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AN INTEGRATIVE REVIEW OF EUROPEAN CRISIS-MANAGEMENT PRACTICES WITH APPLICABILITY TO UKRAINIAN ENTERPRISES UNDER FORCE MAJEURE CONDITIONS

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An Integrative Review of European Crisis-Management Practices with Applicability to Ukrainian Enterprises under Force Majeure Conditions

The growing frequency and intensity of force majeure circumstances – including the COVID-19 pandemic, geopolitical instability, large-scale energy disruptions, and war-related shocks – have fundamentally transformed the management systems of European enterprises. This article presents an integrative review of managerial tools and adaptive strategies applied by companies in Europe and Ukraine under the impact of force majeure events between 2000 and 2025. The study synthesizes academic research, institutional reports, and practical cases to evaluate the evolution of crisis-response mechanisms and the increasing role of resilience-oriented management models. Special attention is devoted to the wartime context of Ukrainian enterprises, which demonstrates a unique combination of improvisational flexibility, rapid organisational restructuring, and accelerated digitalisation (UNDP, 2023; EBRD, 2023). Methodologically, the article is grounded in a systematic literature review, cross-crisis comparative analysis, and thematic content analysis. The findings show that adaptive planning, scenario modelling, digital transformation tools, and supply chain diversification have become essential components of crisis-management systems in European organisations (OECD, 2022; McKinsey, 2023). The study also traces the long-term evolution of managerial tools, highlighting the shift from traditional planning and benchmarking methods toward digital, agile and sustainability-focused instruments widely adopted after 2020 (Bain & Company). The article proposes an integrated resilience framework combining strategic foresight, technological innovation and organisational adaptability. The results contribute to improving crisis preparedness and strategic sustainability in both European and Ukrainian enterprises exposed to unpredictable and disruptive environments.

Keywords: force majeure; crisis management; resilience; adaptive strategies tools.

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Чепелиук М. І. Інтегративний огляд викликів антикризового управління європейським бізнесом, спричинених форс-мажорними обставинами, з можливістю застосування для українських підприємств

Зростання частоти та інтенсивності форс-мажорних обставин, включно з пандемією COVID-19, геополітичною нестабільністю, масштабними енергетичними кризами та наслідками воєнних конфліктів, суттєво трансформувало системи управління європейських підприємств. У статті представлено інтегративний огляд управлінських інструментів та адаптивних стратегій, які застосовувалися компаніями Європи та України під впливом форс-мажорних подій у період 2000–2025 рр. Дослідження узагальнює наукові праці, інституційні звіти та практичні кейси з метою оцінки еволюції механізмів антикризового реагування та зростання ролі моделей управління, орієнтованих на стійкість. Особливу увагу приділено воєнному контексту діяльності українських підприємств, який демонструє унікальне поєднання імпровізаційної гнучкості, швидкої організаційної реструктуризації та прискореної цифровізації. Методологічно дослідження ґрунтується на систематичному огляді літератури, міжкризовому порівняльному аналізі та тематичному контент-аналізі. Результати показують, що адаптивне планування, сценарне моделювання, інструменти цифрової трансформації та диверсифікація ланцюгів постачання стали ключовими складовими систем антикризового управління в європейських організаціях. У дослідженні також простежено довгострокову еволюцію управлінських інструментів – від традиційного стратегічного планування та бенчмаркінгу до цифрових, Agile- та ESG-орієнтованих підходів, які активно поширилися після 2020 року. У статті запро-

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поновано інтегровану модель організаційної стійкості, що поєднує стратегічне прогнозування, технологічні інновації та організаційну адаптивність. Отримані результати сприяють підвищенню готовності до кризових ситуацій та забезпеченню стратегічної стійкості як європейських, так і українських підприємств, що функціонують в умовах непередбачуваного та дестабілізуючого середовища.

Ключові слова: форс-мажор; антикризове управління; стійкість; адаптивні стратегії; управлінські інструменти.

Табл.: 3. Формул.: 1. Бібл.: 15.

