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INNOVATIVE APPROACHES TO CRISIS MANAGEMENT WITHIN THE CONTEXT OF BALANCED ECONOMIC SECURITY

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Abstract. Crisis management is an integral part of ensuring economic security in volatile market conditions. The growing complexity of economic challenges necessitates the development of innovative approaches that enhance resilience and adaptability. This article examines theoretical and practical aspects of innovative crisis management strategies within the framework of balanced economic security. The study identifies key mechanisms of crisis management, evaluates their impact on financial stability, and explores the role of digitalization and financial innovation in mitigating economic risks. Based on recent research and case studies, this article contributes to the academic discourse on sustainable economic resilience by proposing a structured approach to integrating crisis response strategies into corporate and national economic frameworks. The findings underscore the necessity of financial flexibility, strategic adaptation, and technological integration in contemporary crisis management. Furthermore, the research methodology employed in this study includes a systematic review of recent academic publications, case study analysis of crisis management applications, and a comparative approach to evaluating financial and digital innovation strategies. The scientific novelty of this article lies in the identification of specific technological advancements, such as artificial intelligence (AI) and blockchain, as key components in modern crisis management frameworks. This study not only consolidates existing research but also proposes a forward-looking model that integrates these innovations into corporate and national security policies. The practical significance of this research extends to policymakers, corporate executives, and financial institutions, providing them with actionable insights into implementing resilient economic security strategies.

Keywords: crisis management, economic security, strategic resilience, financial stability, digital transformation, innovation, artificial intelligence, blockchain, risk assessment.

INTRODUCTION. In the modern global economy, characterized by increased turbulence and uncertainty, effective crisis management has become critically important for ensuring balanced economic security. The concept of economic security encompasses the ability of a country, industry, or enterprise to sustainably meet its needs and withstand external and internal shocks [1]. Frequent financial and economic crises, geopolitical conflicts, and global disruptions (such as the COVID-19 pandemic) highlight the need for innovative crisis management approaches that not only minimize damage but also preserve conditions for stable development.

This article analyzes contemporary innovative crisis management strategies in the context of economic security, including successful practices across various industries and at the national level, current trends in digital transformation, financial innovations, and artificial intelligence, as well as recommendations for their implementation. Particular attention is given to the structured and logically coherent presentation of the material, the practical significance of the conclusions, and the assessment of risks associated with the adoption of new technologies.

Problem statement and relevance. The modern economic landscape is characterized by constant uncertainty, frequent financial crises, and unpredictable market fluctuations. Enterprises and national economies face multifaceted threats, including geopolitical instability, technological disruptions, and environmental challenges. Ensuring economic security requires robust crisis management mechanisms that incorporate innovative strategies and adaptive resilience measures. Traditional approaches to crisis management, which predominantly rely on reactive strategies, are

no longer sufficient in the face of complex economic threats. Consequently, there is an urgent need to explore innovative crisis management approaches that can effectively safeguard economic stability while promoting long-term sustainable growth.

Moreover, the rapid advancement of digitalization and financial innovation is reshaping crisis management strategies across industries. Technologies such as artificial intelligence (AI), blockchain, and big data analytics enable real-time risk assessment and predictive crisis modeling, allowing enterprises to anticipate disruptions and respond proactively. Simultaneously, geopolitical instability and environmental factors exert a significant impact on global trade, supply chains, and financial markets, amplifying the vulnerability of businesses.

The entrepreneurial sector, in particular, faces heightened exposure to these evolving risks. Small and medium-sized enterprises (SMEs) often lack the financial buffers and strategic foresight required to withstand systemic shocks, making them more susceptible to market volatility. By integrating technological advancements, financial flexibility, and strategic adaptation into their business models, entrepreneurs can enhance their crisis preparedness and resilience. Effective crisis management within the entrepreneurial sector not only supports individual business sustainability but also contributes to broader economic security by fostering job creation, innovation, and industrial stability.

Thus, this research highlights the necessity of a paradigm shift in crisis management, where proactive, technology-driven strategies replace traditional reactive measures. By examining these aspects, this study aims to establish a comprehensive framework for managing economic crises through innovation-driven approaches, thereby reinforcing balanced economic security at both the corporate and national levels.

Analysis of the latest researches and publications.

Key academic works on crisis management

Crisis management has been extensively explored in the academic domain, with foundational contributions from Igor Ansoff and Peter Drucker, who laid the groundwork for strategic flexibility and crisis response within corporate management. Michael Porter's research on competitive strategies and economic resilience remains influential in understanding how firms adapt to economic distress [2].

In more recent literature, the integration of digital transformation and financial innovation into crisis management has become a central theme. Zainchkovskiy, Shapran, and Kopec (2023) investigate the correlation between crisis phenomena and balanced economic development, emphasizing the necessity of synchronizing economic sustainability and resilience strategies [3]. Their findings align with the broader discourse on adaptive crisis management frameworks that leverage technological advancements.

