МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

КИЇВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ТЕХНОЛОГІЙ ТА ДИЗАЙНУ

МЕНЕДЖМЕНТ

№ 1 (43), 2026

DOI: 10.30857/2415-3206.2026.1

Наукове видання

Періодичність виходу журналу: 2 рази на рік

Київ 2026

Журнал «Менеджмент» є науковим виданням Київського національного університету технологій та дизайну як правонаступника Державного вищого навчального закладу «Міжгалузева академія управління» (наказ Міністерства освіти і науки України від 19.06.2015 р. №661 «Про реорганізацію державного вищого навчального закладу «Міжгалузева академія управління»)

№ 1 (43) 2026	Свідоцтво про державну реєстрацію друкованого засобу масової інформації: серія КВ №22130–12030 ПР від 16.05.2016 р. Журнал зареєстровано як суб'єкт у сфері друкованих медіа – ідентифікатор R30-05425 (Рішення Національної Ради від 08.08.2024 р. №2520). Свідоцтво суб'єкта видавничої справи: ДК № 993 від 24.07.2002 р.
	Журнал входить до переліку наукових фахових видань. Наказ МОН України від 18.12.2018 № 1412 (додаток 10, рішення щодо присвоєння Категорії Б) – фаховість із економічних наук. Спеціальності: 051, 071, 072, 073, 075, 076, 241, 281.
ISSN 2415-3206	Журнал зареєстровано в Міжнародному центрі періодичних видань (ISSN International Centre, Париж, Франція) 24.03.2016 р. Журнал реферується та індексується у наступних міжнародних базах даних: International DOI Foundation, CrossRef, WorldCat, Google Scholar, Національна бібліотека України імені В.І. Вернадського, Інституційний репозитарій Київського національного університету технологій та дизайну
Правонаступник і видавець:	Київський національний університет технологій та дизайну Україна, 01011, м. Київ, вул. Мала Шияновська, 2
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Тематична спрямованість журналу «Менеджмент»: економіка, менеджмент соціокультурної діяльності; облік і оподаткування, фінанси, банківська справа та страхування, менеджмент, публічне управління та адміністрування, маркетинг, підприємництво, торгівля та біржова діяльність.

Видання орієнтоване на науковців, викладачів, аспірантів, студентів, а також науково-практичних працівників і фахівців відповідних галузей промисловості.

Кривонос Олена Олександрівна – відповідальний секретар.

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Рекомендовано до друку Вченою радою Київського національного університету технологій та дизайну, протокол № 4 від 29.05.2026 р.

Матеріали друкуються змішаними мовами: англійською, польською. Відповідальність за переклад, достовірність фактів, цитат, власних імен, географічних назв, назв підприємств, організацій, установ та іншої інформації несуть автори статей. Передруки та переклади статей дозволяються лише за згодою автора (-ів) та редакції.

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

KYIV NATIONAL UNIVERSITY
of TECHNOLOGIES and DESIGN

MANAGEMENT

Issue 1 (43), 2026

DOI: 10.30857/2415-3206.2026.1

Scientific publications

Issued: 2 times a year

Kyiv 2026

Journal "Management" is a scientific edition of Kyiv National University of Technologies and Design as a successor of State higher educational institution "Interbranch Management Academy" (order of Ministry of Education and Science of Ukraine from 06.19.2015 №661 «About reorganization of state higher educational institution" Interbranch Management Academy")

Issue 1 (43) 2026	**Certificate of print media registration: KV series №22130–12030 PR from 16.05.2016** **The magazine is registered as an entity in the field of print media – identifier R30-05425 (Decision of the National Council dated August 8, 2024 No. 2520).** **License for publishing activity is DK №993, originating date 24.07.2002**
	The journal is listed & reregistered in Higher Attestation Commission of Ukraine: № 1412, originating date 18.12.2018. Fields: economical. Specialties: 051, 071, 072, 073, 075, 076, 241, 281.
ISSN 2415-3206	The journal is registered in the International Center of periodicals (ISSN International Centre, Paris, France) 03.24.2016 The journal is abstracted and indexed by International DOI Foundation, CrossRef, WorldCat, Google Scholar, The Vernadsky National Library of Ukraine, Kyiv National University of Technologies and Design Institutional Repository
Assignee and publisher:	**Kyiv National University of Technologies and Design** **Ukraine, 01011, Kyiv, str. Mala Shyianovska, 2**
Editor deputy:	**Liudmyla M. Hanushchak-Yefimenko** – Dr., professor, Laureate of the Prize of the Verkhovna Rada of Ukraine for young scientists, Laureate of the Boris Paton National Prize of Ukraine.

Journal "Management" focuses on: economics, management of social and cultural activities; accounting and taxation, finance, banking and insurance, management, public management and administration, marketing, business, trade and exchange activities.

The journal is aimed at a wide range of researchers, professors, students, and graduate students and to bring the results of scientific research carried out under a variety of intellectual traditions and organizations of procedures to the attention of a specialized readership.

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01011, m. Kyiv, str. Mala Shyianovska, 2, Bldg. 1, cabinet 347
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Recommended for publication by the Academic Council of Kyiv National University of Technologies and Design, protocol № 4 from 29.05.2026

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Journal "Management"

ВІДОМОСТІ ПРО ЧЛЕНІВ РЕДАКЦІЙНОЇ КОЛЕГІЇ
наукового журналу «Менеджмент»

DOI: 10.30857/2415-3206.2026.1

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JEL Classification: O15

UDC 005.95/.96(477)

DOI: 10.30857/2415-3206.2026.1.1

FEATURES OF HUMAN RESOURCE MANAGEMENT IN THE SOCIOCULTURAL SPHERE UNDER MARTIAL LAW

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PRESENTATION AND PURPOSE OF THE STUDY. The full-scale war in Ukraine has caused dramatic changes in all areas of public life, including the sociocultural sphere. Institutions in this sector face not only economic and logistical challenges, but also critical issues in human resource management. The instability of the external environment, forced displacement, emotional burnout, staff shortages, and the need to adapt to crisis conditions have significantly affected HR processes. Under martial law, personnel management requires new strategies that combine flexibility, resilience, and psychological support for employees. The purpose of this article is to analyze the peculiarities of personnel management in the sociocultural sphere under martial law and to identify effective approaches to maintaining performance and team cohesion in such extreme conditions.

RESEARCH METHODS. The article applies general scientific and special methods, including analysis, synthesis, comparison, systemic approach, expert evaluation, situational modeling, and SWOT analysis. These tools allowed for the identification of key trends, risks, and adaptive management mechanisms within cultural and social institutions operating during wartime.

THE RESULTS. The study emphasizes that effective HR management during martial law should focus on psychological resilience, team motivation, flexible forms of employment, decentralization of decision-making, and the introduction of digital tools for remote coordination and communication. The article also highlights the importance of leadership skills, empathy, and trust in team interactions. Institutions that demonstrated proactive HR policies were better able to retain staff, preserve institutional memory, and ensure service delivery continuity. Specific attention was given to the development of support programs for internally displaced cultural workers and the implementation of short-term contracts and volunteer-based staffing models.

CONCLUSIONS. In wartime conditions, personnel management in the sociocultural sphere becomes a factor of institutional survival. The ability to quickly reorganize workflows, maintain employee morale, and implement adaptive leadership models is critical. The experience of wartime HR practices may lay the foundation for a new, more resilient model of public management in Ukraine's cultural and social sectors. Strategic investment in human capital, emotional intelligence, and agile organizational structures is key to sustainability in crisis conditions.

KEYWORDS: sociocultural sphere; human resource management; martial law; crisis leadership; motivation; staff adaptation; digital tools; institutional resilience.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
9	0	1

Received: 12.11.2025	*Revised: 24.12.2025*	*Accepted: 29.05.2026*	*Published: 01.06.2026*

JEL Classification: O15

UDC 005.95/.96(477)

DOI: 10.30857/2415-3206.2026.1.1

ОСОБЛИВОСТІ УПРАВЛІННЯ ПЕРСОНАЛОМ СОЦІОКУЛЬТУРНОЇ СФЕРИ В УМОВАХ ВІЙСЬКОВОГО СТАНУ

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ВИСТУП І МЕТА ДОСЛІДЖЕННЯ. Повномасштабна війна в Україні спричинила кардинальні зміни у всіх сферах суспільного життя, зокрема в соціокультурній сфері. Установи цієї галузі стикаються не лише з економічними та логістичними викликами, а й із гострими проблемами в управлінні персоналом. Нестабільність зовнішнього середовища, вимушене переміщення, емоційне вигорання, кадровий дефіцит і необхідність адаптації до кризових умов суттєво вплинули на HR-процеси. В умовах воєнного стану управління персоналом потребує нових стратегій, які поєднують гнучкість, стійкість і психологічну підтримку працівників. Мета статті – проаналізувати особливості управління персоналом у соціокультурній сфері в умовах воєнного стану та визначити ефективні підходи до збереження працездатності та командної згуртованості в умовах надзвичайної ситуації.

МЕТОДИ ДОСЛІДЖЕННЯ. У процесі написання статті використовувалися загальнонаукові та спеціальні методи: аналіз, синтез, порівняння, системний підхід, експертне оцінювання, ситуаційне моделювання, SWOT-аналіз. Застосування цих інструментів дозволило виявити основні тенденції, ризики та адаптивні механізми управління в умовах роботи соціокультурних установ у період війни.

РЕЗУЛЬТАТИ. У статті наголошується, що ефективне управління персоналом в умовах воєнного стану має ґрунтуватися на психологічній стійкості, мотивації команди, гнучких формах зайнятості, децентралізації прийняття рішень і впровадженні цифрових інструментів для дистанційної координації та комунікації. Акцент зроблено на ролі лідерства, емпатії та довіри у взаємодії з колективом. Установи, які впроваджували проактивну HR-політику, краще зберегли кадри, інституційну пам’ять і стабільність надання послуг. Особливу увагу приділено підтримці внутрішньо переміщених працівників культури, впровадженню короткострокових контрактів та моделей волонтерської зайнятості.

ВИСНОВКИ. В умовах війни управління персоналом у соціокультурній сфері стає чинником виживання установ. Здатність оперативно реорганізовувати робочі процеси, підтримувати моральний дух працівників і впроваджувати адаптивне лідерство має ключове значення. Досвід військового періоду може стати основою нової, стійкої моделі управління у сфері культури й соціальної політики України. Стратегічні інвестиції в людський капітал, емоційний інтелект і гнучкі організаційні структури є запорукою життєздатності в умовах кризи.

КЛЮЧОВІ СЛОВА: соціокультурна сфера; управління персоналом; воєнний стан; кризове лідерство; мотивація; адаптація персоналу; цифрові інструменти; інституційна стійкість.

Introduction. The sociocultural sphere plays a crucial role in shaping national identity, preserving cultural heritage, and fostering community resilience-functions that become especially vital during times of war. Under conditions of martial law, institutions in this field face unprecedented challenges that extend beyond material destruction or budget constraints. One of the most pressing and complex issues is the management of human resources. Wartime realities-displacement, emotional trauma, loss of personnel, shifting priorities, and heightened uncertainty-require a fundamentally different approach to staffing, leadership, motivation, and organizational behavior.

Effective human resource management (HRM) in the sociocultural sphere under martial law must go beyond traditional administrative frameworks. It must evolve into a dynamic, flexible, and humane system capable of responding to rapidly changing conditions. Institutions in this sector, such as libraries, museums, cultural centers, and arts organizations, are not just service providers-they are carriers of national memory and tools of psychological resistance. Their ability to operate and support the public directly depends on the well-being, motivation, and professional capacity of their staff.

Furthermore, the wartime context necessitates the redefinition of institutional goals and the adaptation of HR strategies to new realities. These may include a shift toward digital formats, decentralized management, hybrid work models, and the integration of psychological support systems. Staff members often work under conditions of high emotional stress and personal risk, making the human factor a central consideration in managerial decision-making. At the same time, the need for institutional continuity, innovation, and societal impact remains as urgent as ever.

Human capital becomes not only a resource but a critical asset that determines the survival and resilience of sociocultural institutions. Accordingly, effective HRM in this period must integrate elements of crisis management, emotional intelligence, strategic communication, and scenario-based planning. This includes identifying key personnel, supporting displaced workers, preserving institutional memory, and fostering adaptive leadership.

The introduction of innovative HR practices, such as digital communication tools, remote collaboration platforms, and rapid skills training, can significantly enhance the resilience of organizations operating under martial law. Thus, the purpose of this article is to explore the specific features, challenges, and solutions of human resource management in the sociocultural sphere during wartime, drawing attention to both theoretical frameworks and real-world practices that can strengthen institutional effectiveness and societal stability.

Description of the problem. The full-scale war unleashed in Ukraine has inflicted unprecedented systemic stress on every aspect of national life,

particularly on the economic structure and labor dynamics. This disruption has not spared any sector-ranging from agriculture and manufacturing to the sociocultural sphere and the hospitality industry. The ripple effects of war have fundamentally destabilized labor supply chains, human resource continuity, and organizational structures, compelling institutions to function in an atmosphere of unpredictability, risk, and emotional overload.

One of the gravest and most immediate challenges is the large-scale loss of workforce due to forced displacement, military mobilization, and emigration. Millions of Ukrainians-many of them working-age adults-have been uprooted from their homes. A significant number of employees from sociocultural and service-related sectors, especially women, youth, and creative professionals, were forced to evacuate from territories under occupation or heavy bombardment. These individuals often belonged to the most active segment of the labor market, possessing soft skills, language fluency, and sector-specific experience that are essential for maintaining service quality and guest experience. According to recent demographic data, over one-third of the population of Ukraine has been internally or externally displaced since the onset of the war. This massive demographic shift has led to a profound contraction in the availability of labor, especially in urban centers and conflict-adjacent regions (Kudelia & Yakovenko, 2023).

Simultaneously, those employees who remain in Ukraine and continue working do so under extreme psychological and emotional stress. Their working lives are overshadowed by constant threats: missile attacks, curfews, blackouts, transportation disruptions, and personal tragedies. Many have lost homes, loved ones, or face the daily anxiety of having relatives on the battlefield. As a result, workplace morale suffers deeply, and conventional management tools such as performance bonuses or productivity-based promotions lose their motivational power. Under such conditions, a narrow focus on metrics or cost-efficiency becomes irrelevant, even counterproductive. Employers must now recognize emotional health, burnout prevention, and psychological resilience as central pillars of any viable HR strategy (Hushtan & Petechel, 2024).

In addition to psychological concerns, the legal framework governing labor has undergone substantial revisions to accommodate wartime exigencies. The adoption of the Law of Ukraine "On the Organization of Labor Relations Under Martial Law" (No. 2136-IX, enacted in March 2022) has introduced significant changes in employment regulation. These include revised provisions for employment contracts, modified grounds for termination, flexible scheduling allowances, and employer authority to alter working conditions without prior employee consent in specific cases (Kudelia & Yakovenko, 2023). While these reforms provide much-needed operational flexibility, they also place increased ethical and administrative responsibility on HR managers. The blurred legal

boundaries demand that HR professionals operate with heightened integrity, ensuring transparency, avoiding abuse of authority, and maintaining the trust of their workforce despite the volatile environment.

To provide a clearer overview of how HR practices are adapting under martial law, the table below presents key problem areas and the corresponding strategic solutions being implemented across Ukraine's sociocultural and hospitality sectors:

Table 1

HR Management Practices under Martial Law

Key Areas of HR Management	Adaptation Measures
Employee Safety	Evacuation plans, shelters, safe workspaces
Psychological Support	Access to counseling, stress resilience training
Motivation Systems	Non-material rewards, recognition programs
Remote and Flexible Work	Remote work formats, flexible schedules
Temporary Staff Integration	Recruitment campaigns, short-term contracts
Use of Senior Workforce Potential	Inclusion in mentoring, flexible roles
Continuous Training	Digital upskilling, rapid onboarding
Risk Management	Business continuity planning, crisis protocols

Source: composed based on (Hushtan & Petechel, 2024); Kudelia & Yakovenko, 2023; Cherep, Kaliuzhna & Mykhailichenko, 2023; Chornodid, Vasylets & Petrenko, 2022; Buhai, 2024; Chernyshova, Bondar & Krasilovska, 2024).

One particularly important trend across recent research is the growing importance of non-material motivation techniques. Financial rewards, while still relevant, have diminished motivational power during wartime due to reduced profitability, supply chain disruptions, and the broader economic crisis. In response, HR managers and business leaders are increasingly deploying recognition-based incentives, peer appreciation systems, and wellness initiatives to maintain staff engagement. These include programs that acknowledge individual contributions publicly, create safe spaces for emotional expression, and foster team bonding. In many cases, such intangible motivators-when aligned with organizational values-are more effective than monetary rewards in sustaining morale and encouraging loyalty under conditions of chronic uncertainty (Hushtan & Petechel, 2024; Chornodid, Vasylets & Petrenko, 2022).

Another critical dimension is risk management**.** HR departments are now central to enterprise resilience planning. Not only must they prepare for human losses or sudden relocations, but they also need to create protocols for continuity of work in case of air raids, blackouts, or communication failure. Israeli enterprises, as a comparative example, have long incorporated such contingency

planning into HR policy. They implement regular drills, distribute emergency kits, and educate employees on situational awareness – lessons now highly relevant for Ukrainian employers (Kudelia & Yakovenko, 2023).

An often overlooked but increasingly essential trend is the integration of senior workforce**.** Due to mass conscription and emigration of younger workers, many organizations have turned to experienced, older employees – often undervalued in pre-war hiring. These individuals bring institutional memory, emotional resilience, and stability, which are invaluable during periods of turbulence. Programs aimed at retaining and retraining older workers are now receiving attention as a sustainable staffing solution (Kovalyk & Levchuk, 2023).

Digitalization of HR functions has accelerated under necessity. Recruitment, onboarding, training, and evaluation are increasingly handled online to bypass physical risks. Yet, this transition also creates gaps – many middle-aged and senior employees lack digital literacy. Employers must therefore balance between innovation and inclusivity, ensuring no one is left behind in the tech shift.

Another underlined problem is conflict management within teams**.** War intensifies psychological strain, which often manifests in workplace tension, mistrust, or burnout. HR managers are now responsible for defusing these risks through emotional intelligence training, role clarification, and regular team-building efforts (Chernyshova, Bondar & Krasilovska, 2024).

Importantly, as highlighted in the works of O. Cherep et al. and K. Buhai, the sociocultural sphere also serves a therapeutic role during wartime – offering cultural continuity, psychological relief, and national identity reinforcement. HR professionals working in theaters, museums, or creative studios are thus managing not just internal teams but are also contributing to social stability through their output (Buhai, 2024).

Lastly, corporate social responsibility has emerged as a crucial HR concern. Many hospitality businesses have engaged in volunteer initiatives, supported territorial defense forces, or provided services to displaced populations. These efforts, while humanitarian, also enhance employee engagement and brand loyalty – creating a sense of collective mission.

Research results and prospects. The ongoing war in Ukraine has presented unprecedented challenges to all sectors of society, including sociocultural institutions and hospitality enterprises. These challenges have provided a real-time testing ground for the transformation of human resource management (HRM) systems. Based on the current research, institutional reports, and professional observations, several key patterns and innovations have emerged that redefine both the theory and practice of HRM in crisis conditions.

One of the most crucial findings is the necessity of adaptive, human-centric HRM strategies that prioritize psychological safety, flexibility, and ethical leadership. Numerous organizations that succeeded in maintaining operations throughout the war have demonstrated that rapid adaptation to external stressors – rather than rigid adherence to pre-war protocols – is essential for institutional survival. For example, successful institutions have restructured workflows, introduced flexible schedules, and developed internal crisis response teams, all while focusing on the emotional wellbeing of staff. These practices have proven to be more than temporary solutions; they now represent a new operational paradigm.

Sector-specific practices further highlight the breadth of HRM transformation. In cultural institutions such as museums and libraries, HR departments redefined work roles to include digital content creation, online education, and community outreach programs. These new responsibilities not only helped institutions remain active but also empowered staff with new skills. Similarly, in the hospitality sector, businesses that diversified services – for instance, converting hotels into shelters or community kitchens – also adapted their HR policies. Staff were retrained to interact with vulnerable populations, implement health protocols, and provide psychological first aid, making their roles more socially impactful.

An important outcome of the wartime HR shift is the reevaluation of leadership models. Traditional top-down approaches have increasingly been replaced with distributed and empathetic leadership. This shift acknowledges that staff in crisis zones require leaders who are emotionally intelligent, capable of making decisions under uncertainty, and sensitive to the personal circumstances of team members. As a result, training programs now include modules on trauma-informed leadership, rapid response coordination, and collaborative decision-making.

Organizational resilience has also become a key area of focus. The most successful HR departments operate not merely as administrative units but as strategic partners in institutional survival. They are involved in scenario planning, logistics coordination, and community engagement. This expanded role of HR professionals allows organizations to foresee disruptions, identify essential personnel, and build redundancy into staffing plans. For instance, several institutions have created reserve pools of cross-trained staff ready to take over key functions if frontline employees become unavailable.

Training and upskilling have become central pillars of HRM during the war. Institutions have invested in rapid training programs covering digital tools, psychological resilience, and safety protocols. In addition to technical skills, soft skills such as communication, empathy, and problem-solving have been emphasized. These programs are often conducted online, using gamification

elements or peer mentoring models to maintain engagement. HR professionals note that such training not only improves job performance but also instills a sense of purpose and belonging among staff.

Prospects for future development suggest that many of the crisis-induced changes in HRM will be institutionalized even after the war ends. For example, hybrid work models, psychological safety frameworks, and decentralized decision-making are likely to remain cornerstones of post-war HRM. The success of these approaches during wartime has challenged long-standing assumptions about workplace efficiency and authority structures. Furthermore, the war has exposed gaps in traditional HR education and policy-making, indicating the need for new academic programs, certification standards, and legislative reforms that better align with emergency realities.

International experience offers additional insights. Studies of Israeli enterprises, for instance, underscore the importance of embedding security and flexibility into HR policy from the outset. Regular emergency drills, psychological preparedness training, and modular job descriptions enable rapid response to unforeseen events. Ukrainian institutions are increasingly looking to such models to inform their own HR development strategies.

Another emerging trend is the focus on inclusion and diversity. Wartime displacement has led to more heterogeneous workplaces, with staff from various regions, age groups, and backgrounds working together. This diversity, while initially challenging in terms of communication and coordination, has become an asset when managed properly. HR departments that provide intercultural communication training and promote inclusive team cultures report stronger collaboration and innovative problem-solving.

Technological integration remains a high-priority prospect. As institutions invest in AI-based tools for recruitment, performance tracking, and mental health diagnostics, HRM is becoming increasingly data-driven. However, experts caution against over-reliance on algorithms without human oversight. A balanced approach that leverages technology while preserving the relational core of HRM is essential, particularly in sensitive sectors like culture and hospitality.

Finally, collaborative networks among institutions have proven to be valuable for sharing resources, training opportunities, and best practices. National associations and regional HR alliances have emerged, creating platforms for knowledge exchange and coordinated responses. These networks are expected to play a greater role in the reconstruction phase, supporting standardization, advocacy, and innovation in HR policy across the sociocultural landscape.

In conclusion, research results from the wartime context in Ukraine reveal a profound reconfiguration of human resource management. Far from being merely reactive, the new HRM paradigm is proactive, values-driven, and

strategically aligned with institutional and national resilience. As the country moves toward recovery, the lessons learned during this period offer a foundation for building a more inclusive, sustainable, and adaptable HR infrastructure capable of withstanding future crises.

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HOW TO CITE THIS ARTICLE
Tonkykh, O., Antonenko, A., Vozniuk, D. (2026). Features of human resource management in the sociocultural sphere under martial law. *Management*, 1(43): 9–18. https://doi.org/10.30857/2415-3206.2026.1.1.

JEL Classification: G32

UDC 338.246.025. 88.033.12

DOI: 10.30857/2415-3206.2026.1.2

REPUTATION RISK MANAGEMENT OF A RESTAURANT ENTERPRISE

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PRESENTATION. In the modern competitive environment of the restaurant business, the reputation of an enterprise has become one of its most critical and vulnerable assets. The success or failure of a restaurant can depend not only on the quality of its products and services but also on the opinions of customers formed through public channels such as social networks, review platforms, and media coverage. Reputational risk today acts as a decisive factor influencing consumer loyalty, profitability, and long-term development. One negative review, unresolved complaint, or scandal may significantly affect the brand's image, leading to financial losses and the loss of customer trust.

THE PURPOSE OF ARTICLE is to explore the nature and specific characteristics of reputational risks in the restaurant business, identify their main sources, and propose structured approaches to manage and mitigate them. In the context of digitalization and increased consumer awareness, restaurant enterprises must develop and implement proactive strategies to protect and enhance their reputation. The relevance of this topic is confirmed by the growing number of crisis situations in the hospitality industry caused by reputational failures, which in turn proves the need for scientific research and practical recommendations on reputation risk management. This study aims to form a comprehensive understanding of the mechanisms of reputational risk development, analyze existing prevention and response tools, and systematize approaches that can be implemented at the operational and strategic levels of restaurant enterprise management. Additionally, the study seeks to highlight the importance of combining traditional methods of customer service quality control with modern digital tools that enable real-time reputation monitoring and customer sentiment analysis.