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The contemporary European business environment is characterised by increasing complexity, volatility and exposure to unexpected global shocks. Over the past two decades, enterprises have faced a range of force majeure circumstances, including the global COVID-19 pandemic, geopolitical instability, military aggression against Ukraine, large-scale disruptions in global supply chains and the energy crisis, which collectively created long-term structural pressures on managerial systems. These events demonstrated the fragility of traditional organisational models and highlighted the necessity of advanced adaptive and resilient management approaches [11]. Even large companies with robust infrastructure faced significant operational disruptions, signalling that in the modern world stability is no longer the norm but rather an episodic condition.

The academic community increasingly emphasises the relevance of studying strategic adaptation in turbulent environments, as the capacity to respond to unexpected external shocks has become a key determinant of enterprise sustainability [8]. Scholars note that managerial flexibility, rapid decision-making, continuous monitoring of external threats and the ability to integrate digital technologies into organisational processes are now among the most important competencies of modern enterprises [7]. Therefore, an integrative analysis of how European and Ukrainian companies adapt their management systems to force majeure disruptions is particularly timely.

Force majeure in this study is conceptualised according to international legal frameworks as a set of unforeseeable, external, and uncontrollable events that make it impossible or extremely difficult for enterprises to operate under normal conditions [14]. The selected research period of 2000–2025 covers the most significant crises that have reshaped managerial systems in Europe and Ukraine, including global pandemics, geopolitical conflicts, economic shocks, and large-scale energy disruptions. This time frame allows for the examination of both long-term structural transformations and short-term adaptive responses, providing a coherent basis for analysing the evolution of crisis-

management practices. The period 2000–2025 encompasses the most relevant crises that reshaped business management in Europe and Ukraine.

Literature review and analysis of previous studies. A comprehensive review of academic sources reveals that crisis-driven transformation has become a central topic in management, economics, and organisational studies. The COVID-19 pandemic generated unprecedented disruptions and stimulated the formation of new research directions related to digitalisation, remote work, resilience building, and behavioural changes within organisations [10]. Empirical studies indicate that enterprises with pre-existing digital infrastructure, flexible organisational cultures, and proactive crisis management capabilities were better positioned to preserve productivity, maintain strategic continuity, and adapt quickly to changing conditions despite strict lockdown measures [11]. Scholars note that digital transformation in multiple sectors – including logistics, retail, healthcare, and education – was accelerated by five to seven years, highlighting a rapid convergence of technological adoption and strategic realignment.

The European energy crisis has further intensified academic interest in enterprise adaptation. Research from Poland, Czech Republic, Romania, Germany, and the Baltic States emphasizes the critical role of energy risk assessment, cost optimisation strategies, and restructuring of production processes to reduce dependency on imported energy resources [4]. These studies demonstrate that energy uncertainty acts as a fundamental driver of organisational change, encouraging firms to pursue sustainable, diversified, and technologically innovative solutions. For instance, the integration of renewable energy sources, energy-efficient production technologies, and smart grid solutions are increasingly framed as strategic imperatives rather than operational options.

Geopolitical disruptions – particularly the Russian invasion of Ukraine – have generated a significant body of literature addressing crisis governance under extreme conditions. Studies highlight the operational

challenges faced by Ukrainian enterprises, including forced relocation, logistics breakdowns, security threats, workforce displacement, and infrastructure destruction [14]. Despite these severe challenges, Ukrainian companies demonstrated remarkable resilience, implementing emergency management systems, reorganising supply chains, and developing remote operational capabilities within extremely short time frames [6]. This context provides a unique empirical basis for examining how managerial instruments evolve under conditions of continuous, high-level uncertainty and how adaptive strategies can be generalised to other high-risk environments.

Classical management theories continue to retain their significance in understanding organisational response mechanisms. Strategic frameworks developed by Ansoff [1], Porter [12], Drucker, and Mintzberg provide foundational insights into organisational adaptability, competitive advantage, and structural redesign. Modern scholars increasingly integrate these traditional approaches with contemporary conceptions such as organisational resilience, digital transformation, and dynamic capabilities [13]. This synthesis underscores the necessity for management theory to evolve in response to a world where crises are systemic rather than exceptional, demanding a proactive rather than reactive orientation.

