparedness and its activities are largely understood

to be significant for effective crisis management, they are often neglected in business practice (Hede, 2017). Two-way internal communication is essential for the effective implementation of organizational crisis preparedness, as it fosters dialogue with employees who are crucial for strengthening crisis readiness (Zeng et al., 2024).

The crisis readiness goal is to avoid and mitigate crises (Parnell, 2021). According to the Crisis Communication Think Tank (CCTT) model, readiness is identified as an important aspect of future crisis management, where it is viewed as a proactive task and the beginning of planning activities (Jin et al., 2024). Björck et al. (2024) describe crisis readiness as an ongoing effort on the organizational level that weaves together appropriate corporate culture, strategic planning, and communication. When compared to crisis preparation, readiness is the willingness and mindset of people to mentally engage in dealing with crisis (it includes concepts such as focus on dynamic agility, efficiency, cognitive flexibility, and emotional leadership style of managing), whereas preparation refers to activities that, through practice, planning, training, and skill development, lead to a better possibility to respond in times of crisis (Jin et al., 2024). Furthermore, agile describes an approach to work that accepts change and aims to improve accordingly. Organizations that have adopted agile methods and processes are more flexible and can better apply situation specific, timely solutions to a crisis and changes in the environment (McKinsey & Company, 2023; Janssen and van der Voort, 2020). Magistretti and Trabucchi (2025) showed a dual perspective on agile: as a useful tool in contingency management for adapting to challenges and as an organizational culture that impacts both management and employees.

Resilience can be defined as the ability of an organization to effectively manage the negative effects (Jin et al., 2024) and recover, adapt, and even thrive from challenges (Mizrak, 2024). Business resilience is characterized by continuous evolution, protection from disruptions, development of adaptive capacity, and value creation. Its key aspects include strategic, operational, and functional (Hepfer and Lawrence, 2022), as well as financial resilience (PwC, 2023). Business resilience implies a broader scope than business recovery, including continuous adaptation and growth focus, as well as handling changes. Resilient companies excel in challenging times and have done better than their competitors during the financial crisis of 2007-2008 (McKinsey & Company, 2023). Stakeholder relations and reputation management positively contribute to organizational resilience (Mizrak, 2024), as well as effective organizational learning (Evenseth et al., 2022). Resilience has evolved from a compliance activity to a strategic management activity, enabling competitive advantage. Benefits of properly implementing resilience into an organization include better risk management, reputation protection, and enhanced financial results (PwC, 2023). 57% of respondents from PwC's Global Crisis and Resilience Survey 2023 stated that continuous, up-to-date education of their leaders is essential for maintaining organizational resilience, and around 60% of respondents see technology as necessary for obtaining valuable information and becoming more agile and resilient (PwC, 2023).

3. Methodology

Since crisis management is a fast evolving field, for the secondary data analysis, a structured Narrative Review was applied. It provides exploratory insight into the current state and development trends in organizational crisis preparedness.

To ensure the methodological quality, transparency, and rigor, the Narrative Review assessment was guided by the SANRA (Scale for the Assessment of Narrative Review Articles) instrument (Baethge et al., 2019). The analysis primarily focused on peer-reviewed articles and reputable professional sources published between 2020 and 2025. The stated approach ensured the inclusion of the latest knowledge and trends regarding crisis management technologies used to strengthen organizational crisis preparedness.

Even though peer-reviewed journals were prioritized, this study also assesses contemporary technology use, activities, and crisis management development potential, and therefore reputable gray literature (reports, corporate white papers, preprints, and international documents) was additionally utilized, as these sources provide the latest findings and data that mitigate academic publication lags. This approach incorporates additional business perspectives and practitioners insights that enhance the review's comprehensiveness and validity.

Following SANRA guidelines and its six-item criteria, the primary literature search was conducted in the reputable scientific databases Web of Science (WoS) and Scopus to identify high quality, peer-reviewed studies published between 2020 and 2025. Additionally, Google Scholar was used as a supplementary search engine to identify and obtain relevant gray literature, scholarly papers, and recent developments from the same time period.