The European Commission (2022) has contributed to this area by analyzing the role of digital financial tools in economic resilience, specifically focusing on AI-driven risk assessment and blockchain-enabled transparency mechanisms during economic downturns [4]. This aligns with emerging research highlighting the role of predictive analytics, decentralized finance, and digital currencies in mitigating financial shocks.

Further contributions come from Namliiev and Kacicka (2023), who provide a critical assessment of systemic economic crises and their destabilizing effects. Their study highlights the necessity of evolving theoretical frameworks that incorporate globalization risks, technological disruptions, and financial sector vulnerabilities [5]. This analysis reinforces the argument that traditional reactive approaches to crisis management must be replaced by data-driven and preemptive strategies that integrate AI, financial analytics, and regulatory adaptability.

Innovative Approaches to Crisis Management

Recent academic contributions have emphasized technological and interdisciplinary solutions for crisis management. Ali Rashed Aladawi & Ahmad (2023) propose an integrated economic, social, and technological approach, advocating for the use of AI-driven predictive analytics and machine learning algorithms to strengthen financial stability and preempt economic shocks [6].

Loiacono, Mazzullo, & Rulli (2020) examine the role of blockchain in enhancing financial security during crises. Their research demonstrates that decentralized financial structures can mitigate economic volatility, improve fraud prevention, and provide real-time financial risk assessment [7]. This aligns with global trends in regtech (regulatory technology) and suptech (supervisory technology), which have been increasingly adopted by financial institutions and central banks to strengthen regulatory oversight and improve resilience.

Namliiev and Kacicka (2023) extend this discussion by analyzing crisis anticipation mechanisms, financial recoverability, and resilience-building strategies. Their research supports the argument that financial innovations, such as AI-based market simulations and automated liquidity stress testing, are becoming central to long-term economic security [8].

Additionally, Mykhaylova (2021) examines the impact of economic crises on workforce development and education, arguing that modern crisis management must account for reskilling and upskilling to maintain economic stability in periods of uncertainty [9]. This perspective is especially relevant in the context of workforce automation and AI-driven job displacement, reinforcing the need for human capital investment as part of long-term resilience strategies.

Gaps in Existing Research

Despite significant advancements in crisis management research, several critical gaps remain, particularly concerning the real-world application of technological innovations in different economic contexts.

1. SME Adaptation to Digital and Financial Innovations: While much research has focused on large corporations and national economic policies, the impact of AI-driven risk assessment, blockchain, and digital finance on small and medium-sized enterprises (SMEs) remains underexplored. Given that SMEs form the backbone of many economies yet face higher vulnerability to systemic shocks, future studies should investigate scalable and cost-effective digital solutions tailored for resource-constrained enterprises.
2. Crisis Management Strategies Across Different Economic Systems: The literature lacks a comparative analysis of crisis management approaches across diverse regulatory environments. The effectiveness of AI-based financial monitoring, digital resilience frameworks, and state-backed fintech solutions varies significantly between advanced, emerging, and developing economies. A systematic cross-country study could provide valuable insights into regulatory best practices and institutional factors that shape successful crisis mitigation strategies.
3. Bridging Short-Term Crisis Response with Long-Term Economic Stability: While many studies focus on immediate crisis containment measures, fewer address the long-term economic consequences of crisis management interventions. Future research should aim to develop comprehensive models that integrate preemptive economic security mechanisms with post-crisis recovery strategies, ensuring that short-term financial interventions do not undermine long-term resilience.
4. Sustainability and ESG Considerations in Crisis Management: The integration of Environmental, Social, and Governance (ESG) factors into crisis management remains a developing field. Given the rising importance of climate resilience, green finance, and corporate social responsibility, further research is needed to assess how sustainability-focused crisis management strategies can be implemented without compromising economic stability and growth.
5. Risks and Ethical Concerns of AI in Crisis Management: While AI and machine learning present transformational opportunities for crisis detection and response, the literature has not sufficiently addressed the ethical concerns and systemic risks associated with algorithmic decision-making in economic crises. The potential for AI-induced market volatility, data bias in predictive modeling, and over-reliance on automated financial systems warrants further investigation.

This article seeks to address these research gaps by proposing an innovation-driven crisis management framework that integrates financial technology, AI-based risk assessment, blockchain applications, and regulatory best practices. By synthesizing theoretical insights with real-world

case studies, the study provides a structured approach to enhancing economic resilience across corporate, national, and international levels.

The purpose of the article is to develop a comprehensive framework for innovative crisis management strategies within the context of balanced economic security. The study aims to analyze successful practices across industries and national economies, evaluate the role of digital transformation, financial innovations, and artificial intelligence in crisis management, and provide practical recommendations for businesses, governments, and financial institutions. By integrating theoretical insights with real-world case studies, the article seeks to identify key mechanisms for enhancing economic resilience, mitigating systemic risks, and ensuring long-term sustainable growth in the face of global uncertainties.