RESEARCH METHODS. The research is based on general scientific and applied methods, including analysis, synthesis, classification, comparison, systemic and situational approaches, SWOT analysis, modeling of reputational risk scenarios, expert evaluation, and content analysis of online reviews. The use of these methods made it possible to form a balanced view of the phenomenon of reputational risk and develop scientifically grounded conclusions and recommendations for restaurant businesses.

CONCLUSIONS. The study demonstrates that in the modern digital landscape, reputation has become a decisive factor for the financial stability and long-term competitiveness of restaurant enterprises. Effective management of reputational risks requires a proactive approach that integrates traditional quality control with advanced digital tools for real-time sentiment monitoring and crisis communication. Ultimately, systematizing these risk mitigation strategies at both operational and strategic levels is essential for maintaining consumer loyalty and building a resilient brand image in a highly volatile market.

Keywords: reputation; restaurant business; risk management; online reviews; customer loyalty; crisis communication; digital monitoring; brand image.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
10	0	1

Received: 12.11.2025	Revised: 26.12.2025	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: G32

УДК 338.246.025.88.033.12

DOI: 10.30857/2415-3206.2026.1.2

УПРАВЛІННЯ РЕПУТАЦІЙНИМИ РИЗИКАМИ ПІДПРИЄМСТВА РЕСТОРАННОГО БІЗНЕСУ

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ВИСТУП. В умовах сучасної конкуренції та цифрової відкритості ресторанного бізнесу, репутація підприємства стала одним із ключових нематеріальних активів, від якого безпосередньо залежить його успішність і життєздатність. Наявність навіть одного конфліктного випадку з клієнтом, негативного відгуку в Інтернеті чи кризової ситуації, що набирає вірусного поширення, може мати критичні наслідки для бренду. Сформовані через цифрові платформи уявлення споживачів про заклад сьогодні відіграють не менш важливу роль, ніж якість страв чи рівень обслуговування.

МЕТОЮ СТАТТІ є дослідження природи репутаційних ризиків у ресторанній сфері, виявлення основних факторів їх виникнення та формування ефективних підходів до управління ними. У контексті цифровізації, соціальних мереж та зростаючих очікувань клієнтів підприємства ресторанного бізнесу повинні впроваджувати проактивні стратегії, які дозволять не лише оперативно реагувати на загрози, але й системно зміцнювати свій репутаційний капітал.

Актуальність дослідження зумовлена зростанням кількості кризових ситуацій, пов'язаних із репутаційними втратами, які ускладнюють ведення бізнесу та знижують конкурентоспроможність закладів. Саме тому виникає потреба в розробці системного підходу до управління репутаційними ризиками, який охоплює як внутрішню комунікацію, стандарти взаємодії з клієнтами, так і цифрові інструменти моніторингу публічного простору. У статті розглядаються шляхи інтеграції репутаційного менеджменту в загальну систему стратегічного управління підприємством. Такі підходи дають змогу забезпечити не лише вчасну реакцію на потенційні загрози, а й формування позитивного іміджу підприємства серед наявних і потенційних клієнтів.

МЕТОДИ ДОСЛІДЖЕННЯ. У процесі написання статті застосовувалися загальнонаукові та прикладні методи: аналіз, синтез, класифікація, порівняння, системний і ситуаційний підходи, SWOT-аналіз, моделювання сценаріїв розвитку репутаційних ризиків, експертна оцінка та контент-аналіз онлайн-відгуків. Сукупність використаних методів дозволила сформувати об'єктивну картину природи репутаційних ризиків і розробити практичні рекомендації для закладів ресторанного бізнесу.

ВИСНОВКИ. Дослідження демонструє, що в сучасному цифровому середовищі репутація стала вирішальним фактором фінансової стабільності та довгострокової конкурентоспроможності ресторанних підприємств. Ефективне управління репутаційними ризиками вимагає проактивного підходу, який інтегрує традиційний контроль якості з передовими цифровими інструментами для моніторингу настроїв у режимі реального часу та кризової комунікації. Зрештою, систематизація цих стратегій зменшення ризиків як на операційному, так і на стратегічному рівнях є важливою для підтримки лояльності споживачів та формування стійкого іміджу бренду на дуже волатильному ринку.

КЛЮЧОВІ СЛОВА: репутація; ресторанний бізнес; управління ризиками; онлайн-відгуки; лояльність клієнтів; кризова комунікація; цифровий моніторинг; імідж бренду.

Introduction. In today's hyperconnected and consumer-driven environment, the restaurant industry faces an unprecedented set of challenges related to public perception, customer expectations, and digital transparency. Unlike in the past, when reputation was shaped slowly through word-of-mouth and personal experience, today's perception of a brand can be formed-or destroyed-within minutes on digital platforms. Reputation has become a vital intangible asset that can determine the long-term sustainability or decline of a restaurant enterprise. While traditional risks such as financial instability, supply chain disruptions, or operational inefficiencies remain important, reputational risk has emerged as one of the most volatile, cross-cutting, and difficult-to-control types of threats. It is shaped by both internal factors-such as service quality, employee behavior, food safety, and hygiene standards-and external factors, including media coverage, social media activity, online reviews, and public sentiment.

The rapid digital transformation of the hospitality sector has significantly amplified the influence of reputation-related variables. Platforms such as Google Reviews, TripAdvisor, Yelp, Instagram, TikTok, and Facebook serve as real-time barometers of public opinion. A single negative customer experience-especially one recorded, shared, and commented upon online-can reach thousands of potential customers within hours, drastically altering public perception and triggering a cascade of reputational consequences. In this volatile ecosystem, customers are not only consumers of services but also active producers of content that shapes brand image. Simultaneously, the growing importance of customer experience, brand loyalty, transparency, and ethical business practices has placed additional pressure on restaurant enterprises to monitor, manage, and protect their public image continuously and consistently.

In this context, managing reputational risk is no longer optional; it is a core component of strategic risk governance. Effective reputation management demands a structured and proactive approach that integrates internal corporate policies, digital monitoring tools, public relations protocols, and cross-functional coordination. It involves not only reacting swiftly and credibly to negative events but also building a resilient brand image that can absorb shocks and maintain stakeholder confidence. Key components of such a strategy include training staff on communication and service delivery standards, embedding corporate values into everyday operations, actively engaging with customer feedback (both online and offline), monitoring sentiment in real time, and developing clear, pre-approved crisis response protocols.

Furthermore, the emergence of technologies such as artificial intelligence (AI), natural language processing (NLP), and machine learning has enabled more precise and automated monitoring of reputational signals. Enterprises can now detect sentiment shifts, analyze review trends, and predict potential crises

before they escalate. These capabilities not only enhance operational readiness but also support long-term brand building and customer loyalty.

Understanding the mechanisms behind reputational risk in the restaurant industry is essential for developing sustainable and competitive enterprises. As reputation becomes an increasingly measurable, dynamic, and manageable factor-thanks to technological advances and evolving consumer behavior-those businesses that treat it as a core element of their operational and strategic DNA are far more likely to thrive. In an industry where trust, perception, and experience drive success, the ability to manage reputation effectively may become the single most defining factor of long-term performance.

Description of the problem. In the 21st century, where information technologies, consumer awareness, and digital communication are evolving at unprecedented rates, the restaurant business finds itself exposed to an entirely new and complex dimension of risks-reputational risks. Unlike traditional operational or financial risks, which may be localized and quantifiable, reputational risks are often intangible, unpredictable, and capable of causing irreversible damage within hours. They do not necessarily stem from actual operational failure, but from public perception, which can be influenced by misinformation, emotional reactions, or viral social media dynamics. This challenge is especially acute in the restaurant sector, where business success directly depends on public perception, customer experience, and continuous interaction with a variety of stakeholder groups (Ambroise & PrimAllaz, 2017).

The restaurant industry in Ukraine, which is experiencing recovery and transformation amidst post-crisis conditions and a rapidly changing socio-economic context, faces mounting challenges in managing its intangible assets, particularly reputation. In a context of heightened consumer scrutiny and rapidly spreading digital narratives, reputational issues can escalate beyond local impact and generate long-lasting effects. Given the sensitivity of restaurant clients to factors such as hygiene, service quality, employee behavior, and digital feedback, even a single negative review or service failure can ripple across various media platforms, causing cascading reputational damage that may be difficult to control (Gatzert & Schmit, 2015).

One of the key issues facing restaurant enterprises is the lack of systemic understanding and institutionalization of reputation risk management. Many businesses continue to treat reputational crises as isolated, reactionary events rather than manifestations of deeper structural weaknesses in brand governance, communication policy, and operational quality (Kukina, Ohloblyna & Tkachenko, 2024). This fragmented view often results in delayed or inappropriate responses to reputational threats, further amplifying the damage.

Digitalization has further intensified the vulnerability of restaurants to online reputation threats. Platforms such as TripAdvisor, Google Reviews,

Facebook, Instagram, and TikTok have become pivotal in shaping public perception and influencing consumer behavior. Research by Seheda emphasizes that digital feedback is not only widespread but also has a multiplier effect: a single negative post, when amplified by comments, shares, and influencer engagement, may reach thousands of potential clients and cause long-term damage to customer trust and brand value (Seheda, 2023).

To better understand the complex landscape of reputational vulnerabilities, it is essential to examine the key internal and external sources of risk that threaten restaurant enterprises. These sources differ in their origin, controllability, and impact but are equally significant in shaping the overall risk profile of a brand. The following table outlines the major categories of reputational risk in the restaurant industry, categorized by their source and type. This classification serves as a foundational tool for identifying weak points in organizational systems and designing appropriate preventive or corrective actions.

Table 1

Key Internal and External Sources of Reputational Risk in the Restaurant Industry

Source of Risk	Description	Type	Source of Risk
Inconsistent service quality	Uneven customer experience caused by staff turnover, poor training, or unclear standards	Internal	Inconsistent service quality
Hygiene or food safety incidents	Violations in sanitary conditions, contamination, or poor storage practices	Internal	Hygiene or food safety incidents
Lack of transparency	Unclear pricing, misleading advertising, or hidden ingredients	Internal	Lack of transparency
Employee misconduct	Rude behavior, discrimination, or illegal actions by staff	Internal	Employee misconduct
Crisis mismanagement	Poor handling of public complaints, scandals, or emergencies	Internal	Crisis mismanagement
Negative online reviews	Poor ratings and viral criticism on Google, TripAdvisor, Instagram, etc.	External	Negative online reviews
Unsubstantiated media accusations	Publications or influencer comments based on rumors or bias	External	Unsubstantiated media accusations
Competitor manipulation	Spread of false information, sabotage through fake reviews	External	Competitor manipulation
Societal and political instability	External factors affecting perception of safety, availability, or ethical positioning		Societal and political instability

Source: developed by the authors based on (Sherifi, Kapitanets & Kalra, 2023; Ambroise & PrimAllaz, 2017; Seheda, 2023].

These risks, as presented in Table 1, vividly illustrate the breadth, depth, and complexity of the reputational landscape in the modern restaurant industry. Each listed factor represents a potential vulnerability point that, if unaddressed, can severely undermine a restaurant's credibility, financial health, and long-term competitiveness. Internal risks-such as inconsistent service, hygiene violations, or employee misconduct-are theoretically more controllable, as they fall within the operational boundaries of the enterprise. However, these risks often go unmonitored or are underestimated until they escalate into full-blown crises. This typically occurs due to poor internal reporting mechanisms, insufficient staff training, or the absence of real-time quality control systems.

On the other hand, external reputational risks-though harder to predict or influence-can be even more destructive due to their amplification through digital channels and media exposure. These include viral negative reviews, fake online attacks from competitors, or politically charged incidents affecting public trust. Managing such risks demands more than reactive responses; it requires pre-established public relations protocols, strategic community engagement efforts, and advanced digital monitoring infrastructure capable of detecting early signals of reputational threats (Sherifi, Kapitanets & Kalra, 2023).

Despite the acknowledged strategic importance of reputation, there remains a notable governance gap in how Ukrainian restaurant enterprises integrate this intangible asset into their overall risk management structures. In practice, many businesses continue to regard reputation as a passive outcome of their marketing efforts, rather than a dynamic process that requires dedicated resources, tools, and cross-departmental coordination. Research by Kukina et al. reveals that only a small proportion of Ukrainian service enterprises include reputation-related key performance indicators (KPIs) in their risk management dashboards. This disconnection signals a broader issue: a misalignment between the recognized significance of reputation and the actual operational commitment to safeguarding it (Kukina, Ohloblyna & Tkachenko, 2024).

Importantly, reputation in the restaurant business is no longer owned solely by the company-it is co-created in real time by a wide array of stakeholders, including employees, customers, suppliers, regulators, and the broader digital community. Sherifi et al. emphasize that stakeholder perceptions of trustworthiness, ethical conduct, and corporate responsibility directly shape an enterprise’s ability to survive during economic and reputational shocks (Sherifi, Kapitanets & Kalra, 2023).

The modern era of radical transparency has collapsed the boundaries between internal culture and external image. Workplace grievances, employee mistreatment, or toxic management practices can now become instantly visible to the public through platforms like Twitter, Glassdoor, or YouTube. Consequently, reputation is no longer insulated from HR practices or internal

communication protocols. Even when service delivery remains technically sound, reputational damage can occur from behind-the-scenes issues that resonate with wider societal concerns, such as labor rights, diversity, or sustainability (Makarchuk, 2020).

This new context makes it essential to integrate stakeholder mapping and engagement strategies into all stages of reputational risk assessment. By identifying the expectations and influence levels of various stakeholder groups, enterprises can prioritize risk mitigation efforts and tailor communication strategies accordingly. This process involves not only mapping interaction points but also conducting regular sentiment analysis and feedback loops to adjust policies and practices in a timely and informed manner (Gatzert & Schmit, 2016).

In conclusion, the core of the problem lies not only in the growing presence of reputational threats but in the lack of coherent, proactive, and technologically integrated systems to manage them. The restaurant industry must move beyond treating reputation as an abstract concept and begin viewing it as a measurable, strategic, and operational imperative. This requires a paradigm shift toward structured governance, digital transformation, organizational alignment, and continuous stakeholder engagement. Only by embedding these elements into the DNA of the enterprise can restaurants navigate the turbulent waters of today's reputational risk environment and build long-term brand resilience.

Research results and prospects. The analysis of reputation risk management in the restaurant industry reveals a critical need for systematic, integrated, and forward-looking approaches. The research findings emphasize that reputation, once perceived as a passive byproduct of brand performance, has now evolved into a strategic asset that requires continuous monitoring, active defense, and long-term investment. Within the dynamic and highly competitive landscape of the hospitality sector, restaurant enterprises are particularly vulnerable to reputational damage due to the immediacy of customer interaction, the visibility of digital platforms, and the intangibility of service delivery.

One of the key results of the research is the identification of the multidimensional character of reputational risks. These risks stem from both internal and external sources, such as poor service quality, hygiene failures, employee misconduct, crisis mismanagement, negative online reviews, media bias, and broader societal instability. Despite this complexity, most restaurant enterprises in Ukraine and beyond still lack robust frameworks for identifying, classifying, and mitigating these threats in a structured and anticipatory manner (Seheda, 2023).

It has also been observed that reputation risk management is frequently treated as a reactive function, triggered only after a crisis has occurred. This approach not only undermines the ability of restaurant enterprises to maintain

stakeholder trust but also increases the cost, complexity, and duration of crisis recovery. The research highlights the importance of transitioning from reactive to proactive reputation governance, where risk anticipation, digital presence monitoring, and strategic planning form the core of brand and trust management.

A significant insight derived from this study is the insufficient integration of reputation management across operational silos. Marketing, customer service, operations, human resources, and digital communication departments often function independently, resulting in fragmented and delayed responses to reputational threats. This siloed approach weakens organizational agility and increases exposure to reputational volatility. Therefore, reputation governance must be embedded into cross-functional workflows and supported by executive-level ownership and accountability structures.

Research shows that technological innovation plays a vital role in strengthening reputation risk oversight. Many restaurant enterprises have begun adopting Customer Relationship Management (CRM) systems with integrated feedback tracking, sentiment analysis, and real-time alert mechanisms. These systems allow for the early detection of dissatisfaction signals and enable preventive interventions. Additionally, advanced tools such as natural language processing (NLP), machine learning algorithms, and predictive analytics can now process vast volumes of user-generated content, offering early-warning insights into emerging risks, online trends, or customer dissatisfaction hotspots.

The research also confirms that customer trust and stakeholder perception are increasingly shaped by ethical, social, and environmental considerations. Consumers are more likely to support restaurant enterprises that demonstrate authenticity, transparency, and social responsibility. Thus, businesses must align their reputation management strategies with broader ESG (Environmental, Social, and Governance) principles. This includes implementing inclusive labor practices, engaging in community initiatives, adopting sustainable operations, and transparently communicating values to the public in both local and global markets.

The research further suggests the integration of stakeholder mapping into reputation management strategies. By identifying key stakeholders—customers, employees, suppliers, regulators, media, and local communities—and assessing their influence on brand reputation, enterprises can design tailored communication and engagement strategies to reinforce trust. This stakeholder-centric model enhances the relevance, effectiveness, and sustainability of reputation governance practices, especially in times of reputational volatility or socio-political disruption (Seheda, 2023).

In conclusion, reputation is no longer an intangible and unmanageable asset. It is a measurable, dynamic, and critical element of business sustainability in the restaurant industry. The research demonstrates that enterprises that

proactively invest in reputation risk management – through technology, employee development, stakeholder engagement, and strategic alignment – are more resilient, trusted, and successful in the long term. Given the increasing transparency and volatility of today's market, managing reputation is not optional; it is imperative for survival, adaptability, and sustainable growth in the restaurant sector.

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HOW TO CITE THIS ARTICLE
Tonkykh, O., Antonenko, A., Kotiash, Y. (2026). Reputation risk management of a restaurant enterprise. *Management*, 1(43): 19–28. https://doi.org/10.30857/2415-3206.2026.1.2.

JEL Classification: M31, L14, L67

UDC 658.89:005.7

DOI: 10.30857/2415-3206.2026.1.3

MECHANISM OF CASCADING VALUE TRANSMISSION IN THE TEXTILE AND APPAREL INDUSTRY

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PROBLEM STATEMENT. Customer experience management (Lemon & Verhoef, 2016) has developed predominantly in the business-to-consumer segment; its extension to business-to-business (De Keyser et al., 2025; Wirtz et al., 2025) remains constrained to dyadic supplier–customer relationships. The textile and apparel production chain encompasses three functional levels, at each of which a distinct customer experience is formed, with the downstream experience partially conditioned by the value received in the upstream tiers.

PURPOSE. To substantiate the mechanism of cascading value transmission in customer experience formation within the textile and apparel production chain and to define the role of absorptive capacity as moderator of value transfer between levels.

MAIN HYPOTHESIS. Customer experience in the textile and apparel production chain is formed cascadingly: value received by a participant of exchange at one level is transformed into an operant resource and transmitted to the next level, with the effectiveness of each transition moderated by the recipient's absorptive capacity.

METHODS. Abstraction, comparison, classification, systems approach.

RESULTS. A mechanism of cascading value transmission is proposed: value-in-use received by a participant at one level is transformed into an operant resource and integrated into the participant's value proposition for the next level, with effectiveness determined by the recipient's absorptive capacity. The mechanism is projected onto the three-level architecture: equipment supplier – factory – brand and end consumer.

CONCLUSIONS. The mechanism links three concepts: service-dominant logic, absorptive capacity theory, and the typology of business-to-business value propositions. Investments by upstream suppliers in midstream customer experience generate an effect that extends beyond dyadic relationships and influences end-consumer experience, provided sufficient absorptive capacity at each level.

KEYWORDS: absorptive capacity; cascading value transmission; customer experience; service-dominant logic; textile and apparel industry.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
13	2	1

Received: 02.04.2026	Revised: 08.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification:
M31, L14, L67

УДК 658.89:005.7

DOI: 10.30857/2415-3206.2026.1.3

МЕХАНІЗМ КАСКАДНОЇ ПЕРЕДАЧІ ЦІННОСТІ У ЛЕГКІЙ ПРОМИСЛОВОСТІ

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ПОСТАНОВКА ПРОБЛЕМИ. Управління клієнтським досвідом (Lemon & Verhoef, 2016) розвивалося переважно у сегменті відносин «підприємство – кінцевий споживач»; перехід концепції у сегмент відносин «підприємство – підприємство» (De Keyser et al., 2025; Wirtz et al., 2025) обмежується двосторонніми відносинами «постачальник – клієнт-підприємство». Виробничий ланцюг легкої промисловості охоплює три функціональні рівні – верхній (постачальницький), середній (виробничий) і нижній (споживчий), на кожному з яких формується власний клієнтський досвід, причому досвід нижнього рівня частково зумовлюється цінністю, отриманою учасниками верхніх рівнів.

МЕТА. Обґрунтувати механізм каскадної передачі цінності у формуванні клієнтського досвіду в умовах виробничого ланцюга легкої промисловості, визначити роль абсорбційної здатності як модератора переходу цінності між рівнями.

ОСНОВНА ГІПОТЕЗА. Клієнтський досвід у виробничому ланцюзі легкої промисловості формується каскадно: цінність, отримана учасником обміну на одному рівні, перетворюється на оперантний ресурс і передається наступному рівню, причому ефективність кожного переходу модерується абсорбційною здатністю учасника-реципієнта.

МЕТОДИ. Абстрагування, порівняння, класифікація, системний підхід.

РЕЗУЛЬТАТИ. Запропоновано механізм каскадної передачі цінності, за яким цінність-у-використанні, отримана учасником на одному рівні виробничого ланцюга, перетворюється на оперантний ресурс і інтегрується у його ціннісну пропозицію для наступного рівня. Ефективність переходу визначається абсорбційною здатністю учасника-реципієнта. Механізм спроєктовано на трирівневу архітектуру виробничого ланцюга легкої промисловості: постачальник обладнання – фабрика – бренд та кінцевий споживач.

ВИСНОВКИ. Запропонований механізм пов'язує три теоретичні концепції: сервісно-домінантну логіку, теорію абсорбційної здатності та типологію ціннісних пропозицій у відносинах між підприємствами. Інвестиції постачальника верхнього рівня у досвід клієнтів середнього рівня генерують ефект, що виходить за межі двосторонніх відносин і впливає на досвід кінцевого споживача за умови достатньої абсорбційної здатності на кожному рівні ланцюга.

КЛЮЧОВІ СЛОВА: абсорбційна здатність; клієнтський досвід; легка промисловість; передача цінності; сервісно-домінантна логіка.

Introduction. Customer experience as an object of academic enquiry has evolved from a descriptive notion, used to capture consumer sensations at points of contact, into a strategic resource shaping the competitive position of an enterprise (Lemon & Verhoef, 2016). The accumulated body of knowledge primarily concerns the business-to-consumer segment, in which the beneficiary of interaction is the individual consumer and the supplying enterprise designs the system of conditions for the emergence of consumer experience.

The extension of the subject field to the business-to-business segment has occurred during the last five years in the works of J. Wirtz et al. (2025) and A. De Keyser et al. (2025), which identified the specificity of corporate buyers, systematised the types of value propositions and archetypes of customer experience management strategies, and proposed a multilevel analysis of the corporate customer. Both works share a structural limitation: they analyse the dyadic supplier–customer relationship without addressing the cascade between successive levels of the production chain.

G. Rejikumar and A. Asokan-Ajitha (2023) extended the subject of analysis beyond dyadic interaction and statistically confirmed the correlation between the quality of the corporate customer experience and the experience of the end consumer. The generating mechanism, however, remained outside the scope of that work.

The Industry 5.0 framework (Breque et al., 2021) reshapes the conditions of research on this question through the recognition of three structural pillars: human-centricity, sustainability, and resilience. According to this framework, the participant in the production process ceases to be an object of data collection and becomes a subject whose development and experience constitute the purpose of the system. Customer experience management under such conditions becomes a structural requirement of competition, with this requirement extending not only to the point of contact with the end consumer but to all levels of the production chain.

Within the textile and apparel production chain, three functional tiers can be distinguished. The upstream (supplier) tier is formed by suppliers of equipment and materials, which provide the technological and raw-material base. The midstream (production) tier is represented by factories, technologists, mechanics, and operational personnel, who transform equipment and materials into finished products. The downstream (consumer) tier comprises brands, retail, and end consumers, with the brand potentially possessing its own production capacities or operating on an outsourcing basis with independent factories. At each tier a distinct customer experience is formed; experience at the downstream tier depends partially on what participants in the upstream tiers have received.

Service-dominant logic (Vargo & Lusch, 2016) has proposed a theoretical system that recognises the multiplicity of participants of exchange and the

subjective nature of value. Three foundational axioms make this extension possible. FP6 states that value is co-created by multiple participants of exchange. FP9 establishes that all socio-economic actors are resource integrators. FP10 holds that value is determined by the beneficiary phenomenologically, through their subjective experience within their own context of use. Together, these axioms open the possibility of extending the category of customer experience to all participants of the production chain.

The factory technologist who interacts with the equipment supplier is a customer in the same sense in which the end consumer is a customer of the brand. Service-dominant logic frames value creation as a non-hierarchical network interaction among participants. J.D. Chandler and S.L. Vargo (2011) identified three levels on which this interaction takes place simultaneously: the level of individual interaction, the level of the organisation, and the level of the institutional environment. This differentiation underpins the concept of the service ecosystem. In these approaches the transition between levels is described through institutional norms, that is, through a change in the rules of the game, rather than through direct transmission of resources from one participant to the next. The proposed mechanism of cascading value transmission fills precisely this gap by establishing a sequential logic of resource transmission from level to level.

