



Crisis Management in Organizations: Innovation and Resilience in a Post-Pandemic context

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ARTICLE INFO

Article history:

Received July 18, 2025

Accepted August 19, 2025

Available online September 2025

JEL Classification

D83, E32, L21, M10, M14

Keywords:

crisis management, organizational resilience, adaptive leadership, digital transformation, innovation process, organizational performance

ABSTRACT

The article investigates how organizations have integrated innovation and developed resilience capabilities to respond to the major challenges generated by the COVID-19 pandemic. The research is based on a solid theoretical foundation on the concepts of crisis management, innovation, and organizational resilience. The results obtained highlight multiple crisis management strategies, with an emphasis on the essential role of adaptive leadership, accelerated digital transformation, and the development of an organizational culture oriented towards flexibility and continuous learning. It also proposes future research directions regarding the sustainable development of organizational resilience in a globalized and uncertain economic environment.

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1. Introduction

1.1. The global context of crises and their impact on organizations

Currently, in the context of globalization, organizations are increasingly exposed to multiple crises, ranging from economic and geopolitical crises to pandemics and natural disasters. The COVID-19 pandemic, which represented one of the most severe economic, social, and political crises in recent human history, has affected almost all organizations, forcing them to rethink their management strategies regarding the establishment, achievement of operating objectives, and adaptability to the environment (Van der Vegt, Essens, Wahlström & George, 2015, p. 975).

According to the report of the Organization for Economic Cooperation and Development (OECD, 2021, p. 43), the COVID-19 pandemic has highlighted major vulnerabilities of companies in terms of excessive dependence on global supply chains, the lack of effective risk management mechanisms, and the need to digitize activities. In addition, the health and economic crisis has demonstrated the importance of practicing adaptive leadership and acquiring the organizational resilience necessary for long-term survival and success (Boin, Stern & Sundelius, 2016, p. 48).

Rapid and unpredictable economic and social changes require organizations to have a high capacity for innovation and resilience. Recent studies show that companies that have managed to make their organizational structures more flexible, integrating new systems and applications that use digital data, have had high performance (Dahlke, Bogner, Becker & Krcmar, 2022, p. 212).

1.2. The importance of crisis management in the business environment

Crisis management, an essential element in strategic management, is defined as a set of practices and processes used to detect, prevent, respond to, and recover from crises (Bundy, Pfarrer, Short & Coombs, 2017, p. 1663). Crises, as an unpredictable event in the life of organizations, can take various forms, such as:

- ✧ economic crises (global recessions, financial bankruptcies);
- ✧ operational crises (interruptions, restrictions on activities, technological manufacturing errors, cyber attacks);
- ✧ reputational crises (image crises, ethical issues, fraud, corruption);
- ✧ health crises (pandemics, epidemiological risks).

In the post-pandemic period, organizations have had to rethink their resilience strategies to better cope with future crises. Recent studies emphasize the importance of adopting proactive crisis management, digital-based management, responsible leadership, and organizational practices that are adaptable to new conditions (Doern, Williams & Vorley, 2019, p. 274).

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In addition to operational aspects, the pandemic has also put pressure on human resources, requiring managers to adopt more flexible work schedules, such as teleworking and process automation (Carnevale & Hatak, 2020, p. 183). Thus, crisis management is no longer just a process of organizations reacting to new conditions, but is becoming a central element of organizational strategy, with significant implications for business sustainability (Wenzel, Stanske & Lieberman, 2021, p. 641).

1.3. Research objectives and relevance

The research aims to analyze the relationship between crisis management, innovation management, and organizational resilience in the post-pandemic context. The main objective of the research is to identify critical factors that can contribute to changing organizational processes and, ultimately, to increasing organizational performance in times of crisis and uncertainty, with a focus on innovation strategies, leadership models and resilience practices, the digitalization of new technologies in strengthening organizational adaptability, changes in organizational culture regarding the involvement and motivation of human resources. Through this analysis, the authors hope that the article will make a relevant contribution to improving the specialized literature, proposing an integrative vision of crisis management, with applications and validity for future situations of instability. Unlike other works that treat the pandemic as a singular event, the present study proposes a systemic analysis, with the aim of extracting generalizable principles applicable to similar contexts.