Research methodology. This study employs a multi-method research design incorporating qualitative and quantitative approaches. A systematic literature review was conducted to identify existing crisis management strategies, followed by a comparative analysis of economic resilience frameworks. Case study analysis was utilized to examine real-world applications of digital innovation in crisis management, focusing on the impact of AI, blockchain, and predictive analytics on economic security. Empirical data were gathered from policy reports, financial databases, and academic publications to support the findings. Limitations of this research include the variability in crisis response effectiveness across different economic sectors and geographic regions. By integrating these methodologies, this study aims to provide a robust, evidence-based model for enhancing crisis resilience through innovation-driven approaches.

PRESENTATION OF THE MAIN RESEARCH MATERIAL.

The concept of crisis management and economic security

Crisis management is traditionally defined as a set of measures aimed at anticipating, preventing, mitigating, and overcoming the negative consequences of crisis situations. Effective crisis management focuses on maintaining the resilience of a system—whether a national economy or an individual company—and ensuring rapid recovery after disruptions. Economic security, in a broad sense, refers to the stability of an economy and the ability of economic actors (governments, enterprises, households) to consistently meet their needs even in times of instability [1].

Balanced economic security implies a harmonious combination of sustainable growth and risk protection, preventing imbalances that could make the economy vulnerable to crises. The interconnection between crisis management and economic security is evident: crises—whether financial, industrial, or social—threaten stability and development, while effective crisis management serves as a tool for maintaining economic security. A balanced approach means that crisis response measures should not undermine long-term sustainability; for example, economic stimulus during a crisis should be combined with risk control, and the introduction of innovations should ensure stability.

Therefore, innovative approaches to crisis management must be examined through the lens of their impact on all aspects of economic security, including financial stability, employment, technological independence, and social resilience.

Successful crisis management practices: industry and national experience

An analysis of real-world case studies demonstrates that timely and unconventional crisis response can significantly reduce damage and accelerate recovery. The following examples illustrate best practices at both industry and national levels:

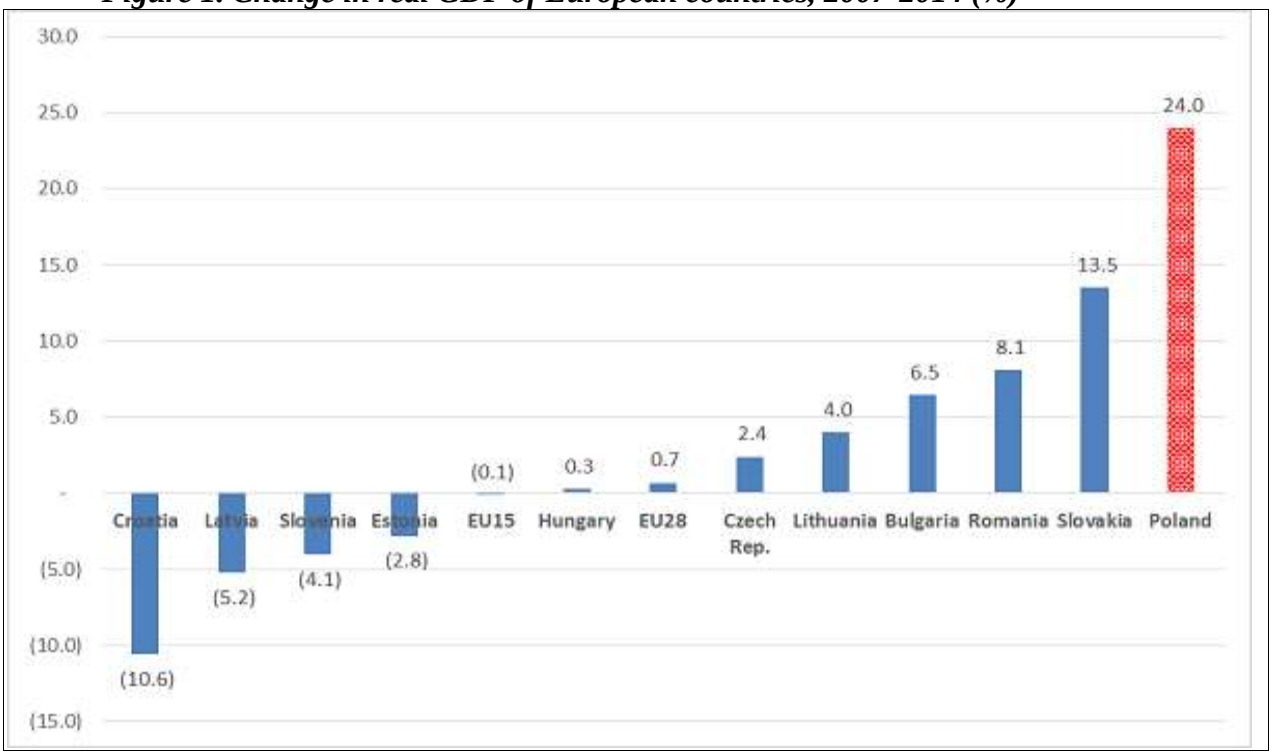
Industry Level. During the COVID-19 pandemic, many companies demonstrated flexibility and innovation, rapidly restructuring their business models to adapt to new conditions. For instance, several alcohol manufacturers (breweries, distilleries) repurposed their production lines to manufacture hand sanitizers, addressing the sharp increase in demand while preserving jobs [10]. This swift production shift, in collaboration with government agencies and medical institutions, became an example of public-private partnerships in crisis management. Another example includes retail and service companies that expedited their transition to online business models and delivery services, allowing them to remain operational during lockdowns. Businesses that had already

invested in digital channels and e-commerce were more resilient and even strengthened their market position during the crisis [11].