Regarding article selection inclusion criteria, peer-reviewed empirical and theoretical papers published in English were prioritized. Furthermore, gray literature sources were subjected to a strict credibility assessment, retaining only sources from recognized organizations (e.g., World Health Organization, EY, Forbes) or verifiable subject matter experts. Exclusion criteria were non-English publications, conference abstracts, and articles published before 2020 with the aim to ensure data quality and to provide the latest knowledge and trends in crisis management.

The search strategy used combinations of keywords related to the core research themes: 'Crisis Management', 'Organizational Crisis Preparedness', and 'Organizational Resilience', combined with 'Artificial Intelligence', 'Development Trends', and 'Modern technologies'.

4. Contemporary and emerging technologies and activities in crisis management

4.1. Contemporary technologies use and activities in crisis management

Technological advancements improve crisis management across all phases. Use of technology contributes to better crisis prevention, identification, response, and recovery, and in natural disasters, includes reduction of damages and saving lives. Accordingly, continuous improvements are needed in the development of crisis preparedness and resilience building. Fast information gathering and real-time monitoring technologies such as the Internet of Things (IoT), smartphones, and social media help in more effective preparedness and timely dissemination of information, serve as an early warning system, and improve decision making in natural disasters (Krichen *et al.*, 2024). Technologies such as Artificial Intelligence (AI), Artificial General Intelligence (AGI), the Internet of Things (IoT), blockchain, and quantum technologies are rapidly evolving and significantly impacting human activities, academic research, and business processes (Yue and Shyu, 2024).

Crisis mapping models enable real-time assessments of a crisis through geographical information systems (GIS) and data analytics and contribute to crisis management strategy development and increasing organizational resilience (Mizrak, 2024). Artificial intelligence (AI) enhances resilience, risk management, and response capabilities, whereas predictive analytics, machine learning (ML), and optimization algorithms improve crisis preparedness, detection, and response potential to supply chain management operative challenges. Moreover, AI enables real-time forecasting, adaptive inventory control, and efficient logistics reconfiguration in times of crisis. Furthermore, in times of crisis, integrated use of AI, along with IoT and blockchain, improves data transparency and decision making (Teixeira *et al.*, 2025).

Blockchain use in natural disaster management (NDM) helps enhance data security, and information sharing and ensure privacy (Krichen *et al.*, 2025). Through the use of industry case studies, Treiblmaier and Rajeb (2023) assessed blockchain use in disaster prevention and relief activities, where its advantages, among several applications, are notable in enhancing information flows, improving collaboration, trust, and security. Benefits of blockchain are also in humanitarian operations management, especially in improving transparency and efficiency of humanitarian responses (Hunt *et al.*, 2021).

In contemporary disaster preparedness, helpful technologies that are in use for preparedness, identification, response, and subsequent learning from crises include (Krichen *et al.*, 2024, p. 100):

- Early warning systems
- Remote sensing and monitoring
- Communication and information sharing
- Geographical information systems (GIS)
- Drone technology
- Predictive analytics and machine learning
- Building and infrastructure resilience
- Early flood detection systems
- Satellite navigation
- Cloud computing.

Artificial intelligence (AI) in disaster management also contributes to response and mitigation, where geospatial technology provides valuable information for decision makers in disasters (Abid *et al.*, 2021). New technologies in natural disaster management enable more effective and faster responses (Krichen *et al.*, 2024).

In times of disasters, social media often serves as a valuable source of information for people (Abid *et al.*, 2021). In aiding disaster recovery efforts, social media contributes to supporting communities real-time communication needs, reconstruction efforts, resilience and social cohesion building, mental health and emotional support, as well as business and economic activities recovery (Ogie *et al.*, 2022). During the COVID-19 pandemic, social media had both positive and negative aspects, from fast communication of experts advice and messages to being used for spreading misinformation and causing public outrage, where experts needed to appropriately address the challenges through a carefully planned and conducted risk communication strategy (Malecki *et al.*, 2021). Furthermore, open-source Large Language

Model (LLM) helps identify emergencies from social media posts and direct emergency messages and generate actionable output. However, there are issues of ethical use and biases present in generative AI applications that should be properly addressed (Otal and Canbaz, 2024).