Recent literature also highlights the intersection of human resource management and technological adaptation. Studies suggest that employee engagement, skill development, and flexible work arrangements significantly mediate the success of digital transformation initiatives during crises [4]. Furthermore, research into cross-sector collaboration and knowledge-sharing networks demonstrates that enterprises embedded in robust professional ecosystems are better able to access timely information, mobilise resources, and implement innovative solutions during periods of disruption [11].

Overall, the literature review indicates a convergence of three critical themes: the acceleration of digital transformation, the growing importance of resilient organisational structures, and the strategic integration of classical management theory with dynamic crisis-response practices. This convergence provides a strong conceptual and empirical foundation for analysing the adaptive strategies of European and Ukrainian enterprises in the face of complex, multi-dimensional crises.

Research aim and methods. This study employs an integrative research design aimed at analysing how European and Ukrainian enterprises adjust managerial practices under force majeure conditions, including pandemics, geopolitical disruptions, large-scale energy shocks, and wartime uncertainty. The research

adopts a mixed approach, combining qualitative analytical techniques with structured comparative assessment. The dataset consists of academic publications, institutional policy documents, sectoral reports, case studies of enterprises, and statistical materials covering the period 2000–2025, which reflects the major crises that reshaped business management in Europe and Ukraine [11; 14].

To ensure comprehensive temporal coverage, the research period is divided into two distinct intervals. The first interval, from 2000 to 2019, represents the pre-crisis trajectory of managerial development, allowing for an examination of baseline managerial models before the profound disruptions caused by COVID-19, the European energy crisis, and the escalation of military aggression against Ukraine. The second interval, from 2020 to 2025, captures the period of intensive crisis-driven transformation and provides empirical grounding for analysing managerial adaptations under force majeure conditions. This division follows methodological recommendations common in crisis-management studies, enabling comparison between stable and highly volatile environments [11].

The data used in this study originate from internationally recognised institutions, including the OECD, World Bank, UNDP, EBRD, European Commission, and national statistics services. In addition, the analysis incorporates sectoral reports from leading consulting firms such as McKinsey, Deloitte, BCG, and KPMG as well as peer-reviewed academic research [2; 4; 6; 10; 11]. *Tbl. 1* presents the operational definitions of the key analytical categories used in the study.

In this study, two complementary methodological approaches are applied: a qualitative approach and a structured comparative crisis analysis. The qualitative approach involves examining shifts in managerial strategies, identifying emerging patterns of enterprise behaviour, and tracing the evolution of adaptation tools across different crisis contexts. Through in-depth thematic coding, the study identifies clusters of managerial responses, including digitalisation, supply-chain diversification, organisational decentralisation, and sustainability-driven resilience mechanisms [15].

The comparative crisis analysis enables the identification of both short-term and long-term transformations in enterprise management. By comparing organisational behaviour across three major crises – COVID-19, the European energy crisis, and wartime disruptions in Ukraine – the study reveals cross-crisis regularities and unique country-specific trajectories. This approach also makes it possible to distinguish proactive restructuring (e. g., digital upgrades, ESG integration) from reactive crisis-response measures (e. g., relocation, emergency logistics) [4; 14].

Table 1

Operational definitions of key analytical categories

Analytical category	Definition	Unit of analysis	Data sources
Force majeure conditions	Unpredictable external events that disrupt normal enterprise operations (pandemics, wars, geopolitical shocks, energy crises)	Crisis type	UNCTAD, OECD, UNDP
Managerial adaptation tools	Strategic, operational, and technological instruments introduced to maintain continuity during crises	Organisational practice	McKinsey, Deloitte, BCG, academic literature
Resilience mechanisms	Structural and behavioural capabilities enabling organisations to absorb shocks and recover	Mechanism/attribute	Teece (2015), OECD
Digital transformation	Adoption of digital technologies to enhance flexibility, coordination, and business continuity	Technology/ process	EBRD, World Bank, company case studies
Supply-chain reconfiguration	Adjustments in sourcing, logistics, and distribution to mitigate disruption risks	Operational structure	KPMG, sectoral reports
Organisational restructuring	Leadership, governance, and structural changes under crisis conditions	Organisational model	UNDP, empirical case studies

Source: compiled by the author based on [10; 11; 14].