Furthermore, enterprises with a well-developed risk management system and financial resilience (e.g., sufficient liquidity reserves, diversified supply chains) were better able to withstand unexpected shocks. A classic case of effective crisis management is often cited in the *Tylenol crisis (Johnson & Johnson, 1982)* - although this was primarily a reputational crisis, the swift product recall and the introduction of innovative tamper-proof packaging became a model for preventing future incidents and quickly restoring consumer trust. In the industrial sector, a notable example is *Toyota*, which, learning from supply chain disruptions following the 2011 earthquake, implemented innovative supply chain management approaches, including an early warning system for component shortages, supplier diversification, and other measures. These strategies later enabled the company to navigate the 2020–2021 global semiconductor supply crisis more resiliently.

National Level. At the national level, the success of crisis management is determined by a combination of economic policies, institutional frameworks, and preparedness for shocks. A notable example is *Poland* during the 2008–2009 global financial crisis. Poland was the only EU country to avoid recession in 2009, achieving 2.6% economic growth, while most neighboring economies faced declines [12].

Figure 1. Change in real GDP of European countries, 2007-2014 (%)



Source: [12].

This outcome resulted from a comprehensive set of measures, including: timely fiscal and monetary stimulus to maintain demand; a flexible floating exchange rate, which helped absorb external shocks; a relatively large domestic economy, reducing dependence on declining global demand.

Additional contributing factors included EU funds, export diversification, and sustained consumer and business confidence.

A particularly crucial role was played by the resilience of the banking sector - Polish banks remained profitable, well-capitalized, and did not require government assistance, even expanding lending during the crisis. While foreign banks were scaling down operations, Poland's largest state-owned bank, PKO BP, expanded lending to small and medium-sized enterprises (SMEs), counteracting the credit squeeze from private banks [12].

This is an unconventional but successful example of how a state financial institution can effectively support the economy during a crisis by acting as a countercyclical buffer.

Another example is *Estonia*, whose long-term focus on digitalization and e-government paid off during the COVID-19 pandemic. In 2020, despite a strict lockdown, 99% of government services continued to function seamlessly online Citizens were initially prepared to use electronic services (e-schools, digital healthcare, online documents, etc.), which allowed the country to avoid the paralysis of administrative functions and the emergence of a "digital divide" in public service delivery. The key to this success was long-term investment in digital infrastructure, as well as public trust in electronic services and public-private partnerships in their development [13].

Estonia's experience demonstrated that digital resilience directly contributes to economic and social security: the country was able to minimize economic decline, quickly organize remote education and work, and provide targeted assistance to citizens thanks to up-to-date electronic registries.

Examples from other countries also confirm the effectiveness of innovative strategies. The *Republic of Korea*, following the 1997–1998 Asian financial crisis, implemented structural reforms and focused on technological development, which enabled a rapid return to economic growth [14]. *Iceland*, in 2008, adopted an unconventional approach—instead of bailing out all banks, it imposed capital flow controls and allowed problematic institutions to go bankrupt, concentrating resources on protecting depositors and social obligations. As a result, within a few years, Iceland's economy recovered, although such measures were controversial [15]. Thus, successful cases demonstrate that *balanced crisis management* relies on a comprehensive approach: adaptive policies, innovation, public trust, and a willingness to take unconventional measures.

Digital transformation as a factor of crisis resilience

One of the key modern trends is the digital transformation of the economy and management processes, which has a profound impact on the ability to withstand crises. Digitalization involves the integration of digital technologies (big data, cloud computing, the Internet of Things, artificial intelligence, etc.) into all aspects of organizational and governmental activities. Research shows that digital transformation enhances organizational resilience and the ability to adapt to external challenges. For example, big data analytics and cloud platforms enable companies to identify potential risks in advance, optimize resource allocation, and improve coordination of actions in emergency situations [16; 17].

Smart manufacturing and automation reduce dependence on human factors in emergency situations, increasing process flexibility and adaptability. Together, these factors provide enterprises with the ability to respond more quickly to crisis-related changes in the external environment.

The role of digitalization has been particularly evident in supply chain management and operational activities during recent disruptions. According to experts, disruptions in global supply chains are becoming the "new normal" - major breakdowns (lasting more than a month) occur on average every 3.7 years and can cost businesses up to 45% of annual profits over a decade. Facing this reality, companies have actively started implementing digital tools to increase transparency and manageability of supply chains. For example, they use real-time monitoring systems, digital twins of logistics processes, and demand forecasting analytics, which help detect bottlenecks in advance and reconfigure supply routes. As noted in the World Economic Forum's analytical review, businesses are increasingly diversifying supply sources, localizing critical supply chain links, and investing in digital solutions to enhance visibility and analytics, essential for overcoming turbulence [18].