AI-driven tools provide real-time information about public sentiment through analysis of social media and the online environment and enable detection of challenges and the spread of fake news, while also monitoring and analyzing large datasets, providing detection of trends, and enabling proactive response and adaptive strategies. In crisis communication, public AI-driven tools help in forming real-time responses to crises and reputation protection, where they can lead to organizations communication competitive advantages (Jeong and Park, 2023; Rainer et al., 2024). Employees outside management functions are often more knowledgeable of specific operational risks, and their proactive approach and preventive activities can contribute to the safety and resilience of the organization. Their input can help detect risks, as well as identify and suggest courses of action to innovate and mitigate problems and overall increase organizational crisis readiness (Zeng et al., 2024).

AI is more frequently used for real-time tracking of crises and responses. It is used in strategic communication when drafting messages, as chatbots (Stieglitz et al., 2022). It enables fast, time saving, and efficient communication response (Ray et al., 2024). Chatbots as tools in crisis and disaster management can have several roles: serve as an early warning system through monitoring of communication, chats, and comments online, as well as provide fast, convenient, clear, and efficient communication responses through social media and websites to frequently asked questions; serve as an additional communication channel; obtain feedback; and provide support to crisis professionals (Labaš et al., 2023). In disaster management, conversational user interface (UI) chatbots, such as ERMES, can improve communication and foster collaboration and sharing of information with stakeholders and citizens (Urbanelli et al., 2024). As conducted experiments on crisis communication using generative AI-powered chatbots have shown, chatbots are useful in crisis communication and are perceived by stakeholders to be competent in conveyed messages. However, depending on the type and depth of crisis, automated crisis communication might need human intervention (Xiao and Yu, 2025). Automated decision making systems and virtual assistants can prepare response strategies and propose resource allocation during crises, reducing response time and helping mitigate human errors. Systems effectiveness relies on predefined criteria such as aim and goal. They can serve as auxiliary crisis management tools that require human supervision to avoid potential mistakes (Labaš et al., 2023).

Advantages of technologies such as social media, smartphones, and the Internet of Things (IoT) enable fast, more precise gathering and efficient dissemination of crisis information, along with alerting capabilities (Krichen et al., 2024). AI and machine learning (ML) allow analysis and extraction of large amounts of information and data from social media that are used as meaningful, applicable findings (Abid et al., 2021). Challenges in AI strategic external communication include possible mistakes in content, ethical use, absence of transparency and disclosure, and implications on the perception of stakeholders that the content was AI generated (Ray et al., 2024).

4.2. Crisis management development perspective and potential

Artificial General Intelligence (AGI), through the use of big data and algorithmic models, simulates and forecasts social behaviors, enabling deep learning and predictive analytics by using self-learning capabilities and actively adapting to changes, modifying organizational structures, and enhancing decision making capabilities, whereas AGI capacities are expected to further develop for managerial research (Yue and Shyu, 2024). In order for crisis innovations and digital transformation to be effective and sustainable, they should be supported by flexible internal structures that follow the accompanying change of digital transformation (Reuschl *et al.*, 2022). As more advanced and developing crisis management technology, especially in forming preemptive management strategies, AGI-driven Intelligence Fusion Networks (IFNs), stemming from the military and public security governance domain, combine big data, AI, and blockchain technologies for managing crises and gaining strategic advantages. Limitations of AGI-driven Intelligence Fusion Networks (IFNs) include inadequate intelligence gathering and departmental information sharing (Yue and Shyu, 2024). On a governmental level, AI-based IFN provides real-time information use and merging, intelligence, enhanced early warning systems (better accuracy and situational awareness, along with risk management) capabilities, data integrity and security by use of blockchain technology, data storage and sharing, and predictive analytical and coordination capabilities, leading to simplification of complexity in crisis management. The stated can have significant implications for crisis management within the organizations (Yue and Shyu, 2024).