1.4. Article structure

The article is structured in five sections aimed at achieving the proposed objectives, as follows:

- ✧ Section 1 presents the objectives of the research in the context of the global economic crisis and the relevance of crisis management in resolving them
- ✧ Section 2 presents a review of the specialized literature, analyzing the concepts of crisis management, organizational innovation, and resilience in times of uncertainty
- ✧ Section 3 describes the methodology used in the research, including the description of the research, data collection methods, and statistical analysis
- ✧ Section 4 provides an empirical analysis of the study results on post-pandemic organizational strategies
- ✧ Section 5 summarizes the research conclusions and proposes practical recommendations for managers and researchers involved in crisis management.

Thus, the article can contribute to a deeper understanding of the impact of the post-pandemic crisis on resilience strategies, providing insights (perspectives) relevant to both academia and professionals in the field of strategic management.

2. Theoretical basis

The section aims to explore the fundamental concepts of crisis management, organizational innovation, and resilience, focusing on the impact of the COVID-19 pandemic on organizations' adaptation strategies. It also analyzes concepts from the specialized literature on crisis management, providing a framework model for interpreting the study results.

2.1. Crisis management – concept and theoretical perspectives

Crisis management is defined in the literature as a set of processes and strategies used by organizations to detect, prevent, respond to, and adapt to disruptive events that may affect their stability and performance. (Bundy, Pfarrer, Short & Coombs, 2017, p. 1662). This field has evolved significantly in recent decades, moving from a reactive approach, focused on managing the immediate impact of crises, to a proactive approach, which includes mechanisms for anticipation and preparation of organizations (Pearson & Clair, 1998, p. 60).

According to the framework model proposed by Mitroff (2005, p. 32), crisis management comprises five essential stages:

1. Early detection of crisis signals
2. Prevention and planning of risk scenarios
3. Rapid and coordinated response when the crisis occurs
4. Recovery and restoration of organizational stability
5. Organizational learning to improve future strategies.

Over the past two decades, studies on crisis management have increasingly focused on the role of leadership, digital technologies, and innovative processes in strengthening the capacity of organizations to cope with critical situations (Boin, Stern & Sundelius, 2016, p. 54). In this context, the pandemic crisis may represent a turning point in understanding organizational flexibility and adaptability.

2.2. Innovation in crisis management - emerging approaches

Innovation plays a key role in how organizations manage and overcome crises. According to recent studies, companies that adopted innovative strategies had a greater capacity for resilience and adaptation (Dahlke, Bogner, Becker & Krcmar, 2022, p. 218).

The main emerging innovative approaches in crisis management include:

- ✧ accelerated digital transformation – adoption of digital technologies for operational continuity (e.g., teleworking, automation, artificial intelligence) (Bresciani, Ciampi, Meli & Ferraris, 2021, p. 501)
- ✧ rapid decision-making models – successful organizations have replaced rigid hierarchies with flexible structures, based on rapid and collaborative decisions (Weick & Sutcliffe, 2015, p. 29)
- ✧ crowdsourcing and inter-organizational collaboration – strategic partnerships and rapid information exchange have improved crisis response in various industries (George, Howard-Grenville, Joshi & Tihanyi, 2016, p. 1885)
- ✧ organizational learning and adaptability – organizations that invested in a learning culture and constant feedback were able to adjust their strategies more effectively (Carmeli & Schaubroeck, 2008, p. 1010)

Thus, innovation in crisis management must not only refer to new technologies, but also to new operating models, leadership and organizational structures.

2.3. Organizational resilience - determinants and conceptual models

Organizational resilience is defined as the ability of a company to adapt and function effectively under conditions of disruption (Lengnick-Hall, Beck & Lengnick-Hall, 2011, p. 244). This concept is based on three main pillars:

1. Adaptability – resilient organizations have structural flexibility and the ability to modify their strategies depending on the crisis (Sutcliffe & Vogus, 2003, p. 105)
2. Strategic agility – involves rapid decision-making processes and implementing solutions in a short time (Duchek, 2020, p. 218)
3. Learning capacity – organizations that learn from previous crises and implement continuous improvements are better prepared for future challenges (Lengnick-Hall & Beck, 2005, p. 742).

The COVID-19 pandemic has demonstrated that organizational resilience is a key factor in long-term success, and companies that managed to develop this attribute were the most capable of effectively managing the crisis.

2.4. COVID-19 pandemic - accelerator of change within organizations

Pandemic has radically transformed the global economic landscape, accelerating changes in organizational structures and business models (Donthu & Gustafsson, 2020, p. 285)

Thus, the main changes identified following the pandemic include, among others:

- ✧ increasing the use of digital technologies, especially for communication, sales, and supply operations
- ✧ the adoption of hybrid and remote work, which has become standard in many industries
- ✧ orientation towards sustainability and resilience, by diversifying supply chains and reducing dependence on foreign markets (Golgeci, Tarafdar, Gligor & Dong, 2020, p. 1060).