Thus, digital transformation in logistics has become a kind of safety shield in the era of permanent crises (permacrisis), helping businesses mitigate the impact of trade conflicts, natural disasters, or pandemics.

At the governmental level, digitalization also enhances crisis management capabilities. The example of Estonia, discussed earlier, demonstrated the value of electronic infrastructure in ensuring the continuity of public services. Other countries are also implementing digital platforms

for crisis monitoring and response, including the creation of real-time data analysis centers, public alert systems via mobile applications, and electronic platforms for distributing humanitarian aid and social payments during emergencies.

Digital government enhances transparency and control, enabling authorities to make faster, data-driven decisions. Moreover, digital tools facilitate collaboration with businesses and citizens during crises—ranging from gathering feedback (e.g., through social media or crowdsourcing solutions) to mobilizing volunteers and resources via online platforms.

However, it is important to note that digital transformation is not a panacea and comes with new risks. Some studies highlight the phenomenon of the "digital negative effect": alongside its benefits, high digitalization introduces technological and operational risks.

For example, cyberattacks or IT infrastructure failures can themselves trigger a crisis. In 2017, the NotPetya virus caused global damage, paralyzing many companies' systems—demonstrating that reliance on digital technologies requires robust cybersecurity management. Additionally, excessive automation without proper oversight can lead to unforeseen failures (e.g., algorithmic errors, software bottlenecks, and system vulnerabilities).

Thus, digital transformation must be approached with caution: while strengthening digital resilience, organizations and governments must simultaneously invest in cybersecurity, backup systems, and digital literacy training. Only a balance between innovation and risk management can ensure that digitalization genuinely contributes to economic security.

Financial innovation and crisis management policy

The financial sector traditionally plays a central role in economic crises, making financial innovation both a tool for strengthening economic resilience and a potential source of new risks. Financial innovations include new instruments, technologies, and institutions in finance - ranging from fintech platforms and cryptocurrencies to complex derivatives and unconventional lending models. The experience of recent decades illustrates the dual nature of such innovations. On the one hand, fintech solutions and digital financial services expand access to finance, reduce transaction costs, and accelerate payments, lending, and other operations. This increases financial inclusion and can act as a stabilizing factor. For example, mobile payment systems and online banking allow economic activity to continue even during lockdowns or natural disasters, ensuring transactions and financial aid distribution to the population. On the other hand, the 2008 global financial crisis demonstrated that the rapid expansion of complex financial products without adequate oversight can conceal accumulating risks and ultimately destabilize the system. Innovative securitization tools, mortgage-backed derivatives, and other new products appeared attractive before the crisis, but the hidden risks they contained led to a systemic crisis, undermining the confidence of households and businesses. Regulators and central banks learned a lesson: a balance is needed between encouraging innovation and ensuring financial stability [19].

After 2008, financial authorities introduced macroprudential regulations (increased capital requirements for banks, stress testing, and restrictions on risky operations) to reduce the likelihood of another crisis. However, with the rise of fintech, new challenges have emerged: the growth of crypto assets, decentralized finance (DeFi), and non-bank lending platforms has partially moved beyond traditional regulation, creating a shadow segment with the potential for disruptions. For example, the rapid collapse of several major cryptocurrency projects in 2022–2023 (including the bankruptcy of the FTX exchange) led to significant investor losses and demonstrated the risks of this sector to the broader financial system [20]. Research confirms that fintech development can have an ambiguous impact on financial stability: in some cases, it correlates with an increase in risks, but with effective oversight and market discipline, the negative effects can be mitigated.

In other words, the irresponsible implementation of financial innovations can lead to increased volatility and the emergence of new contagion channels for crises, while the proper use of innovations, on the contrary, can enhance resilience.

Examples of innovative financial solutions in crisis management include:

- Digital lending and business support platforms. During liquidity crises for small and medium-sized enterprises (SMEs), governments and banks launched online platforms for

expedited loan issuance, often with partial state guarantees. These platforms, integrated with tax authority databases, enabled fast application assessments and the provision of crisis loans. In the United Kingdom in 2020, the *Bounce Back Loan Scheme* with online applications issued tens of thousands of SME loans within weeks, which would have been impossible under traditional bureaucratic procedures.

- Digital currencies and payment systems. Innovations in payments—ranging from mobile wallets to central bank digital currencies (CBDCs)—can increase the resilience of payment infrastructure. For example, in several developing countries (Kenya, India), mobile money was actively used during crises to distribute social benefits, ensuring social stability. The development of instant payment systems allows central banks to conduct emergency liquidity injections into the economy in real-time.
- Capital markets and new instruments. After 2008, instruments specifically designed to cover losses during crises emerged: contingent convertible bonds (CoCos) for banks and catastrophe bonds (CAT bonds) for catastrophic risks. These innovations redistribute risks and can serve as buffers. For example, CoCos automatically convert into bank capital when financial indicators drop, helping to prevent collapses.