Generative AI enables scenario creation beyond traditional, scripted role-play scenarios for crisis simulations. It allows the creation of dynamic scenarios that evolve in real time with each decision made during the crisis management training. Such an advanced generative AI approach to crisis simulations makes decision making look ahead several steps, where various decision options can be considered. It can change certain parameters of crisis simulation and introduce several types of crises at once for decision making complexity, depending on the previous knowledge and level of seniority of the decision maker. Generative AI-driven simulations can provide assessment and final feedback on decisions made, along with potential consequences of decisions and suggestions for improvement and enhancing resilience (Vargas and Melo, 2023). According to practitioners views, AI-powered role-play simulations and immersive training foster teamwork and employee confidence. The role of AI in crisis management is also in more precise early warning systems, especially in natural disaster management. AI-powered tools enable the creation of evacuation plans and the appropriate allocation of resources, ensuring responders a higher level of safety through AI drone or robot use and operational efficiency (Segal, 2025).

Joint crisis management and response exercises can be formed among organizations with the aim of better collective crisis response, assessment of crisis response abilities, as well as development of crisis training and preparedness goals (Johansson and Eriksson, 2024). Guo *et al.* (2025) focused on public sector emergency management using the Cross Organizational Emergency Intelligence System (COEIS) framework. Essential concepts of COEIS framework are also appropriate for use in private sector companies: improving organizational resilience, enabling swift crisis communication and cooperation among the organizations. At the emergency preparedness country level, partnerships among the public sector, private sector, and community organizations improve crisis response to various emergencies, such as health crises, and strengthen resilience (World Health Organization, 2017). Furthermore, alliance

building, accompanied by digital transformation capabilities, develops agile and adaptable supply chains in times of crisis (Dubey, 2024). Crises such as COVID-19 created innovation potential and developments in crisis management in the public sector (Venemyr, 2024). Technological, organizational, and societal innovations during the COVID-19 pandemic contributed to improved resilience and flexibility in businesses and governments (Sharma *et al.*, 2022).

5. Challenges of technology and activities implementation in crisis management

Technology and AI use significantly contributes to the crisis management field, however, certain concerns and challenges should be noted.

While AI use is beneficial in crisis and disaster prediction and response, issues are often present regarding data quality, ethics, privacy and security, bias and fairness, integration with existing systems, responsibility, transparency, and technical knowledge. Investments in research and development and collaboration among stakeholders are needed to ensure more ethical and efficient use of AI in disaster management (Velev and Zlateva, 2023).

Practitioners view algorithmic bias as a significant challenge in AI development, especially its responsible setup and use. Building an appropriate organizational structure and culture, ensuring support of leaders and cooperation are significant in responsible AI development (Rakova *et al.*, 2021). Intelligent Fusion Networks (IFN) and AI limitations of use in crisis management include: AI bias, authenticity of information, deepfake identification challenges, ethical use of AI tools, and over-reliance on AI-based conclusions without critical evaluation (Yue and Shyu, 2024). Crisis management AI algorithms might have biases that reflect specific societal inequalities. Furthermore, challenges in the use of AI tools are with respect to reliability, data quality, transparency, and scalability, as they impact the quality and rationale of AI tools for decision making in crisis management. Another set of challenges is of an environmental nature, where AI in its life cycle, to train learning models, causes high energy consumption and produces carbon emissions, raising sustainability questions. Regulatory frameworks, ethical challenges, and cultural values of AI use in crisis management exist as well, especially concerning privacy, liability, and data protection issues (Rainer *et al.*, 2024). In disaster management field, effective governance, technologies used, such as AI, must respect privacy laws, security, transparency, and data governance in order to earn the public trust (Krichen *et al.*, 2024).

Ethical and effective crisis leadership is essential (Zeng *et al.*, 2024). The cost of implementation and specialized knowledge and skills are notable challenges that need to be addressed when considering the use of technology in crisis management (Krichen *et al.*, 2024). Human supervision is needed to detect potential discrepancies in AI use, and employee AI training is beneficial for the identification of potential risks that the use of AI technology involves (Vanvaria and Kapoor, 2024).