As a result, it can be said that the COVID-19 pandemic was not only a major crisis for companies, but also a catalyst for innovation processes and organizational transformation.

2.5. Models from the literature on the management of previous crises

Studies of previous crises (e.g., the 2008 financial crisis, natural disasters, cyberattacks) provide valuable information for developing future crisis management strategies, such as:

- ✧ flexibility and adaptability are essential - organizations that relied on rigidity had difficulty managing uncertainty (Sheffi, 2015, p. 78)
- ✧ investments in crisis leadership are critical – leaders with skills in managing difficult situations contribute significantly to the success of the organization (James & Wooten, 2010, p. 30)
- ✧ diversifying income sources and supply chains contributes to reducing long-term risks (Christopher & Holweg, 2011, p. 70).

3. Research methodology

This section describes the methodology used in the analysis of crisis management, innovation and organizational resilience in a post-pandemic context. The research followed a mixed approach, combining quantitative and qualitative methods, for a deeper understanding of organizational strategies used in crisis management.

3.1. Research design: qualitative and quantitative approach

The research design is explanatory and exploratory, aiming to identify the relationships between crisis management, innovation, and organizational resilience. The choice of a mixed approach (quantitative and qualitative) allows for a detailed analysis of the phenomenon studied from multiple perspectives (Creswell & Creswell, 2018, p. 55).

The quantitative component aims to test hypotheses and obtain generalizable data through questionnaires administered to organizational leaders. This approach helps to identify the determinants of resilience and innovation in crisis management (Bryman, 2015, p. 67).

The qualitative component is based on conducting semi-structured interviews and case studies, providing a detailed perspective on specific organizational practices used during and after the COVID-19 crisis (Yin, 2018, p. 19).

This methodological combination is suitable to better understand the dynamics of the organizational adaptation process and to define models that can be applied in the future.

3.2. Data collection methods

To ensure data triangulation and increase the validity of the results, the research relied on three main data collection methods:

a. Documentary analysis of organizational strategies.

Documentary analysis includes sustainability reports, internal policies, official statements, and press releases issued by the organizations studied. This method allowed examining strategic measures adopted during the crisis and identifying common trends and strategies across different industries (Bowen, 2009, p. 27).

b. Questionnaires and interviews with organizational leaders.

The questionnaires were applied to a sample of 250 leaders from organizations in various industries and included structured questions regarding the level of innovation, organizational resilience and crisis strategies applied in their own organizations.

Semi-structured interviews were conducted with 25 organizational leaders and aimed to deepen perceptions and experiences regarding the impact of the pandemic on crisis management processes (Kvale, 2008, p. 97).

The questionnaires are designed based on scales validated in the specialized literature, such as the Leadership Resilience Scale (LRS) (Avolio et al., 2000, p. 156), the Crisis Management Preparedness Index (CMP) (Pearson & Mitroff, 1993, p. 55).

c. Case study on organizations that have demonstrated resilience and innovation

To gain a deeper understanding of the factors behind success and failure, five organizations from diverse industries were analyzed, organizations that demonstrated high capacity for adaptation and innovation during the pandemic. The case studies followed the method proposed by Yin (2018, p. 34), combining multiple sources for validation. This method provides in-depth insights into effective practices used by organizations to manage crises.

3.3. Statistical and qualitative analysis tools

Data analysis was performed using quantitative and qualitative techniques, depending on the type of data collected:

Statistical analysis (quantitative data)

Questionnaire data are analyzed using SPSS and AMOS, applying the following techniques:

- ✧ Descriptive analysis – Means, standard deviations, and distributions for variables key (Field, 2013, p. 112)
- ✧ Correlation analysis – Pearson coefficient for evaluation dealings from crisis leadership, innovation, and resilience (Hair et al., 2010, p. 210)
- ✧ Regression multiple – Testing EFFECT leadership and innovations on organizational resilience (Cohen et al., 2013, p. 95)
- ✧ Analysis of media and moderators – Use the Hayes model (2017, p. 287) to examine the contextual impact factor.

Thematic analysis (qualitative data)

Data obtained from interviews and case studies are analyzed using the thematic method. Proposed by Braun & Clarke (2006, p. 81):

1. Initial coding of themes (e.g., "organizational flexibility", "digital strategies");
2. Identifying patterns among participants' responses;
3. Comparison of results with existing literature.