At the same time, financial innovations require caution. The Federal Reserve's Vice Chair for Supervision, M. Barr, notes that if regulators overly restrain innovation, the economy loses efficiency and competitiveness, but if they allow it to develop unchecked, they risk facing an uncontrollable rise in vulnerabilities [19].

It is essential to "keep up" with the market: developing smart regulatory sandboxes to test new products, strengthening risk monitoring (for example, through RegTech and SupTech - technologies for regulators), and introducing emergency protocols for crises in the fintech sector. Ultimately, financial innovations should contribute to economic security - for example, expanding access to finance and distributing risks—rather than undermining it. Achieving this requires both sound policies and international cooperation (common standards, data sharing on risks, etc.).

Artificial intelligence and predictive analytics in crisis management

Artificial intelligence (AI) deserves special attention, as it has become one of the most promising tools in crisis management in recent years. The capabilities of AI and related machine learning technologies manifest at different stages of crisis management, from early threat detection to optimizing response measures. Modern companies and government agencies are beginning to apply AI-driven predictive analytics to monitor economic and financial risks. Algorithms can analyze vast amounts of data (macroeconomic indicators, news, market behavior, social media signals) and identify patterns that precede crisis events. For example, central banks are experimenting with AI-based early warning systems for banking crises, which track unusual changes in banks' balance sheet indicators and can signal potential problems. Businesses use AI algorithms to forecast supply chain disruptions or identify bottlenecks in operations, providing time to prepare and mitigate the impact.

The application of AI has already delivered concrete results in emergency management. As noted by the World Economic Forum, AI-based systems help optimize the deployment of personnel and resources during crises. For example, the United Nations uses the EVA.ai platform to quickly select and deploy qualified specialists to crisis zones, taking into account their skills, location, and experience. Another aspect is personnel training: with augmented and virtual reality technologies, organizations create crisis simulation training programs, while AI modules personalize learning, enhancing the preparedness of response teams. [21].

Moreover, during crises, AI-based digital assistants and chatbots are used to inform the public and clients. These systems operate 24/7, answering questions and thereby reducing the burden on hotlines while improving the speed of communication. For example, during the pandemic, many governments launched chatbots in messaging apps to provide guidance on COVID-19 symptoms and safety measures. A separate aspect to highlight is the potential of generative AI and analytics in financial markets. High-frequency algorithmic trading and AI-driven credit risk assessment models have already become an integral part of the financial landscape.

These systems can react instantly to market changes, theoretically helping to smooth out sharp fluctuations. However, this also presents a risk: synchronized algorithmic actions may, on the contrary, amplify volatility. According to IMF experts, the mass adoption of AI without proper oversight poses the risk that a regular economic downturn could worsen and escalate into a deep crisis, as AI systems may simultaneously start selling off assets or cutting jobs.

The global economy has already experienced the phenomenon of a "jobless recovery" after 2008, when instead of hiring workers, companies invested in automation, causing employment recovery to lag significantly behind GDP recovery. AI risks exacerbating this trend: studies show that about 90% of job losses due to automation occur within the first year of recessions. Simply put, during crises, firms tend to replace human workers with machines to cut costs, and the more powerful AI technologies become, the more jobs may be lost in the short term. Thus, managers face a dual challenge: *maximizing the benefits of AI in crisis management while minimizing the risks of its uncontrolled impact*. To address this, experts suggest proactively developing policies and scenarios for an "AI-intensified crisis." The IMF recommends that governments start closely monitoring the scale of AI adoption across industries and conducting scenario analyses to model how mass automation could impact labor markets, financial stability, and supply chains in a crisis. Such proactive measures will help prevent "flying blind" into the next crisis and ensure that a response plan is already in place [22].

At the same time, it is crucial to develop adaptive skills within the workforce - reskilling and training in AI-related work—to mitigate the social consequences of automation. Ideally, *AI should serve as a decision-support tool* (for example, suggesting optimal crisis response measures or calculating the impact of different policies) rather than causing additional disruptions. Achieving this requires a combination of sound corporate governance (algorithm oversight, stress-testing models) and government regulation (AI transparency standards, antitrust measures against data concentration, insurance mechanisms for technological failures, etc.).

Risks and limitations of implementing new technologies

While innovative strategies and technologies create new opportunities in crisis management, it is essential to critically assess potential risks and limitations in the context of economic security:

Technological risks and vulnerability to failures. Increasing reliance on digital systems means that a technology failure can itself become a source of crisis. Cyberattacks, software errors, or power outages can paralyze critical infrastructure (banking systems, power grids, communications) precisely when it is most needed for crisis management. Major cyber incidents (such as WannaCry, NotPetya) have caused disruptions in organizations worldwide. Thus, economic security requires enhanced cybersecurity measures and backup protocols to ensure functionality in case of digital system failures.