The article pursues two tasks. First, it substantiates the mechanism of cascading value transmission, explaining how value received by a participant of exchange at one level of the textile and apparel production chain becomes a resource that shapes customer experience at the next level. Second, it defines the role of the recipient's absorptive capacity as the moderator of this transition.

Materials and Methods. The study was conducted using abstraction, comparison, classification, and the systems approach. Abstraction was used to single out the category of value transmission from the broader notion of value co-creation in service-dominant logic. Comparison was applied to juxtapose the existing theoretical concepts that partially encompass the components of the mechanism under investigation. Classification was used to typologise the levels of the production chain and the types of value propositions. The systems approach treated the production chain as an integral structure with defined elements, links, and conditions of transition between states.

Results and Discussion. Service-dominant logic is the working instrument of the study. Developed in the works of S.L. Vargo and R.F. Lusch (2016), it is grounded in eleven foundational axioms. The first axiom defines service as the fundamental basis of exchange, with the second adding that indirect exchange masks this fundamental basis. The third axiom treats goods as mechanisms for service provision, and the fourth recognises operant resources as the source of strategic advantage. The fifth axiom defines all economies as service economies

by nature. The sixth axiom proclaims that value is co-created by multiple participants of exchange, including the beneficiary, while the seventh establishes that an enterprise cannot create value unilaterally but only offer value propositions. Customer-orientation of the service-centred approach is recognised as essential by the eighth axiom. The ninth axiom extends the status of resource integrator to all socio-economic actors. According to the tenth, value is determined by the beneficiary phenomenologically, within their own context of use. The eleventh axiom establishes value co-creation through institutions and institutional arrangements.

Three of these axioms form the theoretical foundation of the cascading value transmission mechanism. The sixth axiom substantiates the multiplicity of participants of exchange. Through the ninth, the status of resource integrator extends to all participants, granting the factory technologist and the equipment operator the same standing as the end consumer. The tenth establishes the subjective nature of value, which precludes its mechanical transfer between participants.

The category of absorptive capacity, introduced by W.M. Cohen and D.A. Levinthal (1990) as the capability of an enterprise to recognise, assimilate, and apply new external knowledge, was reconceptualised by S.A. Zahra and G. George (2002) as a dynamic capability with two components: potential and realised. Empirical studies of the moderating role of absorptive capacity predominantly focus on dyadic supplier–customer relationships without extension to cascading transmission between levels of the production chain.

To position the proposed mechanism against existing approaches, five constitutive elements of cascading value transmission are introduced as criteria of comparison. The first element is the transformation of value-in-use received at one level into an operant resource that crosses the inter-organisational boundary to the next level. The second element is cascading logic that connects three or more tiers of a vertical chain. The third element is absorptive capacity acting as the moderator of value transmission between tiers. The fourth element is the explicit treatment of the inter-organisational boundary within a vertical chain rather than a horizontal network. The fifth element is the formalisation of the mechanism through explicit notation of states and the temporal parameter of transmission. Five works that develop separate components of this construction are evaluated against the five elements. Coverage is recorded on a three-point scale: 0 indicates that the element is not addressed, 0.5 indicates partial coverage, 1 indicates full coverage. The results are summarised in Table 1.

The matrix shows that no single approach addresses all five elements of cascading value transmission. M. Wilhelm and V.H. Villena (2021) covers cascading logic and the inter-organisational boundary but applies these to normative transmission of sustainability requirements rather than to value-in-

use. A.K. Paswan et al. (2014) partially addresses four elements, although within a horizontal franchising network rather than a vertical chain. C. Grönroos & P. Voima (2013), G. Rejikumar and A. Asokan-Ajitha (2023), and M. Kleinaltenkamp et al. (2017) each address only the inter-organisational boundary in part. None of the five works formalises the mechanism through explicit notation of states and a temporal parameter. By integrating these dispersed components, the proposed cascading value transmission mechanism forms a unified structure and introduces formalisation, applied to the sectoral architecture of the textile and apparel production chain.

Table 1

Matrix of coverage of cascading value transmission mechanism elements by competing models

Mechanism element	Grönroos & Voima (2013)	Wilhelm & Villena (2021)	Paswan et al. (2014)	Rejikumar & Asokan-Ajitha (2023)	Kleinaltenkamp et al. (2017)
1. Value-in-use → operant resource across boundary	0	0	0.5	0	0.5
2. Cascading logic across multiple tiers	0	1	0.5	0	0
3. Absorptive capacity as moderator of value transmission	0	0.5	0.5	0	0
4. Inter-organisational boundary (vertical chain)	0.5	1	0.5	0.5	0.5
5. Formalisation (notation, time parameter)	0	0	0	0	0

Source: compiled by the author.
Scale: 0 – not addressed; 0.5 – partially addressed; 1 – fully addressed.

The mechanism is built in four moves. The first move extends the notion of 'customer' to all participants of the production chain. The state of the system at each level encompasses the value proposition of the participant for the next level and the operant resource formed as a result of the assimilation of the preceding value. The sixth and ninth axioms of service-dominant logic extend the status of customer to the factory technologist and the equipment operator, who, in interaction with the upstream supplier, act as beneficiaries of exchange and resource integrators.

The second move introduces an essential transformation. Value-in-use does not vanish at the point of receipt but is transformed into an operant resource (Grönroos & Voima, 2013). The new competences of the technologist acquired while working with the equipment of the upstream supplier become a productive resource that is incorporated into the production process of the factory. This transformation constitutes the basis of the proposed mechanism.

The third move establishes the cascading architecture. The operant resource formed at one level is integrated by the participant into the value proposition for the next level: upper → middle → lower. The value transmitted at each transition is not identical to the preceding one: it is transformed and integrated with the participant's own resources.

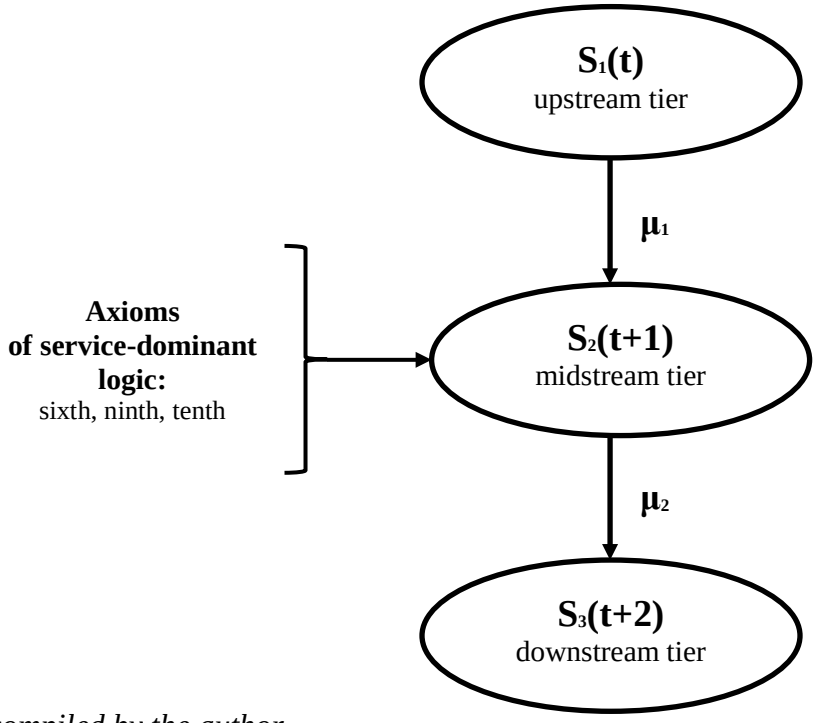
Finally, a moderator governs each transition. The transformation of value into an operant resource does not occur automatically; its effectiveness is determined by the absorptive capacity of the recipient participant (Cohen & Levinthal, 1990; Zahra & George, 2002). A participant with low absorptive capacity does not assimilate the received value, and the transmission ceases at that point. A participant with high absorptive capacity integrates the received value into their own resources and forms an enhanced value proposition for the next level.

For the description of the mechanism in verbal form, the following notation is introduced. The states of the system at three successive levels of the production chain are denoted as $S_1(t)$ (upstream – equipment supplier), $S_2(t+1)$ (midstream – factory, technologist), and $S_3(t+2)$ (downstream – brand, end consumer). The transmission of value from level to level is moderated by the absorptive capacity of the recipient participant, denoted μ. The moderator may act either towards enhancing the transmission, when the recipient participant fully assimilates and transforms the received value, or towards weakening or complete blockage, when the absorptive capacity is insufficient.

The temporal parameter reflects an important property of the mechanism: value transmission in the production chain is not instantaneous. Between the moment of value provision by the upstream supplier and the moment of integration of this value by the participant at the next level, an interval elapses during which processes of assimilation and transformation take place. A single participant with low absorptive capacity interrupts the transmission for the entire subsequent chain. A graphical representation of the mechanism is presented in Figure 1.

The adaptation of the mechanism to the textile and apparel production chain encompasses three successive levels. At the upstream tier, the equipment supplier designs the system of conditions for the emergence of the experience of the midstream customer; according to the typology of J. Wirtz et al. (2025), the supplier's strategic choice encompasses four archetypes (minimalist, champion,

cherry-picker, fashionista). Enabling value propositions form the potential for the emergence of value-in-use at the midstream tier.



Source: compiled by the author.

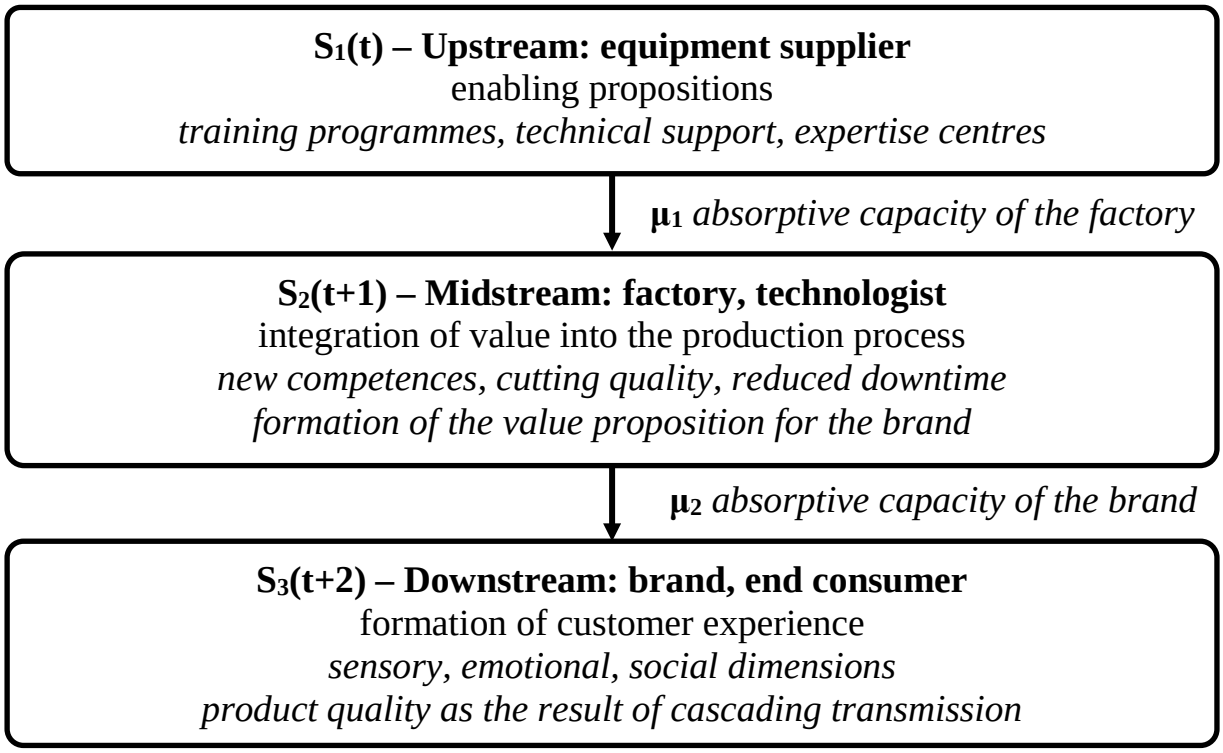
Figure 1. **Mechanism of cascading value transmission between three levels of the production chain $S_1(t) \rightarrow S_2(t+1) \rightarrow S_3(t+2)$ with moderation by absorptive capacity μ**

At the midstream tier, the technologist acquires new competences and the operational range expands. Where absorptive capacity of the factory is sufficient, value transforms into an operant resource and feeds into an enhanced value proposition for the downstream tier. Where capacity is insufficient, transmission halts.

The terminal level accumulates the result of cascading transmission: the sensory, emotional, and social dimensions of the end consumer's experience (Lemon & Verhoef, 2016) are determined by the quality of the product, which depends on the competences of the technologist, conditioned in turn by the enabling propositions of the equipment supplier.

Along three dimensions, the proposed mechanism connects with the pillars of Industry 5.0: the human-centric pillar (recognition of technologists and operators as subjects of development through the enabling propositions of the supplier), the resilience pillar (absorptive capacity as the organisational capability for adaptation in conditions of wartime and supply chain restructuring), and the sustainability pillar (the enhancement of competences of midstream specialists reduces production defects; addressing enabling

propositions to vulnerable social groups realises the inclusive potential of the framework).



Source: compiled by the author.

Figure 2. **Adaptation of the cascading value transmission mechanism to the textile and apparel production chain**

Conclusions. The proposed mechanism of cascading value transmission links three theoretical concepts. Service-dominant logic substantiates the multiplicity of participants of exchange and the subjective nature of value. Absorptive capacity theory provides the moderator that governs transitions between levels. The typology of business-to-business value propositions specifies the input that the upstream supplier delivers into the cascade. Value-in-use received by the beneficiary at one level of the production chain is transformed into an operant resource and integrated by this beneficiary into their own value proposition for the next level, subject to moderation by the absorptive capacity of the recipient participant.

The mechanism has a clear practical implication. Investments by the upstream supplier in the experience of midstream customers (training programmes, technical support, enabling propositions) generate an effect that extends beyond dyadic interaction and propagates to the formation of the end consumer's experience through cascading value transmission. The quality of the end consumer's experience depends on three factors: the point of contact with the brand, the way the equipment supplier has designed conditions for the

development of the factory technologist, and the absorptive capacity of each participant at the intermediate levels of the chain.

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HOW TO CITE THIS ARTICLE
Skorokhodov, I. (2026). Mechanism of cascading value transmission in the textile and apparel industry. *Management*, 1(43): 29–39. https://doi.org/10.30857/2415-3206.2026.1.3.

JEL Classification: L15

UDC 005:614(076)

DOI: 10.30857/2415-3206.2026.1.4

MAIN ORGANIZATIONAL AND ECONOMIC VECTORS OF IMPLEMENTATION OF CERTIFICATION SYSTEMS FOR MEDICAL DEVICE MANAGEMENT

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INTRODUCTION. Implementation of certification systems for quality management (QMS) for medical devices in Ukraine, in particular the ISO 13485 standard (in Ukraine it is valid as DSTU EN ISO 13485:2018), is a critically important requirement for manufacturers, importers and distributors who seek to work in accordance with technical regulations and European standards. This standard is harmonized with EU requirements and provides a presumption of conformity with the technical regulations of Ukraine.

THE PURPOSE OF THE STUDY is to substantiate the main organizational and economic vectors of implementation of certification systems for medical device management.

THE HYPOTHESIS OF THE STUDY is to investigate the organizational and economic vectors of implementation of certification systems for medical device management.

RESEARCH METHODS: generalization, deduction, induction, analysis and synthesis, abstraction.

CONCLUSIONS. Accession to the European Union opens up new political and economic opportunities for the country and contributes to improving the quality of life of every Ukrainian. The implementation of European standards and best practices will ensure modern medicine, transparent conditions for business and reliable protection of citizens' rights. Analysis of the institutional framework revealed that Ukraine has a multi-level regulatory model, within which the ISO 13485 standard, through a mechanism, actually acquires the status of mandatory for manufacturers. The transition of the Ukrainian medical industry to more stringent requirements, similar to the EU Regulations (MDR/IVDR), is justified, which is due to the strategic course towards European integration and the opening of access to the European Union market.

KEYWORDS: harmonization of national legislation with European standards; European standards; implementation of certification systems for medical device management; quality management systems.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
12	0	0

Received: 21.04.2026	Revised: 11.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: L15

УДК 005:614(076)

DOI: 10.30857/2415-3206.2026.1.4

ОСНОВНІ ОРГАНІЗАЦІЙНО-ЕКОНОМІЧНІ ВЕКТОРИ ІМПЛЕМЕНТАЦІЇ СЕРТИФІКАЦІЙНИХ СИСТЕМ МЕНЕДЖМЕНТУ МЕДИЧНИХ ВИРОБІВ

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ВСТУП. Імплементація сертифікаційних систем менеджменту якості (СУЯ) медичних виробів в Україні, зокрема стандарту ISO 13485 (в Україні діє як ДСТУ EN ISO 13485:2018), є критично важливою вимогою для виробників, імпортерів та дистриб'юторів, що прагнуть працювати згідно з технічними регламентами та європейськими стандартами. Цей стандарт гармонізований із вимогами ЄС і забезпечує презумпцію відповідності технічним регламентам України.

МЕТА ДОСЛІДЖЕННЯ: обґрунтувати основні організаційно-економічні вектори імплементації сертифікаційних систем менеджменту медичних виробів

ГІПОТЕЗА ДОСЛІДЖЕННЯ: дослідити організаційно-економічні вектори імплементації сертифікаційних систем менеджменту медичних виробів

МЕТОДИ ДОСЛІДЖЕННЯ: узагальнення, дедукції, індукції, аналізу і синтезу, абстрагування.

ВИСНОВКИ. Вступ до Європейського Союзу відкриває нові політичні та економічні можливості для країни та сприяє підвищенню якості життя кожного українця. Впровадження європейських стандартів і найкращих практик забезпечить сучасну медицину, прозорі умови для бізнесу та надійний захист прав громадян. Аналіз інституційної бази виявив, що в Україні діє багаторівнева регуляторна модель, у рамках якої стандарт ISO 13485 через механізм фактично набуває статусу обов’язкового для виробників. Обґрунтовано перехsl української медичної промисловості до більш жорстких вимог, подібних до Регламентів ЄС (MDR/IVDR), що зумовлено стратегічним курсом на євроінтеграцію та відкриттям доступу до ринку Європейського союзу.

КЛЮЧОВІ СЛОВА: гармонізації національного законодавства з європейськими стандартами; європейські стандарти; імплементація сертифікаційних систем менеджменту медичних виробів; системи менеджменту якості.

Task statement. Implementation of certification systems for medical device management (e.g. ISO 13485) in Ukraine is based on harmonization of national legislation with European standards (EU MDR/IVDR) and introduction of risk-based approaches. This involves a comprehensive transformation of organizational processes and economic justification of investments in quality.

The main organizational and economic vectors include:

1. Organizational vectors (management and process):

• Integration of the quality management system (QMS): Implementation of DSTU ISO 13485 standards, which ensures compliance of medical devices with established safety and functional requirements at all stages of the life cycle.

• Risk-based approach: Risk management for patient safety and product effectiveness, which becomes a critical element of certification.

• Adaptation to healthcare reforms: Interaction of medical institutions and manufacturers with new regulatory requirements, development of leadership and personnel competencies.

• Recognition and certification procedures: Organization of processes for recognizing European certificates (EC) in Ukraine, which simplifies market access and ensures compliance with technical regulations.

2. Economic vectors (financial and market):

• Economic efficiency of quality: Minimization of losses from defects and non-conformities through the functioning of the quality system, which increases the competitiveness of products.

• Investments in certification: Costs for development, implementation, training of personnel and services of notified bodies for conformity assessment.

• Access to markets: Obtaining a certificate of conformity as a mandatory condition for access to the Ukrainian and EU medical device market.

• Crisis management: Formation of sustainable management models capable of adapting to changes, which is important for the pharmaceutical and medical business.

The implementation of these vectors ensures the safety of medical devices and increases the overall economic efficiency of the functioning of medical device enterprises.

The purpose of the study is to substantiate the main organizational and economic vectors of implementation of certification systems for medical device management.

Presentation of the main material

Key aspects of ISO 13485 implementation in Ukraine:

1. Current version and harmonization: Ukraine has DSTU EN ISO 13485:2018, which is identical to the international standard ISO 13485:2016.

2. For whom is it mandatory:

- Manufacturers: Implementation of a QMS is mandatory for Ukrainian manufacturers engaged in the design, development, production, installation and maintenance of medical devices.

- Importers/Distributors: Although certification is often voluntary for them, having an ISO 13485 certificate significantly simplifies conformity assessment procedures and increases trust.

3. Relationship with Technical Regulations: Implementation of ISO 13485 helps to fulfill the requirements of the Technical Regulations:

• No. 753 (medical devices),

• No. 754 (in vitro diagnostics),

• No. 755 (active medical devices).

Stages of system implementation (QMS)

The implementation usually goes through the following steps:

• Diagnostic audit (pre-audit): Analysis of current business processes and documents for compliance with the requirements of the standard.

• Documentation development: Creation of a Quality Manual, standard operating procedures (SOPs), instructions and logs.

• Personnel training: Training employees to work according to new procedures.

• Implementation: Implementation of QMS requirements in production/in the company.

• Internal audit: System verification before certification.

Certification procedure:

1. Selection of a certification body: The body must be accredited (for example, an accredited body such as IMPROVE MEDICAL or USA).

2. Submission of application and documents.

3. Certification audit (two stages):

- Stage 1: Analysis of documentation (preliminary assessment).

- Stage 2: On-site audit (inspection of production areas).

4. Obtaining a certificate: Issuance of a certificate of conformity to ISO 13485 (usually valid for 3 years).

Benefits of implementation:

• Market access: Possibility of free circulation of medical devices in Ukraine and simplified access to EU markets.

• Risk management: Minimization of risks for patients and users.

• Quality control: Ensuring stable product quality and process efficiency.

In Ukraine, the implementation of quality management systems (QMS) for medical devices, in particular according to the ISO 13485 standard, is not only a tool for competitiveness, but also a legislative requirement for the legal sale of products.

Key aspects of implementation in Ukraine in 2026:

1. Legislative obligation:

• The presence of an implemented QMS is mandatory for all classes of medical devices in accordance with the Technical Regulations (CMU Resolutions No. 753, No. 754, No. 755).

• Compliance with the national standard DSTU EN ISO 13485:2018 provides a "presumption of conformity" with the requirements of the technical regulations.

2. Harmonization with the EU (MDR/IVDR):

• During 2025–2026, Ukraine will gradually transition to new rules harmonized with the European regulations MDR (EU 2017/745) and IVDR (EU 2017/746).

• This involves strengthening the requirements for technical documentation, digital product registration and the implementation of the UDI system (unique product identification).

3. Implementation and certification process:

• Documentation development: Creation of risk management procedures (ISO 14971), product traceability, personnel management and infrastructure.

• Audit: Conducted by accredited conformity assessment bodies (e.g. Ukrmetrteststandart, Improve Medical and others), which have a certificate from the National Accreditation Agency of Ukraine (NAAU).

• Support: The organization must keep quality records throughout the product life cycle, but not less than 2 years from the date of release.

Key business benefits:

• Access to international markets: The international ISO 13485 certificate facilitates exports to the EU and other countries.

• Participation in procurement: The presence of a certificate is critical for participation in government tenders and reimbursement programs.

• Quality control: Reduction of the number of defects through clear identification and monitoring at all stages of production.

Research conclusions and prospects. Harmonization of Ukrainian legislation on medical devices with EU regulations (MDR 2017/745 and IVDR 2017/746) is a key stage of Ukraine's European integration in the healthcare sector, planned for 2025–2026. This process involves the transition from outdated directives (MDD) to stricter European safety and quality standards.

Main changes and requirements within the framework of harmonization (2025–2026):

• Strengthening requirements for technical documentation: Manufacturers and importers must update technical files (Technical File), ensuring their compliance with the requirements of Annexes II and III of the MDR/IVDR. This includes detailed data on clinical evaluation, test results and risk management.

• Digital product registration: The creation of a national electronic register of medical devices is being implemented, which is interconnected with the European EUDAMED database. Products must be registered in this register before being placed on the market.

• UDI (Unique Device Identification): The implementation of a UDI is mandatory to improve product traceability. It is expected that UDI (GS1 DataMatrix barcode) marking will become mandatory for high-risk products (IVDR classes C, D and MDR III/IIb).

• Updated classification: Many products, especially in vitro diagnostics, will move to higher risk classes (e.g. from A to B/C/D), which will require the mandatory involvement of Notified Bodies (NBs).

• New requirements for post-marketing surveillance (PMS): Manufacturers are required to implement stricter monitoring systems for products after they are on the market.

Recommendations for business:

1. Update documentation: Start updating technical documentation to MDR/IVDR standards now.

2. Ensure UDI: Adapt labeling and packaging to UDI requirements.

3. Check classification: Make sure that the product classification is correct according to the new rules.

These changes are aimed at increasing the efficiency of conformity assessment procedures and harmonizing the Ukrainian market with the European one, which will ensure better access of patients to quality medical devices.