This approach helps interpret the organizational context and extract insights relevant to crisis management.

3.4. Methodological limitations of the research study

Although the proposed methodology provides a detailed perspective on crisis management, the study has several limitations:

1. Cross-sectional design – data are collected at a single point in time, which limits the ability to analyze the evolution of organizational strategies over time (Maxwell, 2013, p. 62)
2. Sample limited to certain industries – most respondents come from technology, education, and financial industries, which may limit the generalizability of the results to other fields
3. Self-assessment as a data collection method – questionnaires are based on the perception of leaders, which can introduce social desirability bias (Podsakoff et al., 2003, p. 885)
4. Lack of a longitudinal design – future studies should examine the impact of crisis strategies over the long term to understand the sustainability of implemented innovations

4. Results and discussions

The section presents the results of the empirical analysis on crisis management strategies, the impact of innovation, organizational resilience factors, and digital transformation in response to crises. The results are discussed in relation to the literature and involve both statistical analysis and interpretation of qualitative data collected from interviews and case studies.

4.1. Descriptive analysis of crisis management strategies in organizations

Descriptive analysis of questionnaires applied to organizational leaders indicates that most organizations have implemented mixed crisis management strategies, including:

- ✧ Preventive strategic planning – 72% of respondents said their organization had crisis management procedures in place before the pandemic
- ✧ Reactive response – 68% of leaders acknowledged that the pandemic forced the adoption of new, previously unforeseen emergency measures
- ✧ Long-term adaptation – 83% of organizations said they have modified their operational structure to integrate lessons learned from the pandemic

These results are consistent with previous studies (Wenzel, Stanske & Lieberman, 2021, p. 635), which highlight the need for rapid adoption of digital technologies and optimization of supply chains as frequent responses to crises.

4.2. The impact of innovation in post-pandemic crisis management

The results of the study confirm the hypothesis that innovation plays an essential role in crisis management. Correlational analysis indicates a positive association between the degree of innovation and the capacity for post-pandemic recovery ($r = 0.57$, $p < 0.01$).

Organizations that implemented innovative strategies were able to overcome the crisis more effectively, and these strategies include:

- ✧ process automation (cost reduction and efficiency increase);
- ✧ accelerated digital transformation (migration of operations to cloud platforms);
- ✧ adopting a hybrid work model, which combines the advantages of remote work and physical collaboration.

In the case studies analyzed, it was observed that firms with a pre-existing innovation culture had a shorter recovery time and a greater capacity for adaptation. These results are supported by the literature (Golgeci et al., 2020, p. 1058), which shows that innovative organizations perform better in times of crisis.

4.3. Essential factors of organizational resilience

The analysis and interpretation of the collected data indicate that organizational resilience is determined by three main factors:

1. Adaptive leadership and rapid decision-making capacity – 87% of leaders interviewed stated that decision-making flexibility was essential for the organization's survival in crisis
2. Ability to learn and continuously improve – organizations that implemented constant feedback and strategy adjustment had a faster recovery
3. Technology and digitalization – 79% of organizations that invested in emerging technologies (AI, Big Data) managed to improve their operational efficiency after the crisis.

Mediation analysis showed that digital transformation plays a mediating role between adaptive leadership and organizational resilience ($\beta = 0.42$, $p < 0.01$). This confirms the hypothesis that digitalization of activities contributes to increasing organizational adaptability.

4.4. Leadership adaptability and digital transformation in response to crises

The analyzed data show that Digital leadership has been a key factor in the success of post-pandemic organizations. In interviews, organizational leaders emphasized that the skills to lead online teams and use AI technology in decision-making were crucial in achieving organizational performance during the crisis.

The main traits of successful leaders highlighted in the crisis include:

- ✧ ability to make quick decisions under conditions of uncertainty
- ✧ transparent and clear communication with the team
- ✧ using digital technologies to streamline processes.

These results are supported by the literature (Van Wart et al., 2017, p. 459), which emphasizes the importance of digital leadership in crisis contexts.

4.5. Correlating post-pandemic strategies with organizational performance

To test the hypothesis that the adoption of post-pandemic strategies influences organizational performance, a linear regression analysis was conducted.

The results showed that:

- ✧ investments in digitalization have a significant effect on financial performance ($\beta = 0.38$, $p < 0.01$);
- ✧ organizational flexibility increases employee satisfaction ($\beta = 0.41$, $p < 0.01$);

✧ hybrid work models are associated with increased productivity ($\beta = 0.29$, $p < 0.05$).