Unintended consequences of AI. As previously noted, without proper oversight, artificial intelligence can act as a "crisis amplifier" - for example, overly aggressive trading algorithms may trigger market crashes (flash crashes), while automated workforce management systems could suddenly lay off thousands of employees, exacerbating economic downturns. Additionally, AI models often function as "black boxes," meaning their decisions may be flawed or biased, which is particularly dangerous in crisis situations. The key limitation here is the need for transparency and control over critical AI algorithms, especially those used in financial systems and government administration.

Data limitations and privacy concerns. The effectiveness of digital and AI tools depends on the availability of large volumes of high-quality data. However, crises may expose data access issues: financial institutions may be unwilling to share information, legal barriers (such as privacy laws) may restrict data usage, and there may be a lack of up-to-date data on new types of risks. Furthermore, large-scale data collection and analysis raise privacy and ethical concerns—governments must balance the need for monitoring (to detect threats early) with the protection of citizens' rights.

Socioeconomic risks of innovation. The adoption of new technologies transforms the economy and labor market. Automation and digitalization may increase unemployment among low-skilled workers if proactive measures are not taken. This, in turn, threatens social stability, a key component of economic security. Additionally, financial innovations such as crypto assets, if poorly regulated, can facilitate financial fraud, posing risks to public savings and creating reputational risks for the financial system.

Uneven adoption and the "digital divide". Not all businesses and countries have equal capabilities to adopt advanced technologies. Small firms often lag in digitalization due to limited resources, while developing countries may lack access to the latest solutions. As a result, uneven digital transformation may widen economic disparities: some players will become significantly more resilient, while others will grow more vulnerable, creating weak links in the overall system. Furthermore, if a crisis primarily affects less technologically advanced participants, it can destabilize the entire economy (e.g., a supply chain failure due to a supplier lacking digital backups could halt production).

Regulatory and legal limitations. Legislation often fails to keep pace with new technologies, creating legal uncertainty about responsibility and usage norms for innovations in crisis situations. For instance, until recently, many countries lacked clear regulations for crowdfunding platforms used for raising emergency funds. The absence of regulatory frameworks can either slow the adoption of promising tools or lead to their uncontrolled use without guarantees of effectiveness.

Considering these limitations, it is evident that an innovative crisis management approach must be accompanied by a strong risk management culture. New technologies should be integrated gradually, with stress testing in crisis scenarios. Additionally, adaptive regulation is crucial: government policies must be flexible enough to quickly respond to emerging risks without overly restricting technological progress [19].

Only under these conditions will innovations serve as a powerful tool for ensuring economic security rather than becoming a source of new threats.

Practical recommendations for implementing innovative crisis management strategies

Based on the trends and case studies reviewed, several practical recommendations can be proposed for different stakeholders - enterprises, government authorities, and financial organizations - to strengthen their crisis resilience through innovation.

For Enterprises (Businesses):

Implement proactive monitoring and analytics systems. Companies should invest in predictive analytics and business intelligence tools that enable real-time tracking of key indicators and provide early warnings of crisis trends. For example, analyzing big data on consumer and contractor behavior can help detect early signs of declining demand or impending payment defaults, allowing time to prepare.

Develop digital operational flexibility. Transitioning to digital management platforms (ERP, SCM, CRM with AI elements) will increase process transparency and facilitate rapid adjustments in response to disruptions. It is advisable to maintain backup IT systems and cloud solutions to ensure business continuity. Additionally, integrating remote and hybrid work formats will enhance resilience to localized shocks (e.g., pandemics, natural disasters).

Foster a culture of innovation and learning. Crisis periods are not a reason to halt innovation; instead, a corporate culture that encourages creativity and learning will help employees find unconventional solutions. Regular training sessions and scenario-based exercises (including simulations and VR-based training) will increase team readiness for emergencies [21].

Diversify risks and strengthen partnerships. Businesses should diversify their supplier base and sales markets to avoid over-reliance on a single source. Simultaneously, it is essential to build partnerships—both with other businesses (for crisis mutual aid and information sharing) and with the government (participating in support programs, emergency planning). Partnership networks can significantly expand the resources available to a company during a crisis.

Ensure financial stability. A strong balance sheet is the key to survival. Companies should proactively establish liquidity reserves or credit lines for crisis situations and utilize insurance tools to hedge key risks (business interruption insurance, trade credit insurance, etc.). Innovative financial products (such as parametric insurance, which provides automatic payouts based on predefined triggers) can expedite financial assistance during emergencies.

For Government Authorities:

Develop an early warning system for crises. At the national level, it is advisable to establish integrated monitoring centers that leverage big data and AI to track economic, social, and environmental indicators signaling an impending crisis (financial imbalances, epidemiological conditions, natural anomalies). These centers can aggregate data from various ministries and external sources, providing the government with a comprehensive risk assessment.

Create adaptive crisis response plans. Traditional civil defense and emergency response plans should be supplemented with scenarios addressing modern threats—cyberattacks, technological disasters, global chain reactions. Stress-testing government systems (finance, energy, telecommunications) will help identify vulnerabilities. It is also crucial to involve experts from the business and academic sectors in the development of these plans, fostering public-private dialogue in crisis preparedness.