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HOW TO CITE THIS ARTICLE
Mykhalko, R. (2026). Main organizational and economic vectors of implementation of certification systems for medical device management. *Management*, 1(43): 40–47. https://doi.org/10.30857/2415-3206.2026.1.4.

JEL Classification: Z33

UDC 339.138:004.738.5

DOI: 10.30857/2415-3206.2026.1.5

FORMING A DIGITAL MARKETING STRATEGY

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INTRODUCTION. This article examines the theoretical and methodological foundations for developing a digital marketing strategy in the context of the economy's deep digitalization, the transformation of consumer behavior, and the growing role of online communication channels in business-consumer interactions.

THE PURPOSE OF THE STUDY IS stems from the fact that digital marketing has evolved from a supporting tool into one of the key elements of corporate marketing strategies, and the market volume of online advertising and digital marketing in Ukraine has reached approximately $1.2 billion, with an internet penetration rate of 82.4% of the population.

RESEARCH METHODS. The methodological basis of the study consists of methods of analysis, synthesis, comparison, scientific generalization, and a systematic approach, applied to the analysis of scientific sources by foreign and domestic authors, as well as practical reports from analytical companies. Elements of structural-functional analysis were used to distinguish between the levels of business, brand, marketing, and digital marketing strategies, and methods of classification and content analysis –to systematize types of digital strategies by duration, type of interaction, geography, media type, level of channel integration, and digital directions.

RESALTS. This paper summarizes various methodological approaches to the interpretation of digital marketing and formulates an integrated definition of marketing strategy as a comprehensive system of goals and long-term decisions that combines an action plan and a set of measures for achieving marketing objectives. The content of a digital marketing strategy is revealed as an evolutionary continuation of the classical marketing strategy, based on data, adaptability, multichannel communication, and personalization. The basic methodological frameworks for developing a digital strategy (SOSTAC, RACE, STP) are systematized, and the role of the key performance indicator (KPI) system in ensuring the continuous optimization of marketing activities is defined.

CONCLUSIONS. The practical value of this work lies in the fact that the results obtained can be used by companies to build well-founded digital marketing strategies, develop a set of metrics to evaluate their effectiveness, and select the optimal combination of digital marketing tools depending on the type of interaction, planning horizon, and available resources. The proposed generalizations provide a methodological foundation for further applied research in the field of digital marketing, particularly for the B2B segment.

KEYWORDS. classification of digital strategies; key performance indicators (KPIs); marketing strategy; digital marketing strategy; digital marketing; SOSTAC, RACE, and STP frameworks; digital transformation of businesses.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
42	0	2

Received: 28.04.2026	Revised: 12.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: Z33

УДК 339.138:004.738.5

DOI: 10.30857/2415-3206.2026.1.5

ФОРМУВАННЯ СТРАТЕГІЇ ЦИФРОВОГО МАРКЕТИНГУ

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Вступ. У статті розглянуто теоретико-методологічні засади формування стратегії цифрового маркетингу в умовах глибокої цифровізації економіки, трансформації споживчої поведінки та зростання ролі онлайнових каналів комунікації у взаємодії бізнесу зі споживачем.

Мета дослідження. Актуальність дослідження зумовлена тим, що цифровий маркетинг з допоміжного інструмента перетворився на один із ключових елементів маркетингових стратегій підприємств, а обсяг ринку онлайн-реклами та цифрового маркетингу в Україні сягнув близько 1,2 млрд дол. США за рівня проникнення інтернету у 82,4% населення.

Методи дослідження. Методологічну основу дослідження становлять методи аналізу, синтезу, порівняння, наукового узагальнення та системного підходу, застосовані до опрацювання наукових джерел зарубіжних і вітчизняних авторів, а також практичних звітів аналітичних компаній. Використано елементи структурно-функціонального аналізу для розмежування рівнів бізнесової, бренд-, маркетингової та цифрової маркетингової стратегій, методи класифікації та контент-аналізу – для систематизації видів цифрових стратегій за тривалістю, типом взаємодії, географією, типом медіа, рівнем інтеграції каналів та цифровими напрямами.

Результати. У роботі узагальнено різні методологічні позиції щодо трактування цифрового маркетингу та сформульовано інтегроване визначення маркетингової стратегії як комплексної системи цілей і довгострокових рішень, що поєднує план дій і сукупність заходів для досягнення маркетингових цілей. Розкрито зміст стратегії цифрового маркетингу як еволюційного продовження класичної маркетингової стратегії, але з адаптивністю, мультиканальністю та персоналізацією комунікацій. Систематизовано базові методологічні фреймворки розробки цифрової стратегії (SOSTAC, RACE, STP) та визначено роль системи ключових показників ефективності (KPI) у забезпеченні безперервної оптимізації маркетингових заходів.

Висновки. Практична цінність роботи полягає у тому, що отримані результати можуть бути використані підприємствами для побудови обґрунтованих цифрових маркетингових стратегій, формування комплексу метрик оцінювання їх результативності та обрання оптимального поєднання інструментів цифрового маркетингу, залежно від: типу взаємодії, горизонту планування та доступних ресурсів. Запропоновані узагальнення створюють методичне підґрунтя для подальших прикладних досліджень у сфері цифрового маркетингу, зокрема для B2B-сегменту.

Ключові слова: класифікація цифрових стратегій; ключові показники ефективності (KPI); маркетингова стратегія; стратегія цифрового маркетингу; цифровий маркетинг; фреймворки SOSTAC, RACE, STP; цифровізація підприємств.

Introduction. In today's environment of deepening digitalization, growing data volumes, and shifting consumer behavior patterns, digital communication channels are becoming a key arena for business-market interaction, evolving from a supplementary promotional tool into the core of marketing strategies (Kannan & Li, 2017; Chaffey et al., 2012; Kotler, 2019). Changes in behavioral patterns are accompanied by a reallocation of marketing budgets toward online channels, as evidenced by annual market analytical reviews and reports from specialized agencies (DataReportal, 2025; Ken Research, 2024). For the Ukrainian economy, which is simultaneously influenced by digital transformation processes and structural shocks, the development of well-founded digital marketing strategies is becoming particularly relevant as a factor in maintaining competitiveness and ensuring business sustainability.

An analysis of the current body of research reveals a significant number of studies devoted to specific aspects of digital marketing: defining its nature and functions (Desai, 2019; Marchuk, 2018; Chemorda, 2020), the use of digital communication tools (Bilyk et al., 2020; Holovchuk et al., 2018), the specifics of the hybrid online and offline environment (Harmatiuk, 2021), as well as the role of digital marketing in corporate branding and communication strategies (Yatsiuk, 2015; Liulchak, 2012). At the same time, a narrower range of publications is devoted to the formation of the strategic level of digital marketing (Bondarenko & Riabchyk, 2023; Huynh & Nguyen, 2025; Liu, 2025), and a number of issues remain methodologically debatable. In particular, the terminological distinction between digital marketing strategy and related concepts, the systematization of its classification criteria, the justification for selecting development frameworks, and the integration of a performance metrics system.

A separate gap is the insufficient synthesis of integrated approaches to combining classical strategic frameworks (SOSTAC, RACE, STP) with modern digital trends – personalization, data-driven decision-making, omnichannel approaches, and innovative content creation (Sharafuddin & Janarthanam, 2025; Protsenko, 2025). There is also a lack of critical comparison between foreign and domestic interpretations, which would allow for the formation of a balanced understanding of digital marketing strategy as an evolutionary continuation of classical marketing strategy.

The purpose of this article is to summarize the theoretical and methodological foundations for developing a digital marketing strategy and to systematize its classification criteria, methodological frameworks for development, and performance metrics within the context of the digital economy. To achieve this goal, the following is envisaged: to clarify the conceptual content of the terms "digital marketing", "marketing strategy", and "digital marketing strategy"; to determine the place of the digital marketing

strategy within the structure of strategic enterprise management; systematize the classification criteria of digital strategies; characterize the key methodological frameworks for their development (SOSTAC, RACE, STP) and the integrated KPI system; outline practical guidelines for the integrated use of these tools.

The scientific novelty of this work lies in the combination of foreign and domestic approaches to interpreting digital marketing strategy, the formulation of an integrated definition, and the justification of the comprehensive application of the SOSTAC, RACE, and STP frameworks in conjunction with the KPI system as the basis for the methodology of developing a company's digital marketing strategy.

Materials and Methods. The study employed a combination of theoretical and methodological approaches, which enabled a comprehensive examination of digital marketing strategy as a subject of scientific analysis. The logic of the work involved a sequential progression from clarifying basic concepts to systematizing classification criteria, methodological frameworks, and approaches to evaluating the effectiveness of digital marketing strategies.

In the first stage, methods of analysis, synthesis, and theoretical generalization were applied to review scientific sources that reveal the essence of marketing, digital marketing, and marketing strategy. A sample of scientific publications was formed, covering works by foreign authors and domestic researchers. The criteria for selecting sources were: thematic relevance, year of publication, the presence of a DOI or indexing in scientometric databases, as well as citations in professional publications. This allowed for the formation of a balanced source base, which presents both classical and the latest approaches to the problem under study.

In the second stage, a comparative analysis method was used to compare academic perspectives on the definition of digital marketing and marketing strategy. The approaches were classified according to focus criteria (strategic, instrumental, communicative, resource-based, and optimization-based), which made it possible to identify a common core of meaning and differences in interpretations. Based on this, an integrated definition of marketing strategy and digital marketing strategy was formulated, taking into account the conceptual unity and functional specificity of the categories.

The third stage involved the application of classification methods and structural-functional analysis to systematize types of digital marketing strategies. The classification criteria were: duration (short-, medium-, and long-term strategies); type of interaction (B2C, B2B, C2C, C2B); strategic goals (conversion, image, reputation); geography (local, national, international, global); media type (owned, paid, earned, POEM); level of channel integration (fragmented, integrated); number of channels (single-channel, multi-channel); digital approaches (personalization, data-driven, optimization, innovation,

partnership, risk management). The results of the systematization are summarized in the form of comparative tables and compiled into a single typological scheme.

In the fourth stage, a systematic approach and content analysis method were applied to examine methodological frameworks for developing digital marketing strategies – SOSTAC, RACE, and STP – as well as approaches to establishing a system of key performance indicators (KPIs). Each framework was analyzed based on parameters such as structural elements, purpose, typical implementation tools, and areas of effective application. On this basis, a comparative analysis of the frameworks was developed, and the feasibility of their combined use in comprehensive digital strategies for enterprises was substantiated.

The empirical basis of the study is formed from three groups of sources: scientific publications by foreign and domestic authors, presented in professional journals and scientometric databases; analytical reports from specialized agencies reflecting quantitative parameters of Ukraine's digital marketing market; methodological materials from international professional organizations, in particular the American Marketing Association and Smart Insights. The descriptive statistics presented in the study are drawn from primary analytical reports and used to contextualize the analytical conclusions.

The chosen methodology is reproducible: the sequential implementation of the four stages described, using the appropriate methods and source materials, allows other researchers to replicate the logic of the analysis and verify the results obtained. A limitation of the study is its theoretical and methodological nature – further research should focus on the empirical verification of the proposed generalizations using data from specific companies, primarily in the B2B segment.

Results and Discussion. The deepening digitalization of the economy and sweeping changes in consumer behavior have created a fundamentally new environment in which modern businesses operate. The internet is no longer merely a supplementary channel for information; it has become the primary arena for purchasing decisions, building brand trust, and communication among market participants. According to an analytical report (DataReportal, 2025), as of early 2025, Ukraine had approximately 31.5 million internet users, representing 82.4% of the population, while the number of active mobile connections reached 56.4 million (147% of the population). Such levels of digital technology penetration create the objective conditions for restructuring business-consumer interactions and, consequently, for increasing the importance of digital tools in marketing activities.

The economic impact of these processes is reflected in the structure and size of the advertising market. According to the results of a five-year analysis (Ken Research, 2024), the online advertising and digital marketing market in Ukraine is estimated at approximately $1.2 billion, with Display Advertising,

Search Engine Marketing, Social Media Advertising, and Video Advertising holding the leading positions. The shift in marketing budgets toward digital channels demonstrates that digital marketing has evolved from a supporting tool to one of the leading elements of corporate marketing strategies. This is also underscored by empirical studies (Oklander & Romanenko, 2015), which emphasize that the digital environment creates a qualitatively different space for marketing interaction compared to traditional internet marketing, and (Poliakh, 2020), which highlights the methodological distinction between the tools and functions of digital marketing in modern business.

The conceptual foundation of digital marketing research is based on an understanding of marketing itself as a broader category. According to the American Marketing Association's approach, marketing is viewed as a set of activities, institutions, and processes aimed at creating, communicating, delivering, and exchanging offerings that provide value to consumers, customers, partners, and society at large. The application of this logic to the digital environment has led to the emergence of a new field – digital marketing – which has become the subject of separate academic research. Thus, P. Kotler (2019) proposes viewing it as a process of planning, implementing, and controlling marketing activities using digital channels, focused on attracting customers and building long-term relationships with them. This approach emphasizes the managerial and strategic role of digital channels in the system of consumer relations.

Other authors shift the focus toward an instrumental interpretation. D. Chaffey et al. (2012) define digital marketing as the use of digital technologies in marketing activities to inform consumers about products and services and ensure that the offerings meet their needs. A more applied perspective is offered by V. Desai (2019), who links digital marketing to the use of the Internet, mobile phones, display advertising, and other digital media as a medium for promoting products and services. In contrast, P.K. Kannan & H. Li (2017) offer a broader perspective, interpreting digital marketing as an adaptive, technology-enabled process of collaboration between companies, customers, and partners to jointly create, deliver, and sustain value for all stakeholders. This logic reinforces the idea of networked interaction and co-creation of value, which aligns with the contemporary challenges of the digital economy.

The work of Ukrainian scholars reflects a conceptual affinity with international approaches, while also demonstrating certain distinctive emphases. For example, V. Bilyk et al. (2020) define digital marketing as the marketing of goods and services, the methods and technologies of which involve the use of digital tools at all stages of interaction with consumers. O. Harmatiuk (2021) emphasizes the hybrid nature of the phenomenon, highlighting the combination of online and offline environments. O.O. Marchuk (2018) broadly defines digital

marketing as a term describing the marketing of goods and services using digital channels to attract and retain customers. P.O. Chemorda (2020) views digital marketing as an activity aimed at shaping a specific image of a company or product and eliciting a corresponding response from the audience. A more comprehensive terminological foundation is also provided by the works of V.V. Ruban (2017), which describe the characteristics and functions of digital marketing in domestic practice, as well as the research (Holovchuk et al. 2018) on the communicative potential of digital marketing. Z.S. Liulchak (2012) characterizes the state and prospects of digital marketing development, while D.V. Yatsiuk (2015) emphasizes its role in the future of marketing communications in branding.

A synthesis of the approaches outlined above demonstrates that digital marketing constitutes a multifaceted category, the common core of which lies in attracting and retaining customers while simultaneously creating value for both consumers and businesses. Differences lie primarily in the area of focus: foreign scholars tend toward strategic, process-oriented, and adaptive interpretations, while Ukrainian authors focus more on tools, the hybrid nature of online and offline spaces, and the communicative aspect. This forms the methodological basis for further consideration of marketing strategy as a key tool of digital marketing.

Marketing strategy is a concept with a distinctly heterogeneous interpretation, due to its multifaceted nature. In the academic literature, it is viewed as a program or action plan, a system of goals, a set of strategic measures, a tool for market analysis, a method of influencing consumers, and sometimes even as a company philosophy. In particular, N.V. Kuzmynchuk et al. (2023) interpret it as a comprehensive action plan for product promotion and corporate profit growth. D.L. Melnyk (2009) interprets marketing strategy as a rational logical structure through which a company aims to solve its marketing challenges. S.S. Harkavenko (2010) defines it as a detailed, comprehensive plan for achieving marketing goals. S.Ya. Voitovych & I.P. Potapiuk (2011) emphasize strategic orientation, describing marketing strategy as a course of action that aligns the company’s capabilities with market conditions and includes medium- and long-term decisions regarding target segments and the level of marketing expenditures. D.L. Kobets (2017) focuses on competitive logic, viewing marketing strategy as a formalized plan for developing the company’s interaction with the external environment to secure competitive advantages.

This diversity of interpretations underscores the methodological complexity of the category and, at the same time, calls for an integrated definition. At a general level, it is appropriate to view a marketing strategy as a comprehensive, logically structured system of goals and long-term decisions based on the business’s strategic objectives and comprising an action plan and a set of

measures to align the company's internal capabilities with market conditions, the selection of target segments, promotional tools, and the level of marketing expenditures to achieve marketing goals and ensure profit growth. As noted by N. Struk & O. Kapral (2023), marketing strategy is inextricably linked to the company's overall objective, is consumer-oriented, involves forecasting the market environment, establishing a sustainable competitive position, and serves as the foundation for other functional strategies. N.M. Buniak (2019) and O. Nikolaichuk (2019) develop a similar line of reasoning, emphasizing the methodological role of marketing strategy in forming a comprehensive enterprise management system, while K.A. Levchenko (2018) highlights the specifics of its development in industrial markets and the associated strategic risks.

The digitalization of the business environment is significantly transforming classical marketing strategy, not by eliminating its key features, but by changing their substantive content. This gives rise to a separate category – digital marketing strategy – which adapts the basic principles of marketing to the digital space. A summary of the main approaches to its definition is presented in Table 1.

Table 1

Key academic approaches to defining the concept of "digital marketing strategy"

Author(s)	Main thesis of the interpretation	Key focus
V. Stadnichenko, N. Chukhno	A digital marketing strategy as a system that adapts traditional marketing concepts to modern information environments and enhances a company's overall marketing impact	Adapting traditions to the digital context
V.M. Bondarenko, A. V. Ryabchik	Digital marketing strategy as a new form of marketing that combines traditional and innovative tools, methods, and technologies	A hybrid toolkit
I. Golovachov, O. Bilovodska	Marketing communications strategy in the digital environment as a component of the marketing mix that determines the nature of communicative impact through digital tools	A focus on communication
K.L. Huynh, V.K. Nguyen	Digital marketing strategy as "dynamic digital capability", aligning a company's internal resources with the external environment to achieve sustainable competitive advantages	A capability-resource approach
H. Liu	Digital marketing strategy as an optimization model based on the 4Ps, integrating dynamic pricing and omnichannel capabilities	Quantitative and optimization logic

Source: compiled by the author based on (Bondarenko & Riabchyk, 2023;Kulyniak & Holovetskyi, 2023; Huynh & Nguyen, 2025; Liu, 2025;Holovachov, 2023).

A comparison of these interpretations suggests that a digital marketing strategy is an evolutionary extension of the traditional marketing strategy, shaped by the influence of digitalization. Its key distinguishing features include a high level of adaptability, reliance on data and digital interaction channels, a focus on improving efficiency, and the creation of sustainable competitive advantages (Yankovets, 2022). Within the structure of strategic enterprise management, the digital marketing strategy occupies a clear hierarchical position: it is a component of the marketing strategy, which, in turn, aligns with the brand strategy and is subordinate to the overall business strategy, reflecting a movement from the general to the specific tool (Lanet CLICK).

Digital marketing strategies are categorized based on a wide range of criteria that partly overlap with traditional classification criteria but are supplemented by specific digital parameters (Protsenko, 2025; Yankovets, 2022). Strategies are categorized by duration as short-term (3–6 months), medium-term (about one year), and long-term (over one year). Short-term strategies focus on immediate goals – rapidly driving traffic, generating leads, and increasing conversions; typical tools for these include PPC campaigns, email marketing, remarketing, and active promotion on social media. Medium-term strategies combine a focus on increasing brand awareness, customer retention, and organic traffic growth using content marketing, SEO, email marketing, and digital PR. Long-term strategies involve building a lasting reputation, developing owned media, and forming communities and strategic partnerships in the digital environment (Holovachov, 2023). At the same time, as noted by D. Protsenko (2025), an excessively short planning horizon calls into question the strategic status of such documents and effectively shifts them to the tactical level, highlighting the need for a balance between strategic and tactical planning levels.

Classification by interaction type includes B2C, B2B, C2C, and C2B strategies, each of which has its own logic for creating value. B2C strategies are focused on the mass market and consumer segments; they integrate performance marketing, content marketing, SEO/SEM, automated communication, and the concept of the consumer journey "funnel" (Kulyniak & Holovetskyi, 2023). B2B strategies operate in the realm of interorganizational interaction, characterized by rationality, duration, and the complexity of the decision-making process; they are based on personalized communications that take into account roles within the DMU (Decision-Making Unit), the use of professional platforms and expert content, as well as the active application of CRM systems, marketing automation, and account-based marketing (Bondarenko & Riabchyk, 2023). C2C strategies involve organizing interactions among consumers themselves through social networks, marketplaces, online communities, and sharing platforms, and utilize mechanisms such as UGC, ratings, and mutual

recommendations. C2B strategies involve a situation where the consumer initiates the interaction: companies use reviews, ratings, crowdsourced ideas, and user-generated content to adapt products and build brand trust (Shankar et al., 2021).

Strategic goals are categorized into conversion, image, and reputation strategies: the first aims to increase sales by growing the number of potential customers, the second – to disseminate information about the brand and boost its recognition, and the third – to establish feedback, manage reputation in the digital environment, and improve it (Holovachov, 2023). Geographically, strategies are divided into local, national, international, and global. Within digital classifications specifically, strategies are distinguished by media type (owned, paid, earned, as well as the mixed POEM model), by the level of channel integration (fragmented and integrated), by the number of channels (single-channel and omnichannel/multichannel), as well as by specific digital directions – personalization, data-driven, optimization, innovation, partnership, and risk management strategies (European Economic Letters, 2025). (Sharafuddin & Janarthanam, 2025), in analyzing the scientific literature in the field of digital marketing, additionally highlight the areas of new technology adoption (ANT), innovative content creation (ICC), and customer engagement innovation (CEI), which reflect the innovative nature of modern digital strategies. Highlighting these areas is important because they directly correlate with the concept of "dynamic digital capability" and competitive advantages in an unstable environment (Huynh & Nguyen, 2025).

As the literature review shows, the methodological foundation for developing a digital marketing strategy is formed by a set of complementary frameworks that integrate classic strategic analysis tools with the specific characteristics of the online environment (European Economic Letters, 2025; Shankar et al., 2021). Among the most common are the SOSTAC, RACE, and STP models, as well as the key performance indicator (KPI) system. A comparative overview of these frameworks is presented in Table 2.

The SOSTAC model remains one of the most proven tools in the field of marketing for strategic, marketing, and business planning, thanks to its versatile and logically structured six-step framework (Dudar, 2022). During the situational analysis stage, the company’s internal and external environments are assessed using SWOT and PESTLE analyses, Porter’s "Five Forces", a digital channel audit, and web analytics tools such as Google Analytics, SimilarWeb, SerpStat, and SEMRush. During the goal-setting stage, the SMART, OKR, and 5S approaches are applied, and a KPI system is established. The strategy stage involves the use of STP, the creation of a Customer Journey Map, and the development of a Value Proposition Canvas. At the tactical level, tools are specified through the marketing mix, content strategy, SEO/SEM, SMM, email

marketing, PPC, and the PESO model. The execution and monitoring stages integrate a media plan, content plan, agile practices, CRM, task managers, and a wide range of analytical tools (Google Analytics, Meta Ads, TikTok Ads, Power BI and Tableau dashboards, A/B testing), which ensure the monitoring and continuous optimization of implemented solutions.

Table 2

Comparison of basic methodological frameworks for developing a digital marketing strategy

Framework	Structural elements	Key purpose	Typical implementation tools
SOSTAC	Situation Analysis, Objectives, Strategy, Tactics, Action, Control	Full-cycle strategic planning–from analysis to monitoring	SWOT, PESTLE, Porter's Five Forces, Google Analytics, SMART, OKR, STP, media plan, A/B testing, dashboards
RACE	Reach, Act, Convert, Engage (+ Plan)	Managing the customer engagement funnel at every stage of the customer lifecycle	SEO, contextual and targeted advertising, landing pages, lead magnets, CRM, email marketing, loyalty programs, NPS
STP	Segmentation, Targeting, Positioning	Shifting from a one-size-fits-all approach to personalized marketing solutions	Cluster analysis, demographic/behavioral segmentation, USP development, Value Proposition Canvas
KPI-система	Reach, Act, Convert, Engage – групи показників	Measuring effectiveness and optimizing implemented initiatives	Traffic, CTR, CPC, Engagement Rate, Bounce Rate, Conversion Rate, CPL, ROMI, LTV

Source: compiled by the author based on various sources (European Economic Letters, 2025; Shankar et al., 2021; ITExpert, 2023; Maxym, 2023).

The RACE framework, developed by Smart Insights under Chaffey's leadership, complements strategic planning with an operational level of marketing management, focusing on customer engagement throughout the entire customer lifecycle (Promodo). The classic structure consists of four stages – Reach, Act, Convert, and Engage – to which a fifth stage, Plan, is often added, responsible for defining goals and performance metrics. The Reach stage involves SEO, contextual and targeted advertising, PR, content and influencer marketing, and media advertising; the Act stage involves landing pages, UX/UI optimization, lead magnets, webinars, and email subscriptions; The Convert stage integrates CRM systems, remarketing, personalization, A/B testing, and CRO practices,

while the Engage stage relies on email newsletters, loyalty programs, push notifications, SMM, customer support, and NPS surveys (Maxym, 2023). Unlike SOSTAC, RACE is geared more toward operational optimization, which explains the value of using them together in comprehensive strategies.