The analytical framework of the study is structured to evaluate how force majeure circumstances influence managerial transformation. The logic of the model is presented below:

$$AM_i = \alpha_0 + \alpha_1 FD_i + \alpha_2 DT_i + \alpha_3 SC_i + \alpha_4 OR_i + \varepsilon_i, \quad (1)$$

where:

AM_i – the resulting transformation of managerial models;

FD_i – force majeure drivers (pandemic, military conflict, energy shock);

DT_i – digital transformation intensity;

SC_i – supply-chain restructuring intensity;

OR_i – organisational restructuring changes;

ε_i – emergent contextual influences (sectoral specifics, institutional environment).

The coefficients $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$ / α_0 , / α_1 , / α_2 , / α_3 , / α_4 represent the direction and hypothetical magnitude of influence of each factor on management transformation.

– α_0/α_0 denotes the baseline level of adaptive transformation in the absence of external shocks;

– α_1/α_1 reflects the incremental effect of force-majeure factors;

– α_2/α_2 indicates the contribution of digitalisation processes;

– α_3/α_3 captures the influence of supply-chain restructuring;

– α_4/α_4 expresses the impact of organisational restructuring measures.

Although the coefficients are not statistically estimated within this qualitative framework, they serve as conceptual parameters, helping to formalise causal logic and clarify the relative role of each variable within the integrative analytical model [3]. This conceptual equation does not provide statistical estimation; rather, it serves as a structural framework guiding qualitative interpretation.

The empirical analysis proceeds through three main stages:

1. Identification and screening of sources.

Documents were selected based on relevance, regional applicability (Western Europe, Eastern Europe, Ukraine), methodological soundness, and empirical depth. This ensured that both macro-level studies and firm-level examinations were included.

2. Thematic content analysis. Using an inductive coding strategy, the study identified thematic clusters representing managerial adaptation patterns. These included digitalisation, workforce restructuring, leadership flexibility, supply-chain redesign, and resilience-oriented strategic planning.

3. Cross-crisis comparative analysis. This stage synthesised findings across the COVID-19 crisis, the energy crisis, and wartime conditions to assess their cumulative impact on managerial tools. The comparative lens reveals not only common resilience mechanisms but also the unique improvisational strategies developed by Ukrainian enterprises under extreme uncertainty.

The combination of qualitative and comparative methods ensures methodological robustness and allows for the development of a comprehensive analytical perspective. However, limitations arise due to the evolving wartime context in Ukraine, incomplete reporting in some sectors, and the variable availability of firm-level data. Despite these constraints, the integrative method enables a rigorous examination of managerial transformations under force majeure conditions [14].

Research results. The findings of the integrative review demonstrate that European and Ukrainian enterprises have undergone profound transformations in their managerial tools, organisational structures, and strategic priorities in response to force majeure circumstances. These adaptations are multi-dimensional, involving technological, operational, and human-resource aspects, which collectively enhance organisational resilience [8; 13].

During the COVID-19 pandemic, digitalisation became a critical enabler of business continuity across Europe. Enterprises rapidly adopted remote management systems, cloud-based platforms, and automated service delivery processes to maintain operational functionality. Flexible work arrangements, virtual collaboration tools, and enhanced digital communication channels facilitated uninterrupted workflow and minimized productivity loss. In many cases, IT investments, cybersecurity improvements, and data analytics integration progressed by five to seven years within a matter of months [10; 15]. Ukrainian enterprises, facing both pandemic-related restrictions and wartime disruptions, rapidly deployed digital platforms for logistics, supply chain management, and customer engagement. This allowed them to maintain operations despite infrastructure damage, workforce displacement, and regional instability. Companies such as Rozetka and Nova Poshta successfully implemented e-commerce platforms, automated delivery tracking, and AI-driven demand forecasting, demonstrating improvisational flexibility and high technological adaptability [14].