Challenges in AI strategic external communication include possible mistakes in content, ethical use, absence of transparency and disclosure, and implications on the perception of stakeholders that the content was AI-generated (Ray *et al.*, 2024). In a crisis, AI systems that are able to collect and analyze large amounts of data should contribute to better decision

making. However, in crisis situations, more information does not necessarily lead to better decisions, as information overload can lead to missing relevant details. Accordingly, focus should be on preparedness, ensuring data is reliable, relevant, and applicable (Lee et al., 2022). Besides many AI advantages, human professional supervision is still necessary. Even though AI tools contribute to better decision making, they should not replace the human decision maker's judgment, as AI can make mistakes that might be, if unsupervised, very costly, particularly in emergency management (Segal, 2025).

The development of crisis management technologies and AI presents a new risk by itself and potential weaknesses of the crisis management system (Rainer et al., 2024). From the risk management perspective, AI use, besides benefits, brings certain challenges and risks. Accordingly, management strategies for the enterprises exist to mitigate the negative aspects of the use of AI, and those, among others, include (Caballar, 2024):

- Biases- address with human ethics oversight, representative training data sets, fairness and metrics for assessment, and implementation of bias mitigation processes during the AI lifecycle.
- Environmental harms- AI use and training of algorithms consume large amounts of energy and water for cooling of servers in data centers, as well as cause carbon emissions. Accordingly, enterprises can consider the use of renewable energy powered data centers or train on less data, as well as choose energy efficient AI models.
- Absence of accountability- who is responsible if an AI-powered tool does harm and makes costly mistakes? Therefore, audit trails and logs should be kept available for revision of AI's behavior and decisions, as well as all records of human decisions made during implementation and AI use.
- AI misinformation and disinformation- limit AI hallucinations with human oversight of AI outputs, assessment of sources, and training of users and employees can be helpful and reduce the potential risks. Testing of AI models, assessment, and adjustments contribute to less misinformation and disinformation.

Biased AI systems, deepfakes, and AI hallucinations (false information presented) can damage an organization. Mitigation starts with an ethical AI framework and governance, where standards and guidelines such as the NIST AI Risk Management Framework can be helpful (Caballar, 2024).

Responsible AI use in crisis management challenges and suggestions includes (Lee et al., 2022):

1. Equity and fairness- focus should be on marginalized and vulnerable groups, where defined equity and fairness criteria for AI should ensure better outcomes.
2. Biases in data- proposed activities and design should reduce biases and potentially false information for decision makers.
3. Explainability and transparency- systems used should be understandable to users and stakeholders to enable better knowledge sharing among organizations and increase user trust.
4. Accountability and credibility- determine responsibility in the organization for AI results, and work on the organization's reputation for reliability in the eyes of stakeholders through focusing on the education of developers, decision makers, and stakeholders about the properties of AI models.

5. Inter-organizational coordination and public involvement- especially for large scale crises, AI should foster collaboration, transparency, and involvement of a variety of stakeholders.
6. Information privacy and security- ethics framework should be implemented, where the privacy of personal data should be ensured even in disasters.

6. Results and applicability

Based on the findings and analysis presented in the paper, propositions have been developed and systematized by collecting, studying, comparing, and connecting current theoretical and practical knowledge from various recent sources of literature.

Table 1. Benefits, limitations and challenges, and propositions of contemporary tool use and activities for effective crisis management