The STP concept serves as a methodological bridge between strategic analysis and tactical digital marketing tools, facilitating the transition from a mass-market approach to a personalized one (ITExpert). The sequence "segmentation → targeting → positioning" allows for the identification of homogeneous consumer groups based on demographic, geographic, psychological, and behavioral characteristics, select the most attractive segments based on growth potential and accessibility, and form a clear image of the product or brand in the audience's mind through a unique value proposition. In the digital environment, STP interacts with user behavior analytics, communication automation tools, and targeted advertising, enabling marketing messages to be dynamically adapted to the characteristics of each segment.

The final step in any framework is to establish a system for measuring the effectiveness of marketing activities based on key performance indicators (KPIs) (Maxym, 2023). Current practice involves grouping KPIs according to the stages of the RACE funnel: engagement metrics (Traffic, Reach, CTR, CPC), interaction metrics (Engagement Rate, Bounce Rate, Avg. Session Duration, Pages per Session), conversion (Conversion Rate, CPL, CAC, ROAS), and retention (Retention Rate, LTV, NPS, Repeat Purchase Rate). The systematic use of KPIs creates conditions for continuous strategy optimization, allows for timely responses to changes in audience behavior, and increases the overall return on marketing investment. This is particularly relevant in a turbulent external environment, where the success of a digital strategy is increasingly determined by the speed of data-driven decision-making (Huynh & Nguyen, 2025; Sharafuddin & Janarthanam, 2025).

A synthesis of the analysis conducted demonstrates that a modern digital marketing strategy is a complex, multidimensional system that combines the theoretical foundations of classical marketing, the specific characteristics of the digital environment, and strategic management tools. Its effective development involves the comprehensive application of the SOSTAC, RACE, and STP frameworks, integrated with a KPI system, which ensures the integrity of the process of planning, implementing, and monitoring marketing activities. A key role is played by the strategy's adaptability to changes in the external environment, a data-driven approach as the primary source of management decisions, multichannel communication, and personalized messaging. It is the combination of these characteristics that enables a company to build sustainable competitive advantages, effectively utilize marketing resources, and ensure long-term growth in the digital economy.

Conclusions. The study revealed that digital marketing has evolved from a supplementary communication tool into an independent strategic component of business management, and the quality of its implementation strategy directly influences competitiveness, the speed of entering new market segments, and the resilience of the business model in an unstable external environment. It is argued that the development of a digital marketing strategy should be viewed as a multi-level process of aligning corporate, marketing, and digital objectives with available data on consumer behavior, technological capabilities, and market constraints, which necessitates a shift from a campaign-based, tactical approach to a systematic, value-oriented one.

A review of theoretical approaches has made it possible to clarify the meaning of the term "digital marketing strategy" and distinguish it from related categories – namely, "internet marketing", "marketing strategy", and "communication strategy" – which is essential for correctly defining the object and subject of strategic planning for digital activities.

The systematization of methodological frameworks – SOSTAC, RACE, STP, and the KPI system – has made it possible to propose viewing them not as competing but as complementary tools operating at different levels of the strategic cycle: SOSTAC defines the planning logic, STP – the structure of target positioning, RACE defines the operational interaction funnel, and the KPI system defines the measurement and adjustment loop. It is demonstrated that the effectiveness of a digital marketing strategy depends on a company’s ability to integrate these frameworks into a unified management loop, in which top-level objectives are systematically broken down into specific performance metrics for channels, campaigns, and consumer touchpoints.

It has been shown that the process of developing a digital marketing strategy should be viewed as a sequence of interconnected stages: assessment of digital maturity and the market environment, setting measurable goals, audience segmentation and positioning selection, selection of channels and tools, resource planning, implementation, and continuous monitoring with subsequent adjustment of decisions based on analytical data.

Systematizing modern approaches to evaluating the effectiveness of digital marketing strategies has made it possible to identify their potential for integration into the practices of Ukrainian enterprises as tools for diagnosis, benchmarking, and justifying investments in digital channels.

Prospects for further research include deepening the empirical analysis of how specific components of a digital marketing strategy affect the revenue growth, market share, and customer loyalty of domestic companies; adapting international methods for assessing digital maturity to the Ukrainian context; as well as in the development of applied methodologies for building integrated systems of strategic and operational controlling of digital marketing, taking into

account industry-specific characteristics, wartime constraints, and the potential of artificial intelligence in personalizing the customer experience.

Acknowledgments. None.

Funding. None.

Conflict of interest. None.

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HOW TO CITE THIS ARTICLE
Demchuk, Z. (2026). Forming a digital marketing strategy. *Management*, 1(43): 48–64. https://doi.org/10.30857/2415-3206.2026.1.5.

JEL Classification:
D81, M11

UDC 330.131.7

DOI: 10.30857/2415-3206.2026.1.6

ASSESSMENT OF THE EFFECTIVENESS OF MANAGEMENT OF OIL REFINERIES IN CONDITIONS OF UNCERTAINTY

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INTRODUCTION. For domestic oil refineries, it is important to generalize world experience and develop on its basis a methodological approach to targeted assessment of the effectiveness of management of oil refineries, which involves substantiating the criteria for effectiveness and a set of levers of influence on the process of achieving results.

THE PURPOSE OF THE STUDY IS to substantiate the assessment of the effectiveness of management of oil refineries in conditions of uncertainty.

THE HYPOTHESIS OF THE STUDY is to investigate the organizational and economic set of criteria for the effectiveness of management of the analyzed enterprises in conditions of uncertainty.

RESEARCH METHODS: analysis and synthesis, generalization, abstraction, observation, comparison.

CONCLUSIONS. The assessment of the effectiveness of management of oil refineries is formed in three areas: main performance indicators, productivity indicators and key performance indicators. The assessment process covers all levels of management and monitors the efficiency of oil refining enterprises from the workplace and the work of divisions to administrative management and owners, issuing only general information about the results of activities to the external environment. To implement a theoretical and methodological approach to assessing the efficiency of managing the development of oil refining enterprises in conditions of uncertainty, it is necessary to take into account the state's European integration course and the security situation, implement organizational proposals related to the possibilities of using regional aspects, this will ensure the sustainability and innovativeness of the development of the industry, region and economy.

KEYWORDS: efficiency; innovation; investment assessment; organizational and economic tools; oil refining enterprises; uncertainty.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
10	3	0

Received: 29.04.2026	Revised: 14.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification:
D81, M11

УДК 330.131.7

DOI: 10.30857/2415-3206.2026.1.6

ОЦІНЮВАННЯ ЕФЕКТИВНОСТІ УПРАВЛІННЯ НАФТОПЕРЕРОБНИХ ПІДПРИЄМСТВ В УМОВАХ НЕВИЗНАЧЕНОСТІ

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ВСТУП. Для вітчизняних нафтопереробних підприємств стає важливим узагальнення світового досвіду та розробка на його базі методичного підходу щодо цілеспрямованого оцінювання ефективності управління нафтопереробними підприємствами, який передбачає обґрунтування критеріїв ефективності та комплексу важелів впливу на процес досягнення результатів.

МЕТА ДОСЛІДЖЕННЯ полягає в обґрунтуванні оцінювання ефективності управління нафтопереробними підприємствами в умовах невизначеності.

ГІПОТЕЗА ДОСЛІДЖЕННЯ: дослідити організаційно-економічні набір критерії ефективності управління аналізованих підприємств в умовах невизначеності.

Методи дослідження аналізу і синтезу, узагальнення, абстрагування, спостереження, порівняння.

ВИСНОВКИ. Оцінка ефективності управління нафтопереробними підприємствами сформована за трьома напрямами: основні показники результативності, показники продуктивності і ключові індикатори ефективності. Процес оцінювання охоплює всі рівні управління і проводить моніторинг ефективності нафтопереробних підприємств від робочого місця і роботи підрозділів до адміністративного управління та власників, видаючи в зовнішнє середовище лише загальну інформацію щодо результатів діяльності. Для реалізації теоретико–методичного підходу щодо оцінювання ефективності управління розвитком нафтопереробних підприємств в умовах невизначеності, необхідним є врахування державного євроінтеграційного курсу та безпекової ситуації, впровадження організаційних пропозицій, пов'язаних зі можливостями використання регіональних аспектів, це дозволить забезпечити стійкість і інноваційність розвитку галузі, регіону і економіки.

КЛЮЧОВІ СЛОВА: ефективність; інновації; інвестиційна оцінка; організаційно-економічний інструментарій; нафтопереробні підприємства; невизначеність.

Task statement. Analysis of methods for assessing management effectiveness in conditions of uncertainty, based on the cost approach, which allows us to identify the main difficulties in calculating indicators and barriers to their implementation in the management system of oil refineries:

– at oil refineries, the evaluation methods that are traditionally used do not reflect the real value of enterprises, and therefore cannot be applied without adjustments (Oleksiuk, 2008);

– the formation of the market value of capital takes into account the principles of corporate governance and a developed stock market, which is in the development stage;

– under the influence of martial law, unstable economic situation, dependence on external financing, in particular active inflationary processes, indicators do not allow us to reliably assess the results of past activities in conditions of uncertainty;

– the low level of formation, processing and public provision of information on the profitability of oil refineries does not allow determining average industry indices, risk-free interest rates and other compensation for risks, which complicates the process of determining a reasonable discount rate and assessing the cost of capital expenditures.

Presentation of the main material. Generalization of the advantages and barriers to the implementation of the studied methods allows us to highlight the direction of development of the approach to assessing the effectiveness of management of oil refineries. The modern direction in the formation of methods for assessing the effectiveness of management of oil refineries is associated with the need to use a system of indicators, which allows us to cover the main aspects of the analyzed activity in conditions of uncertainty.

In world practice, various systems of indicators are used, designed to assess the effectiveness of the activities of oil refineries. The study of their characteristics allowed us to highlight the main differences associated with the principles of forming a system of assessment and management by indicators, namely:

1. Indicator systems differ in the objects of study, the choice of critical areas of development and assessment. In the Norton and Kaplan balanced scorecard system, four aspects of the enterprise's activities are highlighted: 1 – training and development, 2 – internal business processes, 3 – relations with consumers (market) and 4 – financial activities (Fig. 1).

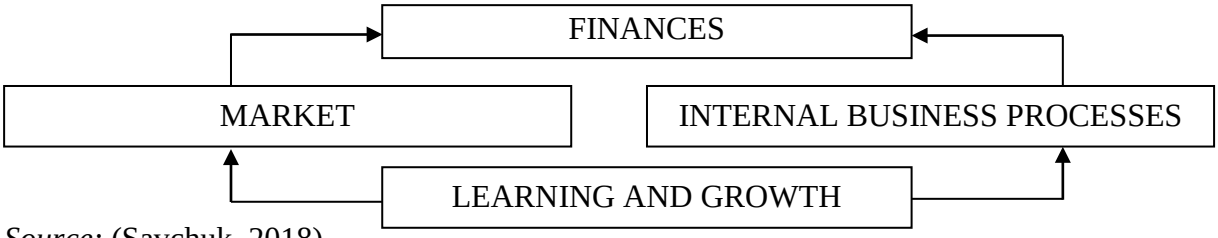
The assessment of the effectiveness of oil refining enterprises development management over a long period of time is carried out using a set of standard elements of the system that provide a holistic picture of the current strategy of enterprises and its dynamics. A balanced system should include measurement indicators in at least four areas:

– financial direction, which considers the effectiveness of oil refining enterprises in terms of return on invested capital;

– evaluation of goods and services of oil refining enterprises in terms of their usefulness for end consumers and investors;

– at the level of business processes, the main processes are assessed, their improvement is carried out in order to form competitive advantages of oil refining enterprises;

– learning and growth, that is, the ability of the organization to perceive new ideas, improve personnel qualifications, implement innovative alternative technologies and organizational procedures of oil refining enterprises.

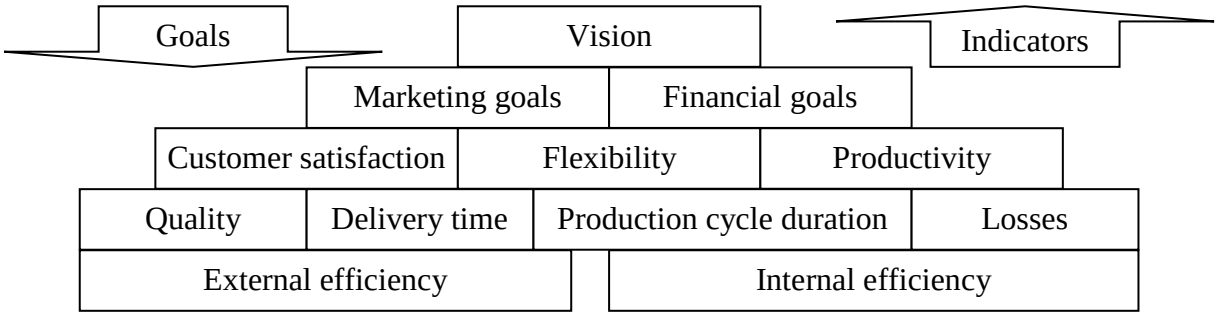


Source: (Savchuk, 2018).

Fig. 1. **Norton and Kaplan Balanced Scorecard**

Meisel's BSC model also defines four perspectives, but instead of the perspective of learning and growth, it uses the perspective of human capital, the formation of corporate culture of oil refining enterprises (Shvydanenko & Shevchuk, 2007).

The model for assessing the effectiveness of development management "Pyramid of Company Activity" by K. McNair, R. Lynch and K. Cross (1990) is focused on identifying and measuring consumer needs (Fig. 2).



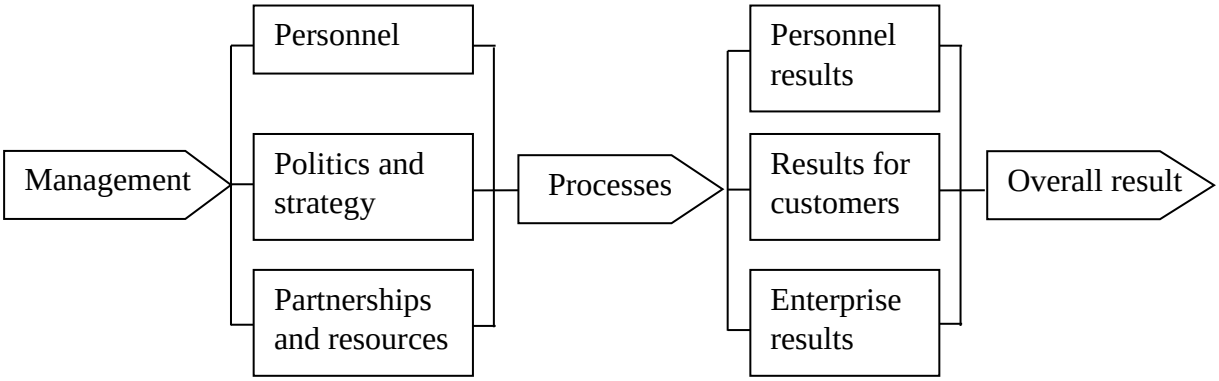
Source: (Shcherbak, 2009).

Fig. 2. **Model for assessing the effectiveness of development management "Company Activity Pyramid"**

A distinctive feature of this model is the formation of indicators of external and internal efficiency, as well as four levels of the organizational structure of oil refineries: at the highest level, managers form the mission of enterprises, at the second level they determine the goals of divisions, the third level is a

connecting link between the upper levels and the lower, associated with the assessment of the operational activities of oil refineries. That is, the system of indicators is formed so that the operational tasks of the lower level are linked to financial indicators at the upper level through the assessment of external interaction with consumers and the effectiveness of internal operations of oil refineries.

The European Foundation for Quality Management (EFQM) model is built on the assessment of two areas: opportunities and results, as can be seen from Fig. 3 (Armin, 1998).



Source: (Armin, 1998).

Fig. 3. **Model of the European Fund for Quality Management of Business Activities of Oil Refineries**

The model is aimed at assessing the process of achieving results related to business activities as a whole, its main features include continuous improvement of operational efficiency, elimination of shortcomings.

2. Indicator systems have different goals and objectives. It has been established that the main goal of the Balanced Scorecard model is to ensure the implementation of the mission and strategy of the enterprise through operational tasks. The model for assessing the effectiveness of management of the development of oil refineries "Pyramid of Company Activities" is based on the concept of total quality management, it assumes active growth of internal efficiency by accounting for costs by types of activities in the chain of activities. The European Quality Management Foundation model is a self-assessment and analysis tool, on the basis of which a conclusion is drawn about the progress and results of the activities of oil refineries within the framework of total management

According to the results of the study, it was found that the distinctive properties of the considered models are as follows: the models take into account the role of financial and non-financial indicators, tangible and intangible capital, which allows a more complete assessment of the direction of the enterprise's development and factors affecting performance; the systems allow for the

identification of critically important indicators at each level of management and facilitate the understanding of the tasks set for each employee. When developing a scientifically sound methodological approach to the effectiveness of management of the development of oil refining enterprises by indicators, it is necessary to take into account that Western concepts were created in a market environment with a high level of application of information and management technologies, as well as a developed market for intellectual capital (Zaichenko, 2019). Therefore, the formation and implementation of a system of indicators of the effectiveness of management of the development of oil refining enterprises should be accompanied by some adjustments (Nifatova, 2017): the use of three projections (1 – finance, 2 – market, 3 – internal business processes: product, process) will allow the system to manage oil refining enterprises more flexibly; the introduction of an innovation and investment direction in each projection will allow oil refining enterprises to keep up with scientific and technological progress and promptly monitor the level of qualitative development.

Including indicators of added value assessment in the structure of the scorecard will eliminate one of the system's shortcomings: the EVA indicator can be a financial indicator of the quality of management decision-making, in turn, the scorecard will allow us not to consider financial indicators only in the short term.

According to the results of the study, it is worth highlighting a number of problems associated with the use of scorecards as a mechanism for assessing and managing efficiency (Bahancov & Erohina, 2019): the complexity of determining key indicators and the relationship between them, which can lead to a multiplicity of goals; it is difficult to establish cause-and-effect relationships between strategic goals; it is difficult to create an effective incentive system aimed at maximizing the potential of personnel in achieving the overall goal.

The justification for choosing a scorecard according to three projections depends on the economic situation in the market space and at the enterprise. Solving the tasks involves obtaining an effective result through the use of new approaches and technologies.

Market projection is aimed at organizing effective interaction of oil refineries with other representatives of the market environment, such as consumers and suppliers. It determines the competitive position of the enterprise in the market, forms market policy and provides external information, on the basis of which the choice of the path of development of internal business processes of oil refineries is made.

We emphasize that the effectiveness of the functioning of the market projection affects not only the relationship between oil refining enterprises and the consumer with the subsequent formation of the enterprise's profitability, but also the determination of the enterprise's internal policy regarding production

and organizational processes. The financial projection of the improved system of indicators reflects the results of the activities of oil refining enterprises, the functioning of all components of the system that are characterized by efficiency. At the same time, the creation of a methodological approach to assessing the effectiveness of management of oil refining enterprises should be carried out taking into account the concept of economic added value management and the levers of cost accumulation associated with development (Shvydanenko & Shevchuk, 2007).

Conclusions and prospects of research. Based on the results of the analysis of world experience in forming an effective management system, the following levels of development have been substantiated and determined:

– management of internal capabilities of oil refining enterprises;

– management of the enterprise as an open system;

– management based on the search for new competitive opportunities.

The results of the study confirm that the management system that has developed at Ukrainian oil refineries is developing within the framework of the general evolutionary management system and corresponds to levels 1–2. The lag behind global trends is associated with insufficient experience in operating in market conditions, the lack of theoretical methods, which led to gradual development.

Acknowledgments. None.

Funding. None.

Conflict of interest. None.

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HOW TO CITE THIS ARTICLE
Hanushchak-Yefimenko, L. (2026). Assessment of the effectiveness of management of oil refineries in conditions of uncertainty. *Management*, 1(43): 65–72. https://doi.org/10.30857/2415-3206.2026.1.6.

JEL Classification: M31, M37

UDC 004.8:005.8: 355.4:659.1:159.9

DOI: 10.30857/2415-3206.2026.1.7

ARTIFICIAL INTELLIGENCE IN THE PROJECT MANAGEMENT SYSTEM FOR DIGITALIZATION OF MILITARY MARKETING: PSYCHOLOGICAL MECHANISMS OF ADVERTISING INFLUENCE

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INTRODUCTION. Under the conditions of communication digitalization and growing competition for human resources, military marketing increasingly requires project-managed approaches to the planning, personalization, and optimization of recruitment messages. Artificial intelligence serves as a tool for automated audience segmentation, prediction of behavioral responses, adaptation of creative content, and improvement of the effectiveness of digital campaigns. At the same time, the use of algorithmic technologies intensifies the risks of distrust, advertising avoidance, cognitive overload, and privacy concerns. This makes it necessary to provide a scientific substantiation of a model that integrates artificial intelligence tools, digitalization project management, and psychological mechanisms of advertising influence within the system of military recruitment.

RESEARCH HYPOTHESIS. The hypothesis consists in substantiating that the effectiveness of digital recruitment communications in military marketing increases when artificial intelligence is integrated into the project management system while simultaneously ensuring control over psychological indicators of trust, transparency of AI involvement, authenticity, cognitive load, and the risk of advertising avoidance.

PURPOSE. To identify the patterns of integrating artificial intelligence tools into the project-based framework of planning, monitoring, and optimization of digital recruitment communications in military marketing by operationalizing psychological mechanisms of advertising influence in the form of measurable indicators of effectiveness, trust, and advertising avoidance.

METHODS. Content analysis of publicly available digital recruitment messages; purposive bibliographic selection of scientific sources; comparison; abstraction; synthesis; operationalization of psychological constructs on a 0–100 scale; mathematical modeling; descriptive statistics; regression-based calibration of weights for integrated indicators; interpretive analysis.

CONCLUSIONS. In the context of military marketing digitalization, artificial intelligence not only enables the scaling and personalization of recruitment messages but also requires systematic project-based control over the psychological consequences of advertising influence. The proposed model makes it possible to integrate AI tools with indicators of trust, transparency, authenticity, cognitive load, social media fatigue, and privacy-related risks. The feasibility of using three integrated indicators has been substantiated: AIPCS for assessing the predicted potential of recruitment effectiveness, AAP for determining the algorithmic potential for advertising avoidance, and APGI for evaluating the quality of managerial configuration of AI-assisted advertising communications. The practical value lies in the possibility of applying these indicators at control points within digitalization projects in military recruitment.

KEYWORDS: military marketing; artificial intelligence; project digitalization management; digitalization; recruitment communications; advertising psychology; advertising influence; trust; cognitive load; advertising avoidance.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
29	5	3

Received: 28.04.2026	Revised: 15.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: M31, M37

УДК 004.8:005.8: 355.4:659.1:159.9

DOI: 10.30857/2415-3206.2026.1.7

ШТУЧНИЙ ІНТЕЛЕКТ У СИСТЕМІ УПРАВЛІННЯ ПРОЄКТАМИ ЦИФРОВІЗАЦІЇ ВІЙСЬКОВОГО МАРКЕТИНГУ: ПСИХОЛОГІЧНІ МЕХАНІЗМИ РЕКЛАМНОГО ВПЛИВУ

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ВСТУП. В умовах цифровізації комунікацій та зростання конкуренції за людський ресурс військовий маркетинг дедалі більше потребує проєктно керованих підходів до планування, персоналізації та оптимізації рекрутингових повідомлень. Штучний інтелект виступає інструментом автоматизованої сегментації аудиторій, прогнозування поведінкових реакцій, адаптації креативів і підвищення ефективності цифрових кампаній. Водночас використання алгоритмічних технологій посилює ризики недовіри, рекламного уникнення, когнітивного перевантаження та занепокоєння приватністю. Це актуалізує потребу у науковому обґрунтуванні моделі, яка поєднує інструменти штучного інтелекту, управління проєктами цифровізації та психологічні механізми рекламного впливу в системі військового рекрутингу.

ГІПОТЕЗА ДОСЛІДЖЕННЯ. Полягає в обґрунтуванні того, що ефективність цифрових рекрутингових комунікацій військового маркетингу підвищується за умови інтеграції штучного інтелекту в систему проєктного управління з одночасним контролем психологічних індикаторів довіри, прозорості AI-участі, автентичності, когнітивного навантаження та ризику рекламного уникнення.

МЕТА. Встановити закономірності інтеграції інструментів штучного інтелекту в проєктний контур планування, моніторингу та оптимізації цифрових рекрутингових комунікацій військового маркетингу шляхом операціоналізації психологічних механізмів рекламного впливу у вигляді вимірюваних індикаторів ефективності, довіри та уникання реклами.

МЕТОДИ. Контент-аналіз відкритих цифрових рекрутингових повідомлень; цілеспрямований бібліографічний відбір наукових джерел; порівняння; абстрагування; синтез; операціоналізація психологічних конструктів у шкалі 0–100; математичне моделювання; описова статистика; регресійне калібрування ваг інтегральних індикаторів; інтерпретаційний аналіз.