Force majeure circumstances exposed the vulnerabilities of traditional supply chains, particularly during the European energy crisis. Companies responded by optimising resource consumption, diversifying suppliers, and restructuring production inputs. Firms shifted from single-source long-term contracts toward multi-tier supplier networks incorporating regional and global partners. Scenario planning and risk mapping became standard practices, enabling proactive identification of potential disruptions [4; 13]. In Ukraine, wartime conditions necessitated not only diversification but also real-time reconfiguration of logistics and local sourcing. For example, enterprises in the food processing and manufacturing sectors devel-

oped modular logistics networks, allowing production to shift between facilities and regions in response to security threats, demonstrating a combination of operational improvisation and strategic foresight [9].

Organisational restructuring was another critical adaptation. European companies embedded flexibility within formal crisis-management frameworks, adjusting leadership roles to enhance cross-functional coordination, decision-making speed, and internal communication. Ukrainian enterprises, operating under systemic uncertainty, relied on decentralised decision-making and distributed leadership. Emergency task forces, flexible reporting lines, and dynamic resource allocation allowed firms to respond to rapidly changing conditions. These approaches illustrate that resilience often emerges from combining formal management instruments with informal, context-driven problem-solving practices [3].

Sustainability and resilience increasingly converge as strategic priorities. European enterprises incorporate environmental, social, and governance (ESG) principles into crisis-response strategies, using energy diversification, circular economy practices, and renewable infrastructure investment to strengthen operational robustness. Ukrainian businesses, despite wartime constraints, have adopted similar approaches. Investments in energy-efficient production processes and local renewable resources have reduced dependency on unstable national grids, demonstrating that long-term sustainability can serve as a resilience mechanism during crises [5; 7].

To provide a comprehensive overview of how management tools have evolved in response to emerging crises, *Tbl. 2* summarises the top management tools used from 1993 to 2025, highlighting trends in adoption rates and strategic focus. The table illustrates the gradual transition from traditional instruments – such as mission and vision statements, benchmarking, and customer satisfaction – to modern tools like digital transformation, AI/ML, agile practices, and ESG integration.

The *Tbl. 2* demonstrates [3] that, while early management approaches focused primarily on organisational structure, quality improvement, and operational efficiency, many of these foundational tools continue to influence managerial practices today. Elements such as Strategic Planning, Benchmarking and Customer Experience remain present across multiple periods because they form the core logic of efficient management and evolve together with new technologies rather than disappear.

At the same time, the introduction of digital tools, data-driven capabilities, and sustainability-oriented strategies has become central to contemporary crisis management. The table illustrates how organi-

Table 2

Analysis of top management tools for 1993–2025

Year	Top 5 tools	% usage	Key trends
1993	Mission/Vision Statements; Customer Satisfaction; TQM; Competitor Profiling; Benchmarking	88; 86; 72; 71; 70	Focus on organisational structure and basic management processes
2000	Strategic Planning; Mission/Vision; Benchmarking; Outsourcing; Customer Satisfaction	76; 70; 69; 63; 60	The growing role of strategic planning and development
2014	CRM; Benchmarking; Employee Engagement; Strategic Planning; Outsourcing	46; 44; 44; 44; 41	Focus on customers and staff, the beginning of digitalisation
2017	Strategic Planning; CRM; Benchmarking; Advanced Analytics; Supply Chain	48; 48; 46; 42; 40	Development of analytics and digital tools
2026	Digital Transformation; AI/ML; Agile; ESG; Customer Experience	Forecast	Digitalisation, sustainability

Source: compiled by the author based on [2; 10].

sations gradually shifted from traditional quality-focused instruments in the 1990s to analytics-based, customer-centric, and technologically enhanced tools in the 2010s, and finally to AI-powered, agile, and ESG-integrated models by 2025.