Promote digital government and open data. As experience has shown, e-government services and digital governance platforms enhance crisis resilience [13]. It is recommended to continue digitalizing public services (especially in social welfare, healthcare, and education) and ensure their operability under extreme conditions. Publishing government data in an open format (while ensuring security) will enable businesses and researchers to develop their own risk analysis tools and policy recommendations.

Use financial technologies to support the economy. Governments and central banks should *actively apply financial innovations to enhance resilience*: implement fast payment systems for rapid distribution of social benefits and liquidity; consider launching a central bank digital currency (CBDC) to improve monetary policy effectiveness in crises; develop crowdfunding and crowd-financing platforms under government oversight to mobilize private funds for recovery (e.g., issuing "recovery bonds" through digital channels).

Enhance regulatory frameworks and governance. Governments must regularly update legislation based on global best practices to keep pace with technological advancements. This includes regulating crypto-assets (balancing control with financial system integration), cybersecurity, data protection, and establishing regulatory sandboxes for testing innovations. In labor and social policy, measures should be in place to address technology-driven employment crises (emergency reskilling programs, unemployment insurance linked to AI-driven layoffs).

For Financial Organizations:

Implement advanced risk management systems. Banks, insurance companies, and other financial institutions should integrate AI/ML models to assess customer and portfolio risks in real-time, enabling early detection of payment defaults, liquidity crises, etc. Additionally, regular stress testing should incorporate non-traditional scenarios (cyber crises, pandemics, market crashes triggered by algorithmic trading).

Develop SupTech and compliance technologies. Financial institutions should collaborate with regulators to implement SupTech solutions, which automate data collection and regulatory oversight. This will allow regulators to respond more quickly to emerging crises. Additionally, internal AI-driven compliance systems can monitor regulatory compliance and prevent excessive risk accumulation (e.g., excessive leverage or concentration in specific assets).

Diversify products and funding sources. An innovative approach involves offering customers products that enhance resilience (income-loss insurance, flexible credit lines, risk management consulting). For financial institutions themselves, it is crucial to diversify funding sources (deposits vs. capital markets vs. digital sources) and have contingency plans in case one funding channel suddenly becomes unavailable.

Participate in industry-wide cybersecurity collaborations. The financial sector is systemically important; therefore, joint exercises among banks, exchanges, and government agencies in cyberattack response can help establish rapid reaction protocols for potential destructive cyber incidents. Regular industry-wide cyber drills under the central bank's supervision can increase preparedness across all participants.

Promote financial literacy and public trust. Innovations are useless if the public does not trust them. Banks and fintech companies should invest in educating customers about new services (online investing, mobile banking, digital currencies) while ensuring data protection and transaction integrity. In times of crisis, trust is a critical intangible asset, and transparency and responsible financial management will help prevent public panic.

Collectively, these measures will create a ***more resilient and adaptive system***, capable not only of ***withstanding crisis shocks*** but also of ***leveraging stress periods for renewal and growth***.

CONCLUSION.

The *modern economy faces an unprecedented combination of risks* - ranging from financial to technological and climate-related - necessitating a *reassessment of traditional crisis management approaches*. The ***innovative crisis management strategies*** examined in this article have demonstrated their *effectiveness through real-world practices*. The use of digital technologies and AI enables a shift from *reactive to proactive crisis management*, where the focus is on prevention and early detection of problems. Financial innovations, when properly regulated, expand access to resources during difficult times and help distribute risks, supporting balanced development. Additionally, successful cases from various industries and countries highlight the importance of flexibility, cooperation, and trust - factors that cannot be built overnight but prove invaluable in times of crisis.

The key takeaway is that ***ensuring balanced economic*** security in an era of rapid change requires a combination of technological solutions and institutional innovations. Sustainability cannot be achieved by relying solely on one dimension—whether it be government regulation or market forces, technology or finance. A *systemic approach* is needed, integrating the efforts of the state, business, and society. Public-private partnerships have proven to be an effective mechanism for mobilizing resources and expertise during acute crises, and this potential should be further developed. At the same time, policy should focus on long-term recovery and development to ensure that emergency measures do not undermine the foundation for future growth.

The modern research and practical examples discussed in this article lead to several ***key conclusions***: a) digital and organizational flexibility have become as crucial as financial reserves for system resilience; b) the role of human capital and trust remains vital - technologies are only effective if people know how to use them and believe in their benefits; c) crisis prevention is economically more efficient than damage control, meaning that investments in forecasting and preparedness should not be seen as costs but as investments in security.

For future research, promising areas include deepening the study of economic security *metrics* in the digital economy (how to measure system resilience considering new factors), analyzing the behavior of complex systems under simultaneous crises (*the polycrisis effect*), and examining best global practices in risk management arising from AI and fintech adoption. The practical value of this study lies in summarizing experiences and developing concrete recommendations that can help both policymakers and business managers enhance crisis preparedness. Ultimately, ***innovative crisis management*** is a dynamic field that requires continuous learning and adaptation. Success will depend on the ability to integrate new ideas while maintaining strategic vision and balancing interests, which is the essence of balanced economic security.

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