ВИСНОВКИ. У контексті цифровізації військового маркетингу штучний інтелект забезпечує не лише масштабування та персоналізацію рекрутингових повідомлень, а й потребує системного проєктного контролю психологічних наслідків рекламного впливу. Запропонована модель дозволяє поєднати інструменти AI з індикаторами довіри, прозорості, автентичності, когнітивного навантаження, соціальної втоми та приватнісних ризиків. Обґрунтовано доцільність використання трьох інтегральних показників: AIPCS – для оцінювання прогнозованого потенціалу рекрутингової результативності, AAP – для визначення алгоритмічного потенціалу уникнення реклами, APGI – для оцінювання якості управлінського налаштування AI-асистованих рекламних комунікацій. Практична цінність полягає у можливості застосування цих індикаторів у контрольних точках проєктів цифровізації військового рекрутингу.

КЛЮЧОВІ СЛОВА: військовий маркетинг; штучний інтелект; управління проєктами цифровізації; цифровізація; рекрутингові комунікації; психологія реклами; рекламний вплив; довіра; когнітивне навантаження; уникання реклами.

Statement of the problem and its relation to important scientific and practical tasks. The digitalization of military marketing in the context of increasing competition for human resources requires the transition from fragmented advertising activity to a project-oriented system of planning, monitoring, and optimization of recruitment communications. The use of artificial intelligence creates new opportunities for automated segmentation, personalization of messages, creative testing, forecasting of behavioral responses, and cross-platform management of digital recruitment campaigns. At the same time, the implementation of AI in military marketing is associated with significant psychological and managerial risks. Algorithmic personalization may increase distrust, advertising avoidance, cognitive overload, social media fatigue, and privacy concerns among target audiences. Therefore, an important scientific and practical task is to develop a model that combines artificial intelligence tools with digitalization project management and measurable psychological indicators of advertising influence. Such an approach makes it possible to evaluate not only the technical effectiveness of digital campaigns, but also the quality of trust formation, transparency of AI involvement, authenticity of communication, and the risk of audience resistance.

The purpose of the study. The purpose of the study is to substantiate the use of artificial intelligence within the project management system of military marketing digitalization by operationalizing psychological mechanisms of advertising influence and transforming them into measurable indicators suitable for planning, monitoring, and optimizing digital recruitment communications.

Analysis of recent publications on the problem. Recent scientific publications form a relevant theoretical basis for studying artificial intelligence in military marketing, algorithmic persuasion, digital recruitment communications, and project management digitalization. M. Dehnert and P. Mongeau (2022) analyzed persuasion in the age of artificial intelligence and emphasized that AI-based communication changes the mechanisms of intention formation, source perception, and ethical responsibility in persuasive interaction. M. Eisend and F. Tarrahi (2022) examined persuasion knowledge in the marketplace and demonstrated that the recognition of persuasive intent increases audience criticality and may stimulate advertising avoidance. S. Alavi, P. Iyer and L. Bright (2024) studied advertising avoidance in algorithmic media and proved the importance of social media fatigue, algorithmic literacy, and privacy concerns in shaping users' reactions to personalized advertising. H. Voorveld, C. Meppelink and S. Boerman (2024) investigated consumers' persuasion knowledge of algorithms in social media advertising and identified differences in awareness, perceived appropriateness, and coping ability among user groups.

The issue of artificial intelligence in marketing and consumer psychology was systematized by M. Mariani, R. Perez-Vega and J. Wirtz, who emphasized

the role of transparency, perceived fairness, and user control in the acceptance of AI-supported marketing decisions. The problem of AI disclosure and its impact on trust was examined by B. Koning and H. Voorveld (2025), while O. Schilke and M. Reimann (2025) substantiated the transparency dilemma, showing that disclosure of AI involvement may reduce trust when audiences perceive communication as less authentic. A. Kirkby, C. Baumgarth and J. Henseler (2023) further specified the influence of AI-disclosed brand voice on perceived authenticity and attitude, which is especially important for recruitment communication, where institutional trust is a critical factor.

In the field of military recruitment and strategic communication, S. Dashiell (2024) analyzed gamification in social media posts related to military recruitment and showed its role in increasing engagement and symbolic attractiveness. E. Hedling, E. Edenborg and S. Strand (2022) examined influencer marketing and identity representation in NATO-related communication, demonstrating the importance of cultural and identity frames in military messaging. K. Mann (2025) considered the use of AI and VR in immersive military recruitment simulations and emphasized the need to evaluate psychological effects such as presence, trust, and cognitive load. In the field of project management digitalization, C. Marnewick and A. Marnewick substantiated the transition toward data-driven project management, while J. Reiff and D. Schlegel analyzed hybrid project management approaches as a response to uncertainty and the need for adaptive control.

At the same time, despite the significant contribution of these researchers, the existing literature does not sufficiently integrate artificial intelligence tools, psychological mechanisms of advertising influence, and project management indicators into a unified model for the digitalization of military marketing. This determines the scientific relevance of the present study and justifies the need to develop measurable indicators for assessing trust, transparency, cognitive load, advertising avoidance, and managerial configuration of AI-assisted recruitment communications.

Materials and methods. The empirical basis of the study consisted of publicly available digital recruitment messages in military marketing distributed through YouTube, Instagram, Facebook, TikTok, X, and related recruitment platforms. The research included video messages, short-form videos, static posts, advertising texts, and multimedia creatives with unified metadata on platform, format, duration, personalization features, disclosure indicators, and available interaction metrics. The methodological basis included content analysis, purposive bibliographic selection of recent scientific sources, comparison, abstraction, synthesis, operationalization of psychological constructs on a unified 0–100 scale, mathematical modeling, descriptive statistics, sensitivity analysis, and regression-based calibration of the weights of

integrated indicators. The study developed and substantiated three project-relevant indicators: AI-Project Control Score (AIPCS) for assessing predicted recruitment effectiveness, Algorithmic Avoidance Potential (AAP) for evaluating the risk of advertising avoidance, and Algorithmic Persuasion Governance Index (APGI) for measuring the quality of managerial configuration of AI-assisted advertising communication.

Statement of the main results and rationale. The obtained results established a formalized relationship between the use of artificial intelligence in the project framework of military marketing digitalization and the psychological mechanisms of advertising influence that determined the manageability of recruitment outcomes in digital channels. It was established that the key contribution of artificial intelligence to the management of recruitment digitalization projects was manifested not in the maximization of individual reach metrics, but in increasing the reproducibility of the persuasion effect through the standardization of message components, control over the transparency of AI involvement, optimization of cognitive load, and reduction of the conditions for advertising avoidance associated with overload and privacy.

The substantiation of the size of the empirical field of digital recruitment messages was carried out by comparing the observed scale of relevant content with the needs of project measurement. In the open environment of social platforms, the volume of recruitment-related content proved to be substantially higher than typical manual samples of creatives; indicatively, tens of thousands of relevant posts and extremely high view counts were recorded even for a single thematically related hashtag on TikTok.

Under these conditions, the empirical array for project analysis was operationalized as a stratified sample of public recruitment messages from five platforms, where the unit of analysis was an individual message or advertising creative. The corpus was formed in the amount of 2,750 messages with a distribution by platforms presented in Fig. 1, which ensured sufficiency for robust estimates of the relationships between psychological variables and integrated indicators of manageability.

The key result was the establishment that, in the management of projects for the digitalization of military marketing, it is advisable to separate the effect of influence from the risks of avoidance, since artificial intelligence simultaneously enhanced the scaling and variability of creatives and increased the likelihood of negative psychological reactions in cases of low transparency and a growing sense of surveillance and overload. For this purpose, three new indicators suitable for inclusion in the control points of project management were developed.

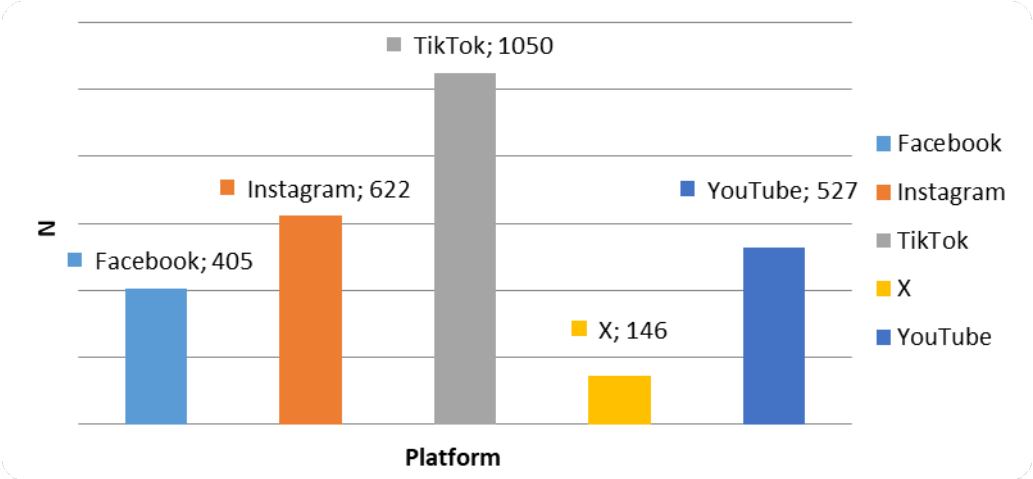
The first indicator, the AI-Project Control Score, denoted as AIPCS, was defined as the predicted integrated potential of recruitment effectiveness, taking

into account the psychological mechanisms of trust, transparency, and overload. The index was specified in probabilistic form in order to avoid informal constraint operators and to ensure an interpretable 0–100 scale:

$$AIPCS = 100 \cdot \sigma(z), \quad (1)$$

$$z = \alpha_0 + \alpha_1 \frac{TI}{100} + \alpha_2 \frac{DC}{100} + \alpha_3 \frac{AU}{100} + \alpha_4 \frac{DR}{100} - \alpha_5 \frac{CL}{100} - \alpha_6 \frac{SMF}{100} - \alpha_7 \frac{PC}{100},$$

where $\sigma(z) = \frac{1}{1+e^{-z}}$ is the logistic function, trust intent (TI) denoted the intention of trust in the message and the source, disclosure clarity (DC) denoted the transparency and comprehensibility of the disclosure of artificial intelligence involvement, authenticity cues (AU) denoted the strength of authenticity signals, diversity balance (DR) denoted the balance of representation, cognitive load (CL) denoted cognitive load, social media fatigue (SMF) denoted social fatigue, and privacy concern (PC) denoted privacy concern. It was established that the variability of AIPCS across platforms was systematically consistent with differences in content consumption formats, while the average AIPCS values on YouTube were higher compared with short-form streams, where overload and fatigue were found to be higher (Table 1).



Source: proposed by the author.

Fig. 1. **Number of messages in the sample (N) by platform**

The second indicator, Algorithmic Avoidance Potential, denoted as AAP, was introduced to assess the probability of active advertising avoidance under the conditions of an algorithmic environment and AI-assisted communication. It was defined as:

$$AAP = 100 \cdot \sigma(u), \quad (2)$$

$$u = \beta_0 + \beta_1 \frac{AO}{100} + \beta_2 \frac{SMF}{100} + \beta_3 \frac{PC}{100} + \beta_4 \frac{CL}{100} - \beta_5 \frac{AL}{100} - \beta_6 \frac{DC}{100},$$

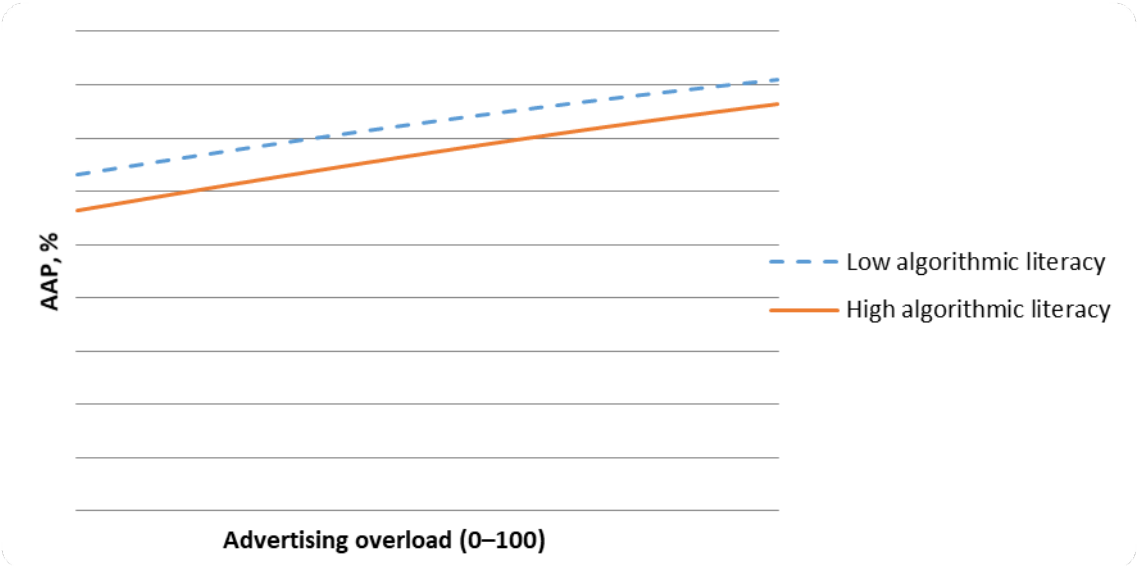
where AO denoted the perception of advertising overload, and AL denoted algorithmic literacy. It was found that AAP was maximized in short-form environments with high advertising pressure, which was consistent with theoretical assumptions regarding the role of fatigue and privacy in advertising avoidance. The dependence of AAP on overload intensified at low levels of algorithmic literacy, which was illustrated in Fig. 2 and corresponded to the logic of consumer segmentation according to the ability to recognize and control algorithmic.

Table 1

Descriptive statistics of indicators by platform

Platform	N	Share of AI-assisted messages, %	AIPCS mean	AIPCS SD	CR mean	CR SD	Trust mean	Load mean	AAP mean
Facebook	405	27.9	37.33	11.48	50.87	16.33	51.13	63.77	69.54
Instagram	622	36.0	35.07	11.15	50.76	16.23	50.19	63.47	72.41
TikTok	1050	50.1	30.87	10.52	48.44	16.95	48.55	69.23	76.54
X	146	21.2	37.47	11.72	50.90	17.67	50.54	63.50	62.14
YouTube	527	32.3	41.82	11.89	51.29	16.30	51.68	58.18	63.09

Source: proposed by the author.



Source: proposed by the author.

Fig. 2. **Predicted AAP at different levels of algorithmic literacy**

The third indicator, the Algorithmic Persuasion Governance Index, denoted as APGI, was formed as a managerial index of the quality of project configuration of AI-assisted advertising, which reflected the balance between persuasion enhancers and penalties for overload and avoidance risks. To avoid arbitrariness of weights, they were estimated as calibration parameters from empirical data through a standardized regression model of the dependence of the

conversion proxy on the components. Positive standardized coefficients were normalized into enhancement weights, and negative coefficients into penalty weights:

$$w_j = \frac{\max(0,\tilde{\beta}_j)}{\sum_{k\in\mathcal{P}}\max(0,\tilde{\beta}_k)}, j \in \mathcal{P}, \quad (3)$$

$$\lambda_m = \frac{\max(0,-\tilde{\beta}_m)}{\sum_{r\in\mathcal{N}}\max(0,-\tilde{\beta}_r)}, m \in \mathcal{N}, \quad (4)$$

where $\tilde{\beta}$ denoted the standardized coefficient, Pcontained the enhancers DC, AU, AL, DR, GI, and Ncontained the penalties SMF, PC, CL. After calibration, the index was defined on a 0–100 scale as:

$$APGI = B_{0,100}\left(100\left[\sum_{j\in\mathcal{P}} w_j x_j - \sum_{m\in\mathcal{N}} \lambda_m y_m\right]\right), \quad (5)$$

where x_j and y_m denoted the corresponding normalized components, and the bounding function was defined strictly mathematically as:

$$B_{0,100}(x) = \min\{100, \max\{0, x\}\}. \quad (6)$$

These "normalized weights" were calculated as calibrated shares of contribution from the estimated coefficients of the regression model, separately for "enhancers" (positive effects) and separately for "penalties" (negative effects).

1. Initial coefficients (Estimate from Table 2)

For enhancers (β > 0):
- disclosure clarity: β = 0.093593;
- authenticity cues: β = 0.019218;
- algorithmic literacy: β = 0.015119;
- diversity balance: β = 0.063593;
- gamification intensity: β = 0.034911.

For penalties (β < 0):
- social_media fatigue: β = −0.111365;
- privacy concern: β = −0.083590;
- cognitive load: β = −0.214299.

2. Formula for weight normalization

Enhancers:

$$w_j^+ = \frac{\max(0,\beta_j)}{\sum_{k\in\mathcal{P}}\max(0,\beta_k)}, \quad (7)$$

where $\mathcal{P}$– is the set of positive components.

Sum of positive coefficients:

$$\sum\beta^+ = 0{,}093593 + 0{,}019218 + 0{,}015119 + 0{,}063593 + 0{,}034911 = 0{,}226434.$$

Then:
- disclosure clarity: 0.093593 / 0.226434 = 0.413;
- authenticity cues: 0.019218 / 0.226434 = 0.085;

• algorithmic literacy: 0.015119 / 0.226434 = 0.067;
• diversity balance: 0.063593 / 0.226434 = 0.281;
• gamification intensity: 0.034911 / 0.226434 = 0.154.

Penalties. They are normalized by the absolute values of the negative coefficients:

$$w_j^- = \frac{\max(0,-\beta_j)}{\sum_{k\in\mathcal{N}}\max(0,-\beta_k)}, \quad (8)$$

where $\mathcal{N}$ – is the set of penalty components.

Sum of the absolute values of the penalties:

$$\sum |\beta^-| = 0{,}111365 + 0{,}083590 + 0{,}214299 = 0{,}409254.$$

Then:

- social media fatigue: $0{,}111365/0{,}409254 = 0{,}272$;
- privacy concern: $0{,}083590/0{,}409254 = 0{,}204$;
- cognitive load: $0{,}214299/0{,}409254 = 0{,}524$.

The weight values were obtained by normalizing the estimated coefficients β within two groups of components. For enhancers, normalization by the sum of positive coefficients $\sum\beta^+ = 0{,}226434$, was used, while for penalties, normalization by the sum of the absolute values of negative coefficients $\sum |\beta^-| = 0{,}409254$, was used, which ensured $\sum_{j\in\mathcal{P}} w_j^+ = 1$ and $\sum_{j\in\mathcal{N}} w_j^- = 1$ provided the weights with the interpretation of the relative share of a component's contribution to the predictive capacity of the model. In the enhancement block, the component clarity of disclosure received the highest normalized weight, since its estimated coefficient β = 0.093593 was the largest among the positive effects, and normalization established w = 0.413, that is, approximately 41.3% of the total "positive" strength of influence; the component diversity balance had β = 0.063593 and w = 0.281, which corresponded to 28.1% of the aggregate positive contribution; the component gamification intensity with β = 0.034911 formed w = 0.154, which was interpreted as 15.4% of the total positive influence; the component authenticity cues had β = 0.019218 and w = 0.085, that is, 8.5% in the structure of enhancers; the smallest weight in this group was formed by the component algorithmic literacy with β = 0.015119 and w = 0.067, which corresponded to 6.7% of the total positive contribution. In the penalty block, cognitive load appeared to be the dominant factor: with β = -0.214299, normalization by the sum of the absolute values of negative effects gave w = 0.524, that is, approximately 52.4% of the total "negative" strength of influence of the penalties, which confirmed the determining role of message overload in reducing effectiveness; the component social media fatigue had β = -0.111365 and w = 0.272, which was interpreted as

27.2% of the total penalty influence; the component privacy concern with β = -0.083590 formed w = 0.204, which meant 20.4% of the aggregate penalty effect and confirmed its negative but relatively weaker influence compared with cognitive load and fatigue from the communication environment.

The obtained weights, presented in Table 2, confirmed that in the structure of enhancers the greatest contribution was made by the transparency of AI involvement disclosure and authenticity, whereas among the penalties social fatigue and cognitive load dominated. This was consistent with the results of studies on the ambivalence of transparency, when AI disclosure may increase awareness but, under certain conditions, reduce trust if authenticity is not supported by the message design and the reputational framework of the source.

Table 2

Calibrated weights for the APGI managerial configuration index

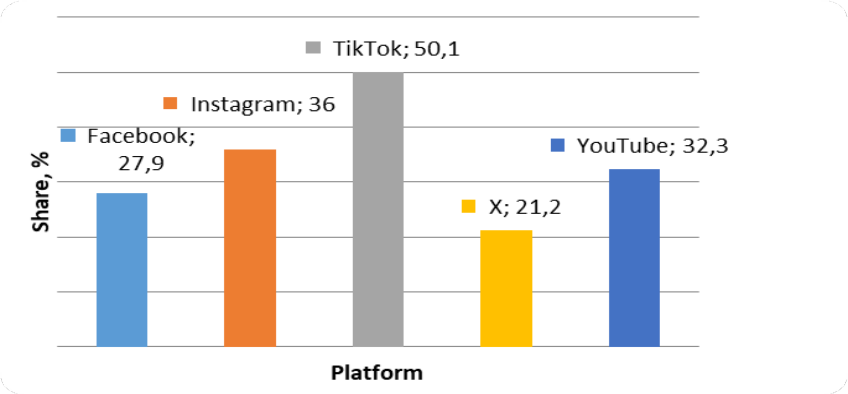
Component	Role	β (reference)	Σ (group)	Weight "w" (normalized)
Disclosure clarity	Enhancer	0,093593	0,226434	0,41333457
Authenticity cues	Enhancer	0,019218	0,226434	0,084872413
Algorithmic literacy	Enhancer	0,015119	0,226434	0,066770008
Diversity balance	Enhancer	0,063593	0,226434	0,280845633
Gamification intensity	Enhancer	0,034911	0,226434	0,154177376
Social_media fatigue	Penalty	-0,111365	0,409254	0,272117072
Privacy concern	Penalty	-0,08359	0,409254	0,204249684
Cognitive load	Penalty	-0,214299	0,409254	0,523633245

Source: proposed by the author.

The summary statistics (Table 1) showed that the share of AI-assisted messages in the sample differed substantially across platforms (Fig. 3), while the relationship between transparency and trust had different densities for AI-assisted and non-assisted messages (Fig. 4). Additionally, the correlation structure (Fig. 5) confirmed unidirectional relationships of AIPCS with trust and transparency and oppositely directed relationships with privacy, fatigue, and load, which supported the causal interpretation of the obtained results within psychological approaches to information processing and avoidance of advertising influence.

For the formal substantiation of the effects, a parametric model was estimated, in which the dependent variable was the conversion proxy indicator, while the explanatory variables were psychological and algorithmic predictors. Table 3 presented the model parameters in a standard statistical form. The column "Parameter" contained the name of the estimated model coefficient, "Estimate" contained the numerical estimate of the coefficient, "SE" contained the standard error of the estimate, "t" contained the t-statistic defined as the ratio "Estimate/SE", and "p" contained the two-tailed probability for the corresponding t, used for interpreting the statistical significance of the effect. The presentation of

t and p as ready values ensured the unambiguous reproduction of the interpretation of effects within the OLS approach without discrepancies in the implementation of calculations in spreadsheet processors. It was established that trust intention and transparency of AI involvement disclosure demonstrated a statistically significant positive relationship with effectiveness, whereas privacy, fatigue, and load formed a negative contour of influence, which corresponded to the logic of the "dual contour" of AI advertising, where effectiveness depended on the management of avoidance risks.

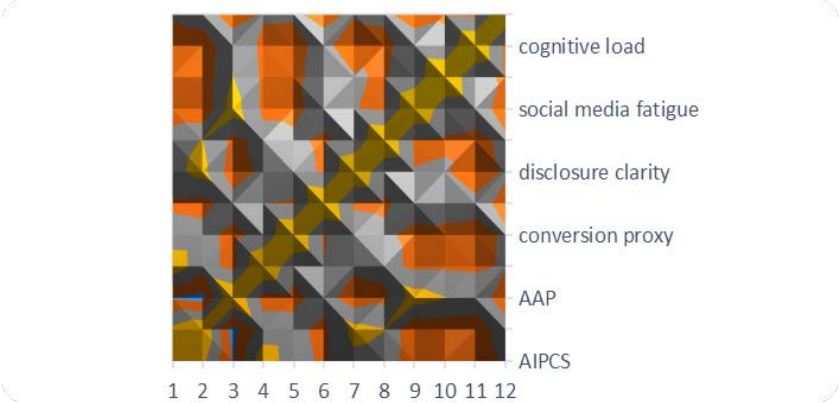


Source: proposed by the author.

Fig. 3. **Share of AI-assisted messages, %**

Source: proposed by the author.

Fig. 4. **Transparency of AI involvement disclosure and trust intention**



Source: proposed by the author.