This persistence of earlier tools, combined with the rise of advanced digital instruments, underscores the accelerating pace of change: technological adoption, analytical capabilities, artificial intelligence, and sustainability considerations are now embedded into core strategic planning. As a result, enterprises are compelled to remain agile, adaptive, and resilient in highly unpredictable environments, aligning both long-standing management practices and emerging technologies to strengthen decision-making and operational stability (*Tbl. 3*).

A cross-crisis analysis reveals universal mechanisms that support enterprise resilience. Scenario planning and risk assessment improve preparedness, digital transformation facilitates continuity and adaptive coordination, supply chain diversification reduces vulnerability, flexible organisational design enables rapid reconfiguration, and engaged leadership ensures timely execution of strategies [13; 10]. These mechanisms are mutually reinforcing: digital tools enhance supply chain visibility, scenario planning informs organisational restructuring, and proactive leadership amplifies the efficiency of structural adaptations.

The Ukrainian experience provides particularly valuable insights. Extreme constraints and persistent uncertainty have acted as catalysts for innovation, accelerating adoption of digital tools, decentralised management practices, and adaptive supply chain

Table 3

Trends in top management tools, 1993–2025

Year	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5
1993	Mission/Vision	Customer Satisfaction	TQM	Competitor Profiling	Benchmarking
2000	Strategic Planning	Mission/Vision	Benchmarking	Outsourcing	Customer Satisfaction
2014	CRM	Benchmarking	Employee Engagement	Strategic Planning	Outsourcing
2017	Strategic Planning	CRM	Benchmarking	Advanced Analytics	Supply Chain
2025	Digital Transformation	AI/ML	Agile	ESG	Customer Experience
2026 (prognosis)	Decision Intelligence	Crisis & Resilience Management Systems	Autonomous Process Automation	Cybersecurity & Risk Analytics	Sustainable Value Creation

Source: Bain & Company. Management Tools & Trends [2].

strategies. These lessons demonstrate that enterprises capable of integrating strategic foresight, technological innovation, and organisational flexibility are better positioned to withstand both predictable and unprecedented disruptions [14; 5].

Influence of Force-Majeure Drivers (α_1)

The findings strongly support the assumption that force-majeure drivers (*FD*) exert a direct and substantial influence on adaptive management transformation. The coefficient α_1 reflects the degree to which crisis intensity accelerates the need for managerial change, and empirical evidence confirms its decisive role.

During the COVID-19 pandemic, firms faced disruptions in mobility, labour availability, and market demand, leading to rapid adoption of remote management tools and emergency operational protocols [14; 10]. The European energy crisis triggered immediate responses related to energy substitution, cost optimisation, and process automation [4]. Wartime disruptions in Ukraine demonstrated the most extreme expression of α_1 : enterprises were forced to relocate production, rebuild logistics routes, and redesign resource flows to ensure survival [14]. Thus, α_1 represents the catalysing effect of external shocks. The stronger the disruption, the faster organisations restructure their managerial, operational, and technological systems [8].

Impact of Digital Transformation (α_2)

The coefficient α_2 , representing the contribution of digital transformation (*DT*), was among the most influential in the empirical evidence. Digital tools consistently enabled continuity, coordination and efficiency during all crises analysed [10; 6].

European enterprises advanced cloud systems, virtual collaboration environments and automated customer service to maintain productivity during COVID-19. The energy crisis accelerated investment in smart energy management systems and predictive analytics. In Ukraine, the wartime context revealed the highest value of α_2 : digital tools substituted physical infrastructure, allowed dispersed teams to operate and ensured communications stability despite logistical fragmentation [14]. Digitalisation acted not as a single adaptation measure but as a systemic enabler that strengthened supply-chain visibility, informed scenario planning and supported organisational restructuring [8; 13].

Role of Supply-Chain Restructuring (α_3)

The influence of supply-chain restructuring (*SC*), expressed through α_3 , is confirmed by multiple crisis contexts. The European energy crisis exposed supply vulnerabilities, prompting firms to diversify suppliers, shift to regional and nearshoring strategies, and redesign procurement structures [4; 13]. Similarly, wartime

disruptions in Ukraine required real-time logistics reconfiguration and modular production models capable of relocating geographically as conditions changed [9].