BENEFITS OF CONTEMPORARY TOOL USE AND ACTIVITIES IN CRISIS MANAGEMENT
<ul style="list-style-type: none"> • Technology use enables fast information gathering, advanced real-time monitoring and analytics, and better crisis management in all of its phases (Mizrak, 2024; Krichen <i>et al.</i>, 2024; Ray <i>et al.</i>, 2024). • Technologies provide more effective preparedness and timely dissemination of information through social media, early warning systems, crisis detection, and help in response and decision making, especially in the management of natural disasters (Krichen <i>et al.</i>, 2024; Abid <i>et al.</i>, 2021). • AI-driven tools provide organizations with real-time monitoring, forecasting, and analysis of large sources of data; detection of trends and public sentiment analysis of social media and the online environment; and enable proactive response and adaptive strategies (Yue and Shyu, 2024; Jeong and Park, 2023; Teixeira <i>et al.</i>, 2025; Rainer <i>et al.</i>, 2024). • Social media assists disaster recovery by supporting communities real-time communication needs, fostering resilience and social cohesion building, and supporting mental health, as well as business and economic recovery (Ogie <i>et al.</i>, 2022). • The generative AI approach to crisis simulations enables dynamic forward looking decision making, where various decision options can be considered (Vargas and Melo, 2023). • Partnerships among the public sector, private sector, and community organizations improve crisis response to various emergencies, such as health crises, and strengthen resilience (World Health Organization, 2017). • AI-driven chatbot enables fast, time saving, and efficient crisis detection and automated communication response (Ray <i>et al.</i>, 2024; Urbanelli <i>et al.</i>, 2024; Labaš <i>et al.</i>, 2023). • The use and benefits of blockchain in disaster management and humanitarian operations management are especially in improving transparency, data sharing and security, collaboration, and efficiency of responses (Hunt <i>et al.</i>, 2021; Krichen <i>et al.</i>, 2024; Treiblmaier and Rajeb, 2023).
LIMITATIONS AND CHALLENGES OF CONTEMPORARY TOOL USE AND ACTIVITIES IN CRISIS MANAGEMENT
<ul style="list-style-type: none"> • Respect for privacy laws, security, ethics, responsibility, transparency, and data governance are relevant in order to earn the public trust (Velev and Zlateva, 2023; Otal and Canbaz, 2024). • AI limitations in crisis management include authenticity of information, deepfake identification challenges, AI hallucinations, ethical use of AI tools, AI bias, and overreliance on AI-based conclusions without critical assessment, which can cause reputation damage to an organization (Yue and Shyu, 2024; Caballar, 2024).

- Challenges in the use of AI tools concern reliability, data quality, accountability, transparency, and scalability as they impact the quality and rationale of AI tools for decision making in crisis management. Another set of challenges is of an environmental nature, where AI training causes high energy consumption and produces carbon emissions, raising sustainability issues. The development of AI for crisis management presents new risks and potential system vulnerabilities (Rainer *et al.*, 2024; Caballar, 2024).
- AI strategic external communication challenges can include mistakes in content, ethical use, inadequate transparency and disclosure (Ray *et al.*, 2024).
- AI can make mistakes that might be critical if undetected particularly in emergency management (Segal, 2025).
- Responsible use of AI in crisis management can raise issues. Accordingly, equity and fairness, algorithmic biases in data, explainability and transparency, accountability and credibility, inter-organizational coordination and public involvement, and information privacy and security should be addressed (Lee *et al.*, 2022; Rakova *et al.*, 2021).
- Implementation costs and specialized knowledge and skills are notable challenges of technology use in crisis management (Krichen *et al.*, 2024).

PROPOSITIONS

- Forming preemptive crisis management strategies that combine the use of big data, AI, IoT and blockchain technologies for managing crises, improving data transparency, decision-making and gaining strategic advantages (Yue and Shyu, 2024).
- Foster open two-way communication that contributes to employees greater contribution to the higher safety, resilience, and readiness of the organization through risk detection, innovation, and mitigation of problems (Zeng *et al.*, 2024).
- Crisis professionals should carefully plan and conduct a social media communication strategy and be aware of associated risks (Malecki *et al.*, 2021).
- Chatbots and virtual assistants can improve communication, serve as an early warning system, and foster collaboration and sharing of information with stakeholders (Urbanelli *et al.*, 2024; Labaš *et al.*, 2023). Chatbots are perceived by stakeholders as useful in strategic crisis communication, particularly in drafting and conveying messages (Xiao and Yu, 2025; Stieglitz *et al.*, 2022).
- AI tools contribute to better decision making, but should not replace the human decision making and supervision of AI use (Segal, 2025; Vanvaria and Kapoor, 2024).
- Investments in research and development and joint stakeholder efforts are needed to more ethically and efficiently use AI in disaster management (Velev and Zlateva, 2023).
- Setting an ethical AI framework and governance within the organization, along with informing employees and effective leadership, is an adequate way to start mitigating AI challenges (Caballar, 2024; Zeng *et al.*, 2024).
- Sustainable crisis innovations and digital transformation should be supported by flexible internal structures that enable digital transformation (Reuschl *et al.*, 2022).
- Technological, societal, and organizational innovations contribute to improved crisis management strategies, resilience, and flexibility in businesses and governments (Sharma *et al.*, 2022; Mizrak 2024).
- Alliance building, accompanied by digital transformation capabilities, develops agile and adaptable supply chains in times of crisis (Dubey, 2024).
- Inter-organizational crisis exercises improve joint response, assess capacities, and develop crisis training and preparedness goals (Johansson and Eriksson, 2024).