Fig. 5. **Correlation matrix with a color scale**

Table 3

Parameters of the regression model of effectiveness

Parameter	Estimate	SE	t	p
const	42.887973	4.066511	10.546627	0.000000
trust_intent	0.145666	0.019097	7.627637	0.000000
disclosure_clarity	0.093593	0.019828	4.720198	0.000002
authenticity_cues	0.019218	0.025752	0.746281	0.455561
algorithmic_literacy	0.015119	0.025046	0.603663	0.546118
social_media_fatigue	-0.111365	0.026113	-4.265936	0.000020
privacy_concern	-0.083590	0.026892	-3.107788	0.001905
cognitive_load	-0.214299	0.028068	-7.635179	0.000000
gamification_intensity	0.034911	0.013001	2.685230	0.007294
diversity_balance	0.063593	0.014600	4.356421	0.000013

Source: proposed by the author.

The practical and theoretical value of the results consisted in proving the possibility of integrating psychological mechanisms of advertising influence into the project management system of military marketing digitalization through three types of controllable indicators: the predicted influence indicator AIPCS, the avoidance risk indicator AAP, and the managerial configuration quality indicator APGI. The scientific novelty consisted in substantiating the calibrated origin of index weights from data, which removed the typical reviewer's question regarding the arbitrariness of aggregation and ensured the interpretability of the indicators for the control points of digitalization projects. In summary, it was confirmed that the effectiveness of AI-assisted recruitment communications in military marketing depended on the managed balance of transparency, authenticity, and cognitive economy, rather than on the mere fact of using artificial intelligence as a content generation tool.

Conclusions and prospects for further research. The stated aim of the study was achieved by establishing a formalized relationship between the use of artificial intelligence in the project management system of military marketing digitalization and the psychological mechanisms of advertising influence that determined the manageability of the effectiveness of recruitment communications in digital channels. It was established that the contribution of artificial intelligence was manifested primarily in increasing the reproducibility of the persuasion effect through the standardization of message components, controlled disclosure of AI involvement, optimization of cognitive load, and reduction of the prerequisites for advertising avoidance caused by overload, social fatigue, and privacy concerns.

The sufficiency of the stratified corpus of public recruitment messages for robust assessment of the relationships between psychological variables and integrated indicators of project control was confirmed. It was found that the AIPCS indicator, defined in probabilistic form and scaled to the 0–100 interval,

reflected the predicted potential of effectiveness through the positive contribution of trust intention, transparency of AI involvement disclosure, authenticity cues, and representation balance, as well as the negative contribution of cognitive load, social fatigue, and privacy concerns. It was proven that the AAP indicator was a relevant indicator of the risk of active advertising avoidance in an algorithmic environment, since it increased with the strengthening of advertising overload, fatigue, privacy risks, and cognitive load, and decreased with higher algorithmic literacy and disclosure transparency. It was substantiated that the APGI managerial index ensured the integration of persuasion enhancers and avoidance-risk penalties within a single dimension, while its weights could be obtained through calibration from empirical data by normalizing standardized coefficients, which eliminated the arbitrariness of aggregation and increased the interpretability of the control points of digitalization projects.

Further research should be linked to the deepening of the validation of the proposed indicators in quasi-experimental designs, the verification of coefficient stability across different time windows and country contexts, as well as the extension of the model to immersive formats of recruitment communications using artificial intelligence and simulation technologies. Additionally, testing causal mediators between transparency of AI involvement, authenticity, and trust is promising, as is the development of project monitoring procedures that take into account the risks of cognitive influence and information security under the conditions of algorithmically managed environments.

Acknowledgments. None.

Funding. None.

Conflict of interest. None.

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HOW TO CITE THIS ARTICLE
Horodetskiy, Yu. (2026). artificial intelligence in the project management system for digitalization of military marketing: psychological mechanisms of advertising influence. *Management*, 1(43): 73–87. https://doi.org/10.30857/2415-3206.2026.1.7.

JEL Classification:
M31, M37, D91

UDC 339.138:165.82

DOI: 10.30857/2415-3206.2026.1.8

KAIROS MARKETING: THEORETICAL SUBSTANTIATION OF THE CONCEPTUAL MODEL OF TEMPORALLY ORIENTED COMMUNICATIVE INFLUENCE

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STATEMENT OF THE PROBLEM. The modern consumer operates under conditions of critical information overload. This leads to a progressive decline in the effectiveness of traditional communication models. There is an urgent need to move from quantitative reach strategies, based on the logic of Chronos, to strategies of qualitative identification of a favorable moment for establishing contact, based on the logic of Kairos. The theoretical and methodological basis of the work is an interdisciplinary synthesis of ancient Greek philosophy of time, neurocognitive research on the limited resources of conscious information processing by humans, the theory of emotional filters of perception, and the modern management methodology of Kairos management.

PURPOSE OF THE STUDY. The purpose of the work is to theoretically substantiate and develop in detail the authors' conceptual model of Kairos marketing as temporally oriented communicative influence under conditions of a turbulent environment.

MAIN HYPOTHESIS. The effectiveness of marketing communications increases significantly if, instead of traditionally responding to external user actions, priority is given to the user's internal psycho-temporal state and individual short-term windows of information perception are identified.

METHODS USED. The methodological basis of the study is an interdisciplinary synthesis of ancient Greek philosophy of time, neurocognitive research on the limited resources of conscious information processing by humans, the theory of emotional filters of perception, and the modern management methodology of Kairos management.

RESULTS. Within the study, four interrelated structural blocks of the model were scientifically substantiated and detailed. The first block – the "consumer temporal map" – makes it possible to reconstruct the temporal rhythms, life cycles, and typical activity patterns of the target audience. The second block – the "perception window" – identifies specific, often short-term intervals when the consumer's cognitive and emotional barriers are minimal, making the consumer open to external influence. The third block – the "Kairos message" – focuses on creating content whose structure and tone are adapted to the specific state of the subject at the moment of contact. The fourth block – the "temporal feedback loop" – provides a mechanism for the continuous adjustment of communication parameters based on analysis of the success of previous interactions.

SCIENTIFIC NOVELTY. The scientific novelty of the article consists in a clear categorical distinction between Kairos marketing and related approaches such as trigger marketing and contextual targeting. It is proven that, unlike traditional systems that respond to external user actions, Kairos marketing prioritizes the user's internal psycho-temporal state. The theoretical substantiation of the model expands the understanding of the adaptability of marketing systems and proposes a new analytical framework for studying communicative effectiveness in conditions of high environmental turbulence.

CONCLUSIONS. The proposed concept creates a new analytical framework for studying communicative effectiveness during high market turbulence. It has been established that the key directions for further research are the operationalization of the model through machine learning algorithms, as well as the study of the possibilities for its practical scaling in various sectors of modern business.

KEYWORDS: Kairos marketing; Kairos management; temporal marketing; perception window; emotional filter; marketing communications; communicative influence; bifurcation point; neurocognitive approach; neuromarketing; new marketing technologies.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
30	1	1

Received: 22.04.2026	Revised: 19.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification:
M31, M37, D91

УДК 339.138:165.82

DOI: 10.30857/2415-3206.2026.1.8

КАЙРОС-МАРКЕТИНГ: ТЕОРЕТИЧНЕ ОБҐРУНТУВАННЯ КОНЦЕПТУАЛЬНОЇ МОДЕЛІ ТЕМПОРАЛЬНО-ОРІЄНТОВАНОГО КОМУНІКАТИВНОГО ВПЛИВУ

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ПОСТАНОВКА ПРОБЛЕМИ. Сучасний споживач перебуває в умовах критичного інформаційного перевантаження. Це призводить до прогресуючого зниження ефективності традиційних моделей комунікації. Постає гостра потреба у переході від стратегій кількісного охоплення, заснованих на логіці Хроносу, до стратегій якісної ідентифікації сприятливого моменту для встановлення контакту, що базуються на логіці Кайросу. Теоретико-методологічний базис роботи становить міждисциплінарний синтез давньогрецької філософії часу, нейрокогнітивних досліджень щодо обмеженості ресурсів свідомої обробки інформації людиною, теорії емоційних фільтрів сприйняття та сучасної управлінської методики Кайрос-менеджменту.

МЕТА ДОСЛІДЖЕННЯ. Метою роботи є теоретичне обґрунтування та детальна розробка авторської концептуальної моделі Кайрос-маркетингу як темпорально-орієнтованого комунікативного впливу в умовах турбулентного середовища.

ОСНОВНА ГІПОТЕЗА. Ефективність маркетингових комунікацій суттєво зростає, якщо замість традиційного реагування на зовнішні дії користувача пріоритезувати його внутрішній психо-темпоральний стан та виявляти індивідуальні короткотривалі вікна сприйняття інформації.

ВИКОРИСТАНІ МЕТОДИ. Методологічний базис дослідження становить міждисциплінарний синтез давньогрецької філософії часу, нейрокогнітивних досліджень щодо обмеженості ресурсів свідомої обробки інформації людиною, теорії емоційних фільтрів сприйняття та сучасної управлінської методики Кайрос-менеджменту.

РЕЗУЛЬТАТИ. В межах дослідження науково обґрунтовано та деталізовано чотири взаємопов'язані структурні блоки моделі. Перший блок – «темпоральна карта споживача» – дозволяє реконструювати часові ритми, життєві цикли та типові патерни активності цільової аудиторії. Другий блок – «вікно сприйняття» – визначає специфічні, часто короткотривалі інтервали, коли когнітивні та емоційні бар'єри споживача є мінімальними, що робить його відкритим до зовнішнього впливу. Третій блок – «кайрос-повідомлення» – фокусується на створенні контенту, який за своєю структурою та тональністю адаптований до конкретного стану суб'єкта у момент контакту. Четвертий блок – «петля темпорального зворотного зв'язку» – забезпечує механізм постійної корекції комунікаційних параметрів на основі аналізу успішності попередніх взаємодій.

НАУКОВА НОВИЗНА статті полягає у чіткому категоріальному розмежуванні Кайрос-маркетингу від суміжних підходів, таких як тригерний маркетинг та контекстний таргетинг. Доведено, що на відміну від традиційних систем, які реагують на зовнішні дії користувача, Кайрос-маркетинг пріоритезує його внутрішній психо-темпоральний стан. Теоретичне обґрунтування моделі розширює розуміння адаптивності маркетингових систем та пропонує нову аналітичну рамку для вивчення комунікативної ефективності в умовах високої турбулентності середовища.

ВИСНОВКИ. Запропонована концепція створює нову аналітичну рамку для вивчення комунікативної ефективності під час високої турбулентності ринку. Встановлено, що ключовими напрямами подальших розвідок є операціоналізація моделі за допомогою алгоритмів машинного навчання, а також дослідження можливостей її практичного масштабування в різних галузях сучасного бізнесу.

КЛЮЧОВІ СЛОВА: Кайрос-маркетинг; Кайрос-менеджмент; темпоральний маркетинг; вікно сприйняття; емоційний фільтр; маркетингові комунікації; комунікативний вплив; точка біфуркації; нейрокогнітивний підхід; нейромаркетинг; нові марктингові технології.

Introduction. Modern marketing practice functions under conditions of unprecedented consumer information overload. The fragmentation of the media space, the proliferation of advertising channels, and increasing competition for attention lead to the fact that traditional models of marketing communications – based on the logic of reach and contact frequency – demonstrate a steady decline in effectiveness (Krakhmalova, 2025). The proposed responses to this challenge (targeted marketing, contextual advertising, trigger systems) address the questions of who and what, but largely leave aside the question of when exactly and in what internal state the contact between a communicative message and its recipient occurs.

Meanwhile, precisely these two parameters – temporal accuracy and the state of the subject – appear to be decisive for the effectiveness of communicative influence. This article is devoted to the theoretical substantiation of a conceptual model that offers a systematic response to the indicated gap. The model has been named "Kairos marketing" to denote a temporally oriented approach centered on identifying and using the "right moment" for marketing contact. It is part of the broader concept of the management methodology known as "Kairos management", which combines a system of methods aimed at identifying and practically applying favorable opportunities (Liadskyi, 2025). Understanding the temporal nature of human perception, represented in ancient Greek culture through the concept of Kairos, makes it possible to propose a new analytical framework that integrates philosophical, neurocognitive, and marketing dimensions (Gavrylechko, n.d.).

The issue of effective use of kairoi in management and marketing is actively studied by scholars from different countries, including I.K. Liadskyi (2025), I.V. Bohonko (2025), N.M. Volik (2025), N. Kononets and I. Ishchenko (2025), O.Yu. Kravchuk (2025), H.M. Meshko and O.I. Meshko (2026), Yu.M. Safonov, I.K. Liadskyi and M.V. Zos-Kior (2024), J.H. Austin (2003), C. Bazerman (1994), Bright I. Nwaru (2026), C. Busch (2024), R. Lopes, M.A.F. Rosendo and L. Wardil (2021), M. Maniadakis and P. Trahanias (2011), R.K. Merton and E. Barber (2004), J. Orvai and S. Gentil (2024), A. Pluchino, A.E. Biondo and A. Rapisarda (2019). Despite a substantial body of work in the field of marketing strategies, the potential of temporal flexibility as an instrument for strengthening the precision of communicative influence remains insufficiently studied. This is precisely the gap addressed by the concept of Kairos marketing, which opens new opportunities for overcoming barriers to information perception and strengthening the connection between the brand and the consumer. Reconsidering this methodology through the prism of communications emphasizes the importance of studying mechanisms for identifying the "right moment" as a key factor that ensures high relevance of the

marketing message and becomes a prerequisite for effective adaptation of enterprises to challenges and turbulent changes in the digital environment.

The purpose of the article is to provide a theoretical substantiation of the conceptual model of Kairos marketing through the synthesis of relevant research traditions: ancient philosophy of time, neurocognitive studies of information processing, and the theory of emotional filters.

The conceptual foundation of the proposed model is the ancient Greek distinction between two dimensions of time – Chronos and Kairos – which, despite its antiquity, reveals exceptional heuristic value for describing the dynamics of human decisions and reactions.

Chronos (Χρόνος) denotes time as a continuous, quantitatively measurable sequence: seconds that form hours, years, epochs. It is the time of structures, institutions, demographic waves, and technological paradigms. The French historian Fernand Braudel (1949) introduced the concept of longue durée – "long duration" (developed within the Annales school) – to denote this dimension, which moves so slowly that it seems immobile, but in fact is the most powerful driving force in the arsenal of social change.

Kairos (Καιρός) denotes time as a moment – a qualitatively special point in the flow of Chronos, in which the possibility of action is concentrated. The literal translation is "the right time", "the opportune moment". Unlike Chronos, which flows independently of the subject, Kairos constitutively requires a subject capable of recognizing and using the moment. In the Greek tradition, Kairos is inseparably connected with the concept of phronesis – practical wisdom, the ability for situational judgment (Aristotle, 1998). This two-dimensional temporal model is actively studied in domestic philosophical and marketing science (Gavrylechko, n.d.).

The mathematical analogue of Kairos in nonlinear dynamics is the bifurcation point: the moment when a system ceases to be deterministic and the slightest perturbation determines which path it will follow next. The Belgian physicist and Nobel laureate Ilya Prigogine (Prigogine & Stengers, 1984) showed that precisely near bifurcation points dissipative systems are capable of self-organization and abrupt complication – and this conclusion is structurally accurate for social systems as well, including the dynamics of consumer decisions.

For marketing, this distinction is of fundamental importance. Most existing approaches function in the logic of Chronos: they plan reach and contact frequency in calendar time without differentiating homogeneous moments of the flow. Kairos marketing proposes shifting the focus to identifying qualitatively different points in the consumer’s temporal structure.

The second theoretical source of the proposed model is neurocognitive research into the bandwidth of human consciousness. The key fact here is the

striking gap between the amount of information entering through the sensory organs and the possibilities of conscious processing.

According to estimates that vary depending on the measurement methodology, from 10 to 11 million bits per second enter the human brain through the sensory organs (Norretranders, 1998; Zimmermann, 1986). By contrast, the bandwidth of conscious attention is estimated in the range of 30–60 bits per second and below (Davidson, Scherer & Goldsmith, 2003; Felton, 2024). Thus, the difference between the incoming flow and conscious processing ranges from four to six orders of magnitude. Domestic studies in behavioral finance and marketing confirm that this cognitive limitation directly affects the effectiveness of communication strategies (Nikiforov & Marych, 2022).

From this follows a fundamentally important conclusion for marketing: a larger volume of marketing messages does not increase the probability of their assimilation; on the contrary, it intensifies competition for the limited resource of conscious attention and, accordingly, increases the importance of the precision of the moment and the state of the consumer at the moment of contact.

The third theoretical source is research into the role of emotions in filtering and prioritizing incoming information. The mechanism of the emotional filter is central to selecting, among millions of incoming bits, those that will receive priority in conscious processing.

Neurobiologically, this mechanism is associated with the activity of the amygdala – a structure that performs a rapid (pre-cortical) assessment of the emotional significance of an incoming signal before it reaches the cerebral cortex (LeDoux, 1996). Signals that receive a high emotional evaluation pass through the filter with priority and form the focus of conscious attention. Research in behavioral economics, including studies conducted in Ukrainian academic institutions, confirms the correlation between emotional context and the quality of consumer decisions (Spivakovska, Spivakovskyi & Tsarova, 2025).

However, it is fundamentally important that the emotional filter itself is not constant: its sensitivity and configuration change depending on the current internal state of the subject. Studies in affective neuroscience, which examines the neural mechanisms of emotions, feelings, mood, and motivational states (Davidson, Scherer & Goldsmith, 2003), and behavioral economics (Loewenstein & Lerner, 2003) indicate that the same external stimuli are perceived and processed in fundamentally different ways depending on the emotional context in which the subject is at the moment of contact. This variability of the filter is the basis for the key concept of Kairos marketing – the perception window: a state of the subject in which the emotional filter demonstrates increased openness to a certain type of message.

Materials and methods. The methodological basis of the study is a complex of general scientific and special methods of theoretical inquiry aimed at developing and substantiating the conceptual model of Kairos marketing. The work is based on a systems approach, which makes it possible to view marketing communication as a dynamic process whose effectiveness depends on the interaction of temporal, cognitive, and contextual factors.

To achieve the purpose of the study, the following methods were used:

1. The method of interdisciplinary synthesis was applied to integrate the concepts of ancient Greek philosophy (the "Chronos–Kairos" dichotomy), the provisions of neuromarketing concerning the limited nature of cognitive resources, and modern management methodologies of Kairos management into a single analytical framework.

2. Theoretical analysis and generalization were used for a critical review of existing models of marketing communications (targeted, contextual, and trigger marketing) and for identifying their limitations in matters of temporal precision of influence.

3. Comparative analysis was applied to distinguish the categorical apparatus of Kairos marketing from traditional approaches, which made it possible to identify the specific characteristics of the "right moment" of communication.

4. The method of conceptual modeling became the main instrument for the architectonics of the proposed model, which made it possible to structure it as four interrelated blocks: the consumer temporal map, the perception window, the Kairos message, and the feedback loop.

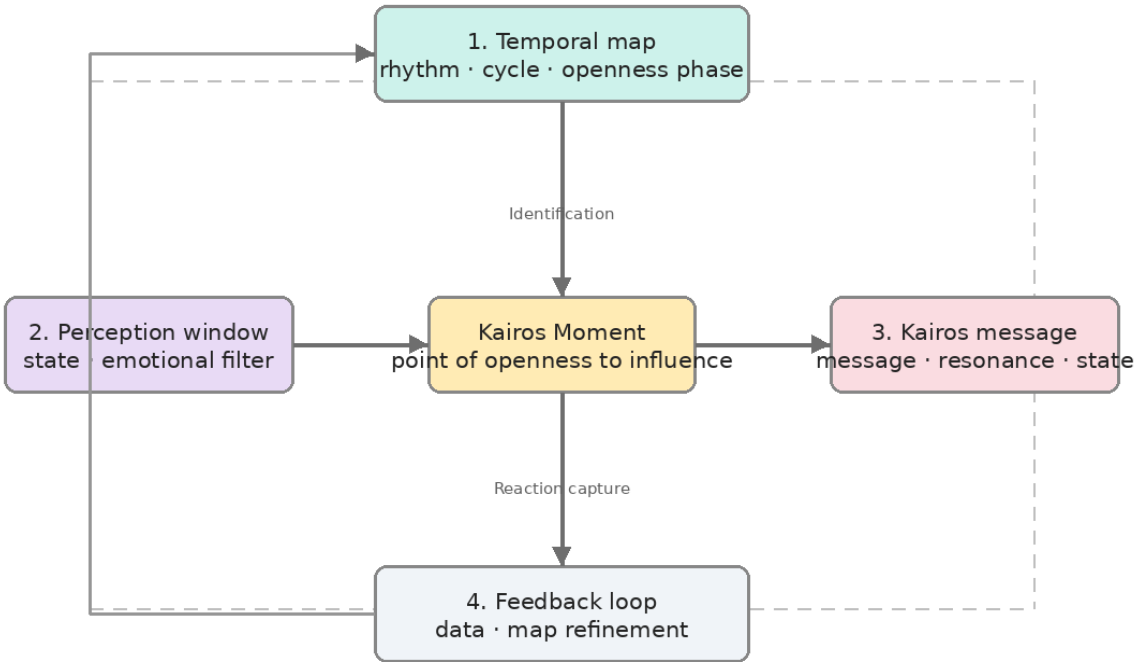
The research materials were scientific works by domestic and foreign specialists in marketing, cognitive psychology, and management, as well as analytical reports on the effectiveness of digital communications under conditions of information overload.

Results and discussion. Based on the three outlined theoretical sources, a conceptual model of Kairos marketing is proposed, consisting of four structural blocks united into a closed temporal cycle (Fig. 1).

Kairos in the ancient Greek understanding is always situational: it does not arise from nothing, but from matured conditions of Chronos. Accordingly, the first structural block of the model is the construction of the consumer temporal map – a systemic representation of the rhythms, cycles, and points of increased openness that characterize a specific consumer segment (Gavrylechko, n.d.; Krakhmalova, 2025).

The temporal map is three-dimensional: it combines (1) the chronological dimension – objectively measurable time (day, week, quarter, year); (2) the contextual dimension – circumstances that typically accompany certain chronological points (completion of a project, the beginning of a new academic

year, the end of a financial quarter); and (3) the emotional dimension – states typical of specific contextual configurations.



Source: developed by the authors.

Fig. 1. **Conceptual model of Kairos Marketing**

Thus, the temporal map is a qualitatively richer construct than the traditional "optimal posting time". It does not answer the question "when the consumer is online", but rather answers the question "when the consumer is in a state open to making decisions of a certain type".

The central concept of the model is the perception window – a theoretical construct denoting the state of the subject in which the emotional filter demonstrates increased permeability to a marketing message of a certain type.

The perception window differs fundamentally from related concepts. Unlike the target audience (a socio-demographic characteristic), the window is temporally and statially variable: the same person may be in the perception window for some types of messages and closed to others depending on the current state. Unlike a behavioral trigger (a recorded event in the digital environment), the window is an internal state that may not have an obvious external behavioral correlate.

From the standpoint of the theory of emotional filters, in an open perception window: (a) the threshold value for a signal to pass through the filter decreases; (b) the depth of processing of the accepted signal increases; (c) the probability of forming and preserving an intention increases. In a closed window, however, increasing the quantity or intensity of signals does not increase, but reduces effectiveness: increased noise activates defense

mechanisms (Nikiforov & Marych, 2022; Spivakovska, Spivakovskyi & Tsarova, 2025).

The third block defines the specific characteristics of a marketing message optimized to function within the logic of Kairos marketing. A Kairos message differs from a standard advertising message in three parameters:

1) Minimality. Given the physiological limitation of conscious processing (30–60 bits/s), an effective message must be capable of activating the necessary reaction with minimal cognitive load. This is not a statement about the desirability of "simplicity" in the aesthetic sense, but about structural necessity: a message that requires prolonged conscious processing competes with thousands of other signals and loses this competition regardless of the quality of its content.

2) Resonance with the current state. A standard advertising message appeals to the target attributes of a product or service. A Kairos message appeals to the current state of the subject and offers a connection between this state and the product not as a logical argument, but as direct emotional reflection. This is a fundamentally different structure: not "here are the advantages of our product", but "you are now precisely at the point where this resource becomes relevant".

3) Distinctness from manipulation. It is necessary to clearly distinguish Kairos marketing from emotional manipulation. Manipulation creates an artificial emotional state in order to bypass the subject’s rational filter. Kairos marketing identifies an existing state and offers a message that resonates with it, without distorting or artificially intensifying that state. The first approach produces short-term conversion at the expense of trust; the second builds a sustainable communicative connection based on genuine relevance (Spivakovska, Spivakovskyi & Tsarova, 2025).

The fourth block transforms the model from a linear algorithm into a learning system. Each contact with the audience generates temporally annotated data – not only about who reacted and how, but also when and under what circumstances. These data make it possible to refine the temporal map and increase the accuracy of identifying perception windows in subsequent cycles.

Thus, Kairos marketing acquires the characteristics of an adaptive system: the initial temporal map is an a priori hypothesis that is refined on the basis of empirical data from interaction with a specific segment. This brings marketing communication closer to the structure of scientific cognition: hypothesis generation – verification – refinement – new hypothesis.

To determine the categorical status of Kairos marketing, it is necessary to clearly define its differences from the closest related approaches – trigger marketing and contextual targeting (Table 1).

Trigger marketing identifies the moment of contact on the basis of a recorded behavioral event (page visit, abandoned cart, subscription expiration).