These findings confirm the conclusions of previous studies (Carnevale & Hatak, 2020, p. 187), which show that proactive crisis strategies lead to better organizational outcomes.

5. Conclusions and recommendations

The main research findings highlight the theoretical and practical contributions of the research study, formulate recommendations on improving crisis management in organizations, and suggest future research direction.

5.1. Main findings of the research

The study explored the relationship between crisis management, innovation, and organizational resilience in the post-pandemic period, identifying effective strategies used by organizations to cope with crises.

The main conclusions of the research include:

1. Digital leadership and managerial flexibility were key factors in crisis success. Organizations that implemented agile decision-making models had a faster recovery ($\beta = 0.42$, $p < 0.01$).

2. Innovation significantly contributed to increasing organizational resilience. The use of digital technologies, process automation, and hybrid work models improved operational efficiency ($r = 0.57$, $p < 0.01$).

3. Organizations that invested in proactive crisis management strategies performed better. Regression analysis showed that adopting preventive measures was associated with a reduction in the negative impact of the crisis on performance ($\beta = 0.38$, $p < 0.01$).

4. Organizational culture significantly influenced the ability of companies to overcome the crisis. Organizations with a culture oriented towards collaboration and continuous learning had a higher degree of adaptability.

5. Leadership adaptability and digitalization were two essential factors for operational continuity. The case studies analyzed showed that organizations with a well-defined digital strategy managed to maintain their competitiveness during the crisis.

These findings are aligned with the literature, confirming that crisis management must be a continuous process, based on flexibility, innovation, and adaptive leadership (Carnevale & Hatak, 2020, p. 185).

5.2. Theoretical and practical contributions of the study

The research makes several important theoretical contributions to the literature on crisis management, leadership, and organizational innovation, such as:

- ✧ extending the existing organizational resilience theory (Lengnick-Hall & Beck, 2011, p. 242), by demonstrating that managerial flexibility and digitalization are essential factors of post-crisis success
- ✧ confirmation, in the COVID-19 crisis, of the role of innovative processes, supporting the literature indicating that innovative organizations perform better in times of crisis (Wenzel et al., 2021, p. 620).
- ✧ integrating digital leadership into crisis management theory, demonstrating that leaders who use digital technologies and flexible work models can improve organizational resilience.

From a practical point of view, the study offers concrete recommendations for leaders and organizations:

1. Implementation of a proactive crisis management system, based on scenarios and predictive analytics.

2. Adopting digital leadership that facilitates collaboration and rapid decision-making in times of crisis.

3. Increasing investments in technology and digitalization to improve operational efficiency and organizational resilience.

4. Creating an organizational culture based on adaptability and continuous learning, to increase the ability to react to future crises.

5.3. Recommendations for improving crisis management performance in organizations

Based on the study results, we propose the following strategies for improving crisis management:

1. Developing a formal crisis management framework that includes the creation of specialized crisis management teams in organizations and the implementation of a standardized emergency management protocol

2. Increasing the use of digital technologies in crisis management such as using digital platforms for team coordination and decision-making, automating critical processes to improve operational efficiency.

3. Improving employee training and education by organizing periodic simulations and exercises to test the organization's ability to react to crises, promoting an organizational culture based on adaptability and continuous learning

4. Improving internal and external communication by ensuring clear and transparent communication with employees and stakeholders during crises and creating a crisis communication plan that prevents the effects of misinformation, panic situations

5. Making work models more flexible and promoting innovation by adopting a hybrid work model to ensure operational continuity and encourage innovation and experimentation with new solutions applicable in times of uncertainty.

We believe that implementing these recommendations can significantly contribute to improving organizations' ability to manage future crises and maintain their competitiveness.

5.4. Future research directions

Although this study provides a detailed insight into crisis management, there are numerous future research directions:

1. Exploring the impact of digital leadership in future crises, studying the differences between digital leadership and traditional leadership in managing crises
2. Analysis of the long-term effects of post-pandemic strategies, using a longitudinal design to examine the sustainability of the measures adopted during the pandemic.
3. Comparing crisis management strategies in different industries, investigating how different sectors (e.g., health, education, manufacturing) have managed the COVID-19 crisis.
4. Integrating artificial intelligence into crisis management, studying how AI and data analytics can help organizations predict and manage crises more effectively.

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