The empirical evidence demonstrates that firms with more flexible and diversified supply-chain structures exhibited higher resilience and maintained operational continuity longer. Therefore, α_3 reflects the stabilising and risk-reducing function of supply-chain restructuring. It also interacts positively with α_2 , as digital tools enhance supply-chain monitoring and coordination [10; 6].

Significance of Organisational Restructuring (α_4)

Organisational restructuring (*OR*), captured by the coefficient α_4 , proved essential in enabling rapid response and strategic flexibility. European enterprises formalised crisis-management roles, strengthened cross-functional teams, and increased decision-making speed. Ukrainian firms implemented decentralised leadership systems, distributed authority and agile resource allocation in response to unpredictable wartime threats.

These practices demonstrate that formal and informal organisational adjustments are critical to resilience. The value of α_4 is therefore particularly strong in the environments with high uncertainty, where rigid structures hinder timely decision-making. The findings confirm that adaptive organisational architecture significantly enhances a firm's capacity to implement technological and supply-chain changes, supporting the interconnected nature of the model.

Synergistic Effects and Model Validation

The cross-crisis analysis shows that adaptive management transformation is generated not by any single factor, but by the synergistic interaction of the four components. Force-majeure shocks initiate change (α_1), digital tools accelerate it (α_2), supply-chain flexibility stabilises operations (α_3), and organisational restructuring enables coherent implementation (α_4). These mutually reinforcing relationships validate the conceptual model and demonstrate that resilience emerges from a multidimensional, systemic process rather than isolated adaptations.

A number of Ukrainian enterprises provide clear evidence of how adaptive strategies were operationalised under extreme conditions. Logistics operators such as Nova Poshta introduced mobile sorting terminals, modular warehouses and automated routing systems, ensuring continuity of delivery services despite constant security threats and infrastructural instability. Large e-commerce platforms including Rozetka expanded cloud infrastructure, strengthened cybersecurity protocols and adopted AI-based demand forecasting tools. Manufacturing and agribusiness

companies reorganised production through decentralised facilities, localised supply chains and energy-autonomous units using renewable generation. The resilience of Ukraine's IT sector further demonstrates the efficiency of decentralised workforce models, rapid internal mobility and advanced digital collaboration ecosystems [14; 5].

Applying model (1) to Ukrainian enterprises demonstrates that the transformation of managerial models is simultaneously driven by emergency pressures (FD_i) and by proactive strategic initiatives (DT_i , SC_i , OR_i). In practice, companies that invest in digitalisation and organisational flexibility show higher adaptive transformation even under severe force-majeure circumstances. Conversely, firms with low intensity of restructuring lag behind in adaptation despite facing the same external shocks.

CONCLUSIONS

Force majeure circumstances – including pandemics, military conflicts, and energy crises – have become key factors influencing the long-term development of European and Ukrainian enterprises. Traditional stability-oriented management models are increasingly inefficient under conditions of uncertainty and systemic risk. Modern resilience therefore requires adaptive planning, digital technologies, flexible governance, and diversified supply chains.

The findings demonstrate that enterprises implementing digital platforms, analytics-based decision systems, agile practices, and sustainability frameworks are more capable of absorbing shocks and maintaining operational continuity. Digitalisation plays a particularly important role by supporting real-time coordination, automated processes, and strategic flexibility during crises.

Equally important are decentralised governance structures and flexible organisational models that improve responsiveness and decision-making speed. Ukrainian enterprises, operating under wartime conditions, accelerated managerial modernisation through digital communication tools, adaptive logistics, and flexible workforce practices. These experiences provide valuable lessons for European businesses facing systemic disruptions.

The study confirms that resilience is not an isolated capability but a systemic result of technological readiness, organisational flexibility, and sustainability-oriented strategies. Enterprises should therefore integrate resilience principles into all levels of strategic planning rather than treat crisis management as a temporary measure.

Practically, the research recommends investing in digital infrastructure, developing contingency

plans, strengthening ESG integration, and diversifying supply chains. Such measures increase organisational adaptability and support long-term competitiveness in environments shaped by force majeure events. ■

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