Source: Author.

7. Conclusion

With increasingly more complex and globally interconnected risks and crises, organizational crisis preparedness requires new approaches and adequate technological support. Accordingly, this paper provided a literature overview of contemporary crisis management tools and activities, along with their development trends and perspectives. Latest findings and trends in crisis management were analyzed, providing answers to research questions: 1) presented main contemporary activities, technologies, and AI applications used in crisis management, and 2) presented main emerging crisis management technologies and activity trends. The contribution of the paper is in synthesized contemporary crisis management technologies use and activities, benefits, limitations, and challenges, and propositions for effective crisis management. As the literature review in this paper presented, contemporary activities and technological advancements such as AI-driven tools, chatbots, machine learning (ML), the Internet of Things (IoT), big data, and blockchain are useful for effective crisis preparedness and resilience building, especially for improved proactive communication, transparency, real-time monitoring and analysis, early warning capabilities, and help in better decision making, as well as collaboration, fostering innovation, and digital transformation. Existing limitations and challenges of contemporary tool use and activities in crisis management are in AI use limitations (AI biases, authenticity of information, transparency, and data quality), the need for leaders continuous education and development training about technologies in crisis management, communication, data preparation and decision making challenges, and responsible AI use in crisis management. The research insights highlight that the crisis management development perspective and potential are in communication and collaboration, further development and use of generative AI, such as in dynamic scenario creation decision making simulations, innovations, and digital transformation. From the analysis, the propositions are that organizations should focus on AI and technology integration in crisis management; effective use of ethics, governance, and risk mitigation; communication and collaboration; capacity building and training; and organizational agility and alliance building. The paper provided an overview of the contemporary crisis management literature, considering technologies and activities used for improving crisis preparedness and organizational resilience. As presented in the conducted analysis, there exists a continuous need for improvement in the development of crisis preparedness and resilience building, where technology and its rapid evolution have significant potential. A number of technologies and AI applications are already in use in disaster management that can also be used and beneficial for business organizations. This research results and findings provide insights towards a more comprehensive understanding of contemporary crisis prevention and preparedness and crisis management literature, as well as provide benefits to organizations and their decision makers by highlighting key crisis management development trends and response and resilience strengthening approaches. Stated findings and insights can serve as crisis preventive propositions and activities that can help managers in improving organizational crisis preparedness, agility, and readiness. The research limitations include the reliance on secondary data and the limited volume of relevant literature analyzed. A language bias is also present, since the included sources were only in English; certain relevant, regional insights may have been excluded. Additionally, since a narrative review methodology was used, there is an inherent potential selection bias in literature source selection, as the process was purposive rather than exhaustive, and not all relevant studies may have been included. Furthermore, there is a potential risk of overgeneralization of findings based on the limited amount of analyzed literature. Additionally, this study identifies directions for future research in this significant field of crisis management: i) analysis of crisis management tool use and

activities in specific industries such as energy and utilities, transportation and logistics, and critical infrastructure; ii) use of AI and other emerging technologies in crisis communication strategies, contribution to collaboration and coordination, blockchain applications, and quantum computing perspective; iii) focus on disaster management and building resilient communities considering sustainable and climate-conscious use of technology; iv) crisis professionals and leaders education and training with respect to new methods, technologies, and AI use in crisis management. AI's potential to transform the crisis management field is significant, and further technological developments and substantial benefits are expected.

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