The trigger moment is external and post-hoc ("after the event"): the system reacts to what has already occurred. Kairos is internal and may precede any measurable behavior or may have no obvious behavioral correlate at all.

Table 1

Comparative characteristics of Kairos marketing and related approaches

Criterion	Trigger Marketing	Contextual Targeting	Kairos Marketing
Unit of analysis	Behavioral event	External context	Internal state of the subject
Temporal logic	Post-hoc (after the event)	Chronos (flow)	Kairos (moment)
Role of emotions	Reaction trigger	Not considered	Identifier of the perception window
Key metric	Conversion after trigger	Reach × relevance	Accuracy of temporal match
Influence model	Reactive	Translational	Resonant

Source: developed by the authors.

Contextual targeting takes into account the external circumstances of contact (content topic, geolocation, device, time of day). It functions in the logic of Chronos: the context describes where and when in objectively measurable time, but does not describe the internal state of the subject at that moment. The same person may read financial news in a state of anxious searching or in a state of calm awareness – under identical external context.

Emotional marketing, as a rule, seeks to create or intensify an emotion through the message. Kairos marketing proceeds from the opposite direction: first it identifies an existing state, then forms a message that resonates with it. This distinction is not only technical, but also ethical.

The proposed model has conceptual status: it defines the theoretical framework and key constructs, while leaving open a number of questions that require further development.

Operationalization of the perception window. The central concept of the model – the perception window as an internal state of the subject – currently has no generally accepted method of measurement. Further research must determine: (a) which indirect behavioral or physiological indicators may serve as proxies for identifying the window; (b) how openness/closedness of the window can be measured without invasive monitoring of the subject; (c) how stable the temporal map of windows is for different segments.

Scalability of the model. Kairos in its classical philosophical concept is deeply individual and situational. Transferring this construct to the level of mass marketing involves the risk of excessive simplification through averaging. It is

necessary to develop a methodology that would make it possible to identify temporal regularities at the segment level without reducing individual variability to statistical noise.

The effectiveness of the conceptual model of Kairos marketing is fully revealed only when the proposed instruments become the foundation for deep systemic transformations in a company's communication policy. Implementation of this methodology requires complex changes at three interrelated levels – from the psychocognitive adjustment of specialists to the formation of new value paradigms in global strategies of interaction with the consumer.

I. At the individual-cognitive level, the key aspect is the development of marketers' ability to concentrate attention on identifying latent consumer needs, switching in a timely manner between algorithmic and empathic modes of thinking. The implementation of neuromarketing analysis practices helps to "cut off" excessive informational noise and increase brand sensitivity to subtle changes in the recipient's state. This creates conditions for the transition from mechanical message distribution to the formation of "sniper" precision of contact, where the conscious presence of the brand in the client's life becomes the basis of genuine communicative effectiveness.

II. At the organizational-managerial level, implementation of the Kairos marketing model requires transformation of the company's internal culture toward horizontal interaction and flexibility. Traditional rigid media plans and pre-approved publication schedules give way to a dynamic environment in which line managers receive the authority to initiate changes and adapt communication in real time. The organization must become a "sensitive organism" capable of instantly responding to the emergence of bifurcation points and windows of opportunity, making strategically important decisions under conditions of high market uncertainty.

III. At the strategic-global level, there is a fundamental rethinking of the very nature of marketing influence – from aggressive "conveyor-belt" imposition of goods to the formation of ecosystem interaction with the consumer. In this paradigm, the brand focuses on creating value precisely at the moment when the consumer needs it most and is ready to perceive it. Kairos marketing is transformed from a set of individual techniques into the foundation of a new marketing paradigm, where success is determined not by the scale of the advertising budget, but by the ability of the business to fit harmoniously into the temporal rhythm of human life, becoming not an irritant, but a timely solution.

Operational definition of the boundary between resonance and manipulation. The theoretical distinction between resonance (reflection of an existing state) and manipulation (artificial creation of a state) requires

operational definition. A criteria-based apparatus is needed that would allow specific marketing techniques to be classified on one or the other side of this boundary.

Empirical verification. The proposed model is a theoretical construct that requires empirical testing. Promising directions include: quasi-experimental studies of message effectiveness under different temporal conditions; longitudinal studies of consumer temporal maps in different categories; and field tests of operational hypotheses arising from the model.

Conclusions. The article proposes and theoretically substantiates a conceptual model of Kairos marketing – a temporally oriented approach to marketing communications that synthesizes three research traditions: ancient philosophy of two-dimensional time, neurocognitive studies of the limited nature of conscious information processing, and the theory of emotional filters.

The model consists of four structural blocks: the consumer temporal map, the perception window, the Kairos message, and the temporal feedback loop. The visual representation of the model (Fig. 1) demonstrates the closed nature of these blocks: the direct flow (identification → window opening → activation → reaction capture) is supplemented by a learning loop that ensures continuous refinement of the temporal map.

The categorical differences between Kairos marketing and trigger marketing, contextual targeting, and emotional marketing have been identified. The key theoretical contribution of the work lies in introducing the construct of the perception window as an analytical unit that makes it possible to conceptually capture the temporally variable openness of the subject to marketing influence. This construct forms a theoretical bridge between the two-dimensional model of time and the operational tasks of marketing communications.

Prospects for further research are related to the operationalization of the central concepts of the model, the development of methodological tools for identifying perception windows, and empirical verification of the main hypotheses arising from the model. Research on Kairos marketing in the context of the Ukrainian market has particular potential, where the specificity of crisis and wartime conditions forms fundamentally new temporal maps of consumers.

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HOW TO CITE THIS ARTICLE
Gavrylechko, Yu. & Liadskyi. I. (2026). Kairos marketing: theoretical substantiation of the conceptual model of temporally oriented communicative influence. *Management*, 1(43): 88–101. https://doi.org/10.30857/2415-3206.2026.1.8.

JEL Classification: O32

UDC 334.012:338.24

DOI: 10.30857/2415-3206.2026.1.9

SUBSTANTIATION OF THE PROGRAM DEVELOPMENT OF INTEGRATED STRUCTURES OF COMBINED ENTERPRISES

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INTRODUCTION. The insufficient development of conceptual principles regarding integrated structures of combined enterprises, their development on the basis of a program-target approach, necessitates the search for theoretical foundations based on the principles of convergence inherent in self-organizing structures that reproduce the effects of interaction and interconnections of business entities.

THE HYPOTHESIS OF THE SCIENTIFIC RESEARCH is to substantiate recommendations and proposals for the development of integrated structures on the basis of a program-target approach as one of the priorities in the conditions of martial law and post-war restoration of the state economy.

The purpose of the study is to substantiate the features of the program development of integrated structures in modern conditions.

THE METHODOLOGY OF SCIENTIFIC RESEARCH is general scientific research methods: system-structural method, methods of induction, deduction and logical generalizations – in establishing the factors of formation and identifying classification features of integrated structures, in clarifying the features and principles of development and substantiation of program development of integrated structures of joint enterprises; methods of abstract-logical and system analysis – in identifying laws and patterns of formation of integrated structures.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH. The program-target aspect of the development of integrated structures of joint enterprises requires the formation of new approaches to effective management, which are based on the paradigm of interorganizational management. The task of such management is to achieve organizational efficiency and effectiveness by coordinating and program development of available resources within the integrated structures of joint enterprises.

KEYWORDS: efficiency; economic and organizational support; integrated structures; innovations; management; program development; joint enterprises; synergy.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
10	0	0

Received: 29.04.2026	Revised: 20.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: O32

УДК 334.012:338.24

DOI: 10.30857/2415-3206.2026.1.9

ОБҐРУНТУВАННЯ ПРОГРАМНОГО РОЗВИТКУ ІНТЕГРОВАНИХ СТРУКТУР ОБ'ЄДНАНИХ ПІДПРИЄМСТВ

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ВСТУП. Недостатня розвиненість концептуальних засад щодо інтегрованих структур об'єднаних підприємств, їх розвитку на засадах програмно-цільового підходу, зумовлює пошук теоретичних основ, заснованих на принципах конвергентності, властивих самоорганізуючим структурам, що відтворюють ефекти взаємодії та взаємозв'язків суб'єктів господарювання.

ГІПОТЕЗА НАУКОВОГО ДОСЛІДЖЕННЯ полягає у обґрунтуванні рекомендацій та пропозицій щодо розвитку інтегрованих структур на основі програмно-цільового підходу як одного із пріоритетних в умовах воєнного стану та післявоєнного відновлення економіки держави.

МЕТОЮ ДОСЛІДЖЕННЯ є обґрунтування особливостей програмного розвитку інтегрованих структур в сучасних умовах.

МЕТОДОЛОГІЄЮ НАУКОВОГО ДОСЛІДЖЕННЯ є загальнонаукові методи дослідження: системно-структурний метод, методи індукції, дедукції та логічних узагальнень – у встановленні факторів формування та виявленні класифікаційних ознак інтегрованих структур, у з'ясуванні особливостей і принципів розробки та обґрунтування програмного розвитку інтегрованих структур об'єднаних підприємств; методи абстрактно-логічного та системного аналізу – у виявленні законів і закономірностей формування інтегрованих структур.

ВИСНОВКИ ТА ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ. Програмно-цільовий аспект розвитку інтегрованих структур об'єднаних підприємств потребує формування нових підходів щодо ефективного управління, які базуються на парадигмі міжорганізаційного управління. Завданням такого управління є досягнення організаційної ефективності та результативності шляхом узгодження та програмного розвитку наявних ресурсів в межах інтегрованих структур об'єднаних підприємств.

КЛЮЧОВІ СЛОВА: ефективність; економічно-організаційне забезпечення; інтегровані структури; інновації; управління; програмний розвиток; об'єднані підприємства; синергія.

Problem statement. Innovative development of integrated structures of joint ventures based on the development of targeted complex programs involves solving a list of theoretical, methodological and organizational issues. In software development, an urgent problem is the improvement of the system of planned indicators.

Analysis of recent research on the problem. The theoretical basis for studying the formation and functioning of integration structures was the work of the classics of economic science: A. Weber, K. Arrow, R. Coase, A. Marshall, S. North, S. Rosenfeld, E. Polymer, D. Sollier, J. Tyrol, O. Williamson, G. Haken, E. Chamberlin, J. Schumpeter, and others. The scientific achievements of the aforementioned specialists, as well as domestic scientists, collectively made a significant contribution to the formation of the program development of integrated structures.

The purpose of the study scientific substantiation of theoretical and methodological approaches to the program development of integrated structures of joint ventures.

Presentation of the main material. Program development is a rather complex process. At the same time, programs are subject to certain requirements, compliance with which increases the likelihood of success in their implementation.

The following are recognized as the main requirements for program development:

1) relevance of the program The program should be oriented towards solving the most pressing problems;

2) balance. The program should track the linking of all interacting resources and constraints;

3) focus. Program actions should meet the specified goals;

4) realism. Program implementation capabilities should be adequate;

5) controllability. Programs should be designed in such a way that there are no obstacles to analysis and control over the process of their implementation (Yermoshenko & Hanushchak-Iefimenko, 2010; Zhyhalkevych, 2019a).

For software development, a more developed feedback mechanism is used, which provides not only system adjustment, but also adjustment of the program itself in the interests of achieving the goal by adapting to changing external and internal factors. The main criterion when using the program-target method is the goal, not the plan. The presence of such feedback provides flexibility of management. Deviation from the state specified by the plan involves adjusting the behavior of the system, as well as changing the plan. The feedback mechanism not only provides fixation of internal and external changes of integrated structures and formation of corresponding actions and processes, but

also involves constant analysis of circumstances that contribute to the creation of changes (Zhyhalkevych, 2014; 2019a; 2019b).

Although long-term development programs open up space for adaptation when justifying the final target indicators, at the same time uncertainty factors increase. The tasks of the program development indicator system are to specify the goal, determine the final results in long-term plans. Therefore, program development helps to concentrate resource capabilities in solving the problems and tasks.

The system of program development goals is determined based on existing problems, on the one hand, and the presence of resource constraints – on the other. Thus, the program development methodology involves justifying goals based on their timeliness and the availability of resource capabilities (Ansoff, 1965; Baiura, 2009; Solntsev & Zhyhalkevych, 2020).

Under the program development of integrated structures of joint ventures, a planned complex of socio-economic, production, scientific and research, organizational activities is defined, which are oriented towards the production of innovative and technologically competitive products. The general main goal of program development consists of a list of sub-goals to meet the needs for individual types of innovative products. All sub-goals are interconnected with each other and the general goal, which is due to the need for comprehensive use of the infrastructure of the integrated structure and the interchangeability of various types of resources within it. The program development of integrated structures is considered as a sequential transformation of goals into measures and tasks. In practice, several technological options for implementing the target system are provided. Therefore, a convenient tool for presenting the program is a program tree of goals, which allows you to structure goals into measures and tasks according to their achievement. It is quite clear that the boundaries of the transition from measures to tasks and from tasks to resources are quite conditional, they are determined by the capabilities and goals set. At the same time, the possibilities of providing tasks with resources depend on their availability. According to alternative options, the program development of integrated structures should be carried out with an assessment of the available resources necessary for its implementation.

In the process of substantiating the program development of integrated structures, the method of expert assessments can be used. Within each integrated structure, it is considered necessary to create a coordination center that will coordinate the actions of their participants, as well as engage in the development and implementation of promising development projects. A group of experts will select the most appropriate option for the program development of integrated structures.

Based on the study of professional literature, a model of an abbreviated version of the program tree for the development of an integration structure is proposed, which includes several interconnected levels: subprograms, activities and tasks (Zhyhalkevych, 2014; 2019a). Activities are of an applied nature, which allows you to move from functional and subject needs to specific tasks and the necessary resources for their implementation. A feature of the program tree of goals is its practical orientation towards increasing the efficiency of integrated structures.

The first-level subprogram is focused on the formation of the component-functional structure of the integrated structure. It is specified in two subprograms:

1) restoration of production and technological connections;

2) structural and functional arrangement of participants.

Each of the blocks includes a group of related industries and institutions. Thus, the implementation of the first subprogram is possible when solving tasks related to improving the effective operation of structural units of each block of the integrated structure:

1) basic, which includes primary production;

2) related, which consists of the production of raw materials and materials, as well as energy support;

3) auxiliary – it consists of research organizations; marketing companies; consulting firms; institutions for training and retraining of personnel;

4) service – it includes trade and logistics companies; financial and investment institutions; service centers.

Program development measures for integrated structures are designed to ensure the achievement of the goals set in the tasks and include a list of specific types of production work, improving the quality of products in auxiliary industries, rational use of services of organizations, and improving information relations with service institutions (Zhyhalkevych, 2019b; Kreidych, Roshchyna & Kantsedal, 2019; Perevozova, Derhachova & Minakova, 2020).

A characteristic feature of the program tree of goals is that the subroutines of the first level can be executed only when implementing the subroutines of the second level, related to the modeling of the integrated structure. The model is used as a conditional one formed to simplify the study. On the basis of the system-structural approach, the structure of the system is organized – the organization of connections and relations between its subsystems and elements, as well as the composition of these subsystems and elements, each of which usually corresponds to a certain function (Zhyhalkevych, 2019a; Kreidych, Roshchyna & Kantsedal, 2019).

In the subprogram for modeling the integrated structure of joint ventures, five subsystems are distinguished:

1. The management and marketing subsystem, which receives information about the state of the market and other subsystems of the integrated structure, processes information, and forms tasks regarding the development directions of the components and the structure as a whole.

2. The central production subsystem, which is a set and production-economic or production-technological unity of the corresponding subsystems. This subsystem is the production core of any production.

3. The subsystem of production, corresponding to the types of production resources.

4. The subsystem of scientific and educational institutions: design and development institutes, bureaus, research institutions engaged in the study and implementation of technological and product innovations, educational institutions that train specialists of higher and secondary qualifications, technicians.

5. The subsystem of the service sector, which includes servicing enterprises, organizing sales and supply, financial services, etc.

In the following subprogram of forming program indicators, the task is to divide them into: target, development, resource, parametric, economic efficiency and competitive advantages. Each of the specified subprograms of the second level is focused on determining such parameters and their achievement. The study and identification of which requires in-depth research.

Thus, the specified subprograms reflect the main directions of improving the architecture of integrated structures based on innovative development. The simultaneous development of fundamental scientific problems and the solution of applied technical issues, including the implementation of existing developments, are provided. Therefore, such and other issues must also be resolved in the process of developing integrated structures.

The system of indicators of program development is based on the initial methodological principles:

- compliance of the system of indicators, program tasks with the general directions of development of the integrated structure, which characterizes the expediency of solving problems with the help of indicators, their economic orientation;
- orientation of the system of indicators on the maximum, effective use of all types of resources, increasing production efficiency, achieving final results with the lowest costs, which confirms the focus of the indicators on a comprehensive increase in the efficiency of social efforts, improving reproduction proportions;
- ensuring comparability of target indicators with planned ones, which allows linking target tasks and measures for participants, strengthening internal and external ties, increasing the efficiency of activities;

- taking into account the specifics of the problems being solved depending on the target orientation, which ensures the targeting and specificity of the final results, their wide application in practice;
- methodological unity of the development of planned indicators, their comparability with indicators used in statistics, which link the tasks and measures of the target program with economic system indicators (Kreidych, Roshchyna & Kantsedal, 2019; Perevozova, Derhachova & Minakova, 2020).

Building a system of indicators based on the above principles will ensure a single orientation of the participants of the integrated structure to solving the tasks set, increase their social and individual efficiency, improve production and economic relations.

The achievement of the planned final results should be ensured, first of all, by the necessary resources in the specified nomenclature and volumes. Therefore, among the indicators of resource availability of the complex, one can distinguish such as the volumes of fixed production and working capital, labor resources, capital investments. They reflect not only the initial conditions for the functioning of the integration structure, but also the features of its prospective development.

Parametric parameters of the integrated structure include market indicators and growth rates of participating enterprises. That is, a reflection of the process of activity of the integrated structure with input and output indicators. With the help of these indicators, a general assessment of the effectiveness of the functioning and development of the participants of the integrated structure is carried out, and it also becomes possible to regulate production and economic proportions in a planned manner – indicators of economic efficiency. Unlike natural target indicators, they reflect the effectiveness of the development of the structure, and the economical use of resources (Zhyhalkevych, 2014).

Conclusions and results of the study. Efficiency is the most important characteristic of the feasibility of integrating participants in joint ventures.

An effective system of economic diagnostics, built into the structure of corporate management, will contribute to the development and improvement of participants in corporate relations.

The parameters of economic efficiency of integrated structures will be indicators of the effectiveness of the joint activities of participants as a single whole, which is determined by the ratio of the sum of individual effects to the costs that led to their acquisition. They can be divided into internal and external. Internal ones relate to participants in the integrated structure. Such indicators include profitability, profitability, etc. External ones can be measured at the macro level: increasing the investment attractiveness of participants; creating new jobs; impact on the market segment (field of activity); penetration of new markets.

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HOW TO CITE THIS ARTICLE
Baula, O. (2026). Substantiation of the program development of integrated structures of combined enterprises. *Management*, 1(43): 102–110. https://doi.org/10.30857/2415-3206.2026.1.9.

JEL Classification: O32

UDC 334.722

DOI: 10.30857/2415-3206.2026.1.10

MODELING THE INNOVATIVE DEVELOPMENT OF BUSINESS STRUCTURES IN THE CONDITIONS OF POST-WAR ECONOMIC RECOVERY

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INTRODUCTION. Modeling the innovative development of business structures in the conditions of post-war economic recovery is the process of developing and applying economic, mathematical, organizational and digital models to substantiate management decisions regarding the recovery, modernization and sustainable development of enterprises after the end of hostilities. The main goal of such modeling is to ensure the rapid adaptation of business to new economic conditions, increase its competitiveness, innovative activity and resilience to future crises.

In the conditions of post-war recovery, the innovative development of business structures acquires particular importance, since the recovery of the economy requires not only the reconstruction of production facilities, but also the transition to innovation, digital transformation, development of human capital and integration into international production and logistics chains. These aspects reflect the importance of the innovative development of business structures in the conditions of post-war economic recovery of the state.

THE HYPOTHESIS OF THE SCIENTIFIC RESEARCH is to study the process of innovative development of business structures, namely the use of multidimensional comparative analysis, which allows taking into account not only the absolute values of business structure indicators, but also the degree of their proximity (distance) to the benchmark indicators.

THE PURPOSE OF THE RESEARCH: to assess the innovative potential; to identify factors that influence innovative development; to predict the results of the implementation of innovations.

THE RESEARCH METHODOLOGY is based on the use of scientific methods of econometric modeling to predict innovative activity; system dynamics to analyze the relationships between development factors; cluster modeling to study various development scenarios.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH. Modeling the innovative development of business structures is the process of creating and using models to analyze, predict and manage the implementation of innovations in the activities of business structures in order to increase their competitiveness and long-term development.

KEYWORDS: business structures; innovation efficiency; innovation process; clustering; modeling.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
12	7	3

Received: 29.04.2026	Revised: 21.05.2026	Accepted: 29.05.2026	Published: 01.06.2026

JEL Classification: O32

УДК 334.722

DOI: 10.30857/2415-3206.2026.1.10

МОДЕЛЮВАННЯ ІННОВАЦІЙНОГО РОЗВИТКУ БІЗНЕС-СТРУКТУР В УМОВАХ ПІСЛЯВОЄННОГО ВІДНОВЛЕННЯ ЕКОНОМІКИ

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ВСТУП. Моделювання інноваційного розвитку бізнес-структур в умовах повоєнного відновлення – це процес розроблення та застосування економічних, математичних, організаційних і цифрових моделей для обґрунтування управлінських рішень щодо відновлення, модернізації та сталого розвитку підприємств після завершення воєнних дій. Основною метою такого моделювання є забезпечення швидкої адаптації бізнесу до нових економічних умов, підвищення його конкурентоспроможності, інноваційної активності та стійкості до майбутніх криз.

В умовах повоєнного відновлення інноваційний розвиток бізнес-структур набуває особливого значення, оскільки відновлення економіки потребує не лише реконструкції виробничих потужностей, а й переходу до сучасних технологій, цифрової трансформації, розвитку людського капіталу та інтеграції у міжнародні виробничі й логістичні ланцюги. Ці аспекти відображають важливість інноваційного розвитку бізнес-структур в умовах післявоєнного відновлення економіки держави.

ГІПОТЕЗА НАУКОВОГО ДОСЛІДЖЕННЯ полягає в дослідженні процесу інноваційного розвитку бізнес-структур, а саме використання багатовимірного порівняльного аналізу, який враховує не тільки абсолютні величини показників бізнес-структур, але і ступінь їхньої близькості (дальності) до показників еталона.

МЕТА ДОСЛІДЖЕННЯ: оцінити інноваційний потенціал; визначити фактори, що впливають на інноваційний розвиток; спрогнозувати результати впровадження інновацій.

МЕТОДОЛОГІЯ ДОСЛІДЖЕННЯ базується на використанні наукових методів економетричного моделювання для прогнозування інноваційної активності; системної динаміки для аналізу взаємозв'язків між факторами розвитку; кластерне моделювання для дослідження різних сценаріїв розвитку.

ВИСНОВКИ ТА ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ. Моделювання інноваційного розвитку бізнес-структур – це процес створення та використання моделей для аналізу, прогнозування та управління впровадженням інновацій у діяльності бізнес-структур з метою підвищення їхньої конкурентоспроможності та довгострокового розвитку.

КЛЮЧОВІ СЛОВА: бізнес-структури; ефективність інновації; інноваційний процес; кластеризація; моделювання.

Problem statement. In modeling the innovative development of business structures, it is necessary to consider this process as the basis for technology transfer and the environment of merged enterprises, thanks to which it becomes possible to adapt merged enterprises to external changes.

Modeling stages:

- Setting the goal and defining the problem.
- Selecting factors and indicators.
- Building a simulation model.
- Checking the adequacy of the model.
- Conducting scenario analysis.
- Making management decisions and monitoring results.

Analysis of scientific literary sources. Problem statement In modeling the innovative development of business structures, it is necessary to consider this process as the basis for technology transfer and the environment of merged enterprises, thanks to which it becomes possible to adapt merged enterprises to external changes.

Modeling stages:

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- Building a simulation model.
- Checking the adequacy of the model.
- Conducting scenario analysis.
- Making management decisions and monitoring results.

The purpose of the article is to model the innovative development of business structures in the conditions of post-war economic recovery.

Presentation of the main material. The developed model is based on the availability of innovative opportunities in the conditions of post-war economic recovery and the achievement of strategic goals of business structures and their ability to adapt to environmental changes. The relationships between the components of the model are reflected in various forms. Closed innovation models correspond to the positioning of business structures as a violator; for a stakeholder, the use of such a model is complicated due to the fact that its goal is to coordinate innovation processes; for an explent – practically impossible, since such business structures involve licensing innovation objects to third-party enterprises).

The possibility of implementation this proposed model depend on its compliance with internal features – resources, processes and potential of the enterprise: resources; innovative potential.

Based on the analysis of strategic innovative decisions of business structures, it is shown that from the point of view of the relationships and mutual influence of traditional and innovative elements of structures, there are

differences between the types of models for each of the three identified classes of business structures, which is largely determined by the features of innovation, which in turn allows the analyzed entities to take into account and use innovative technologies from know-how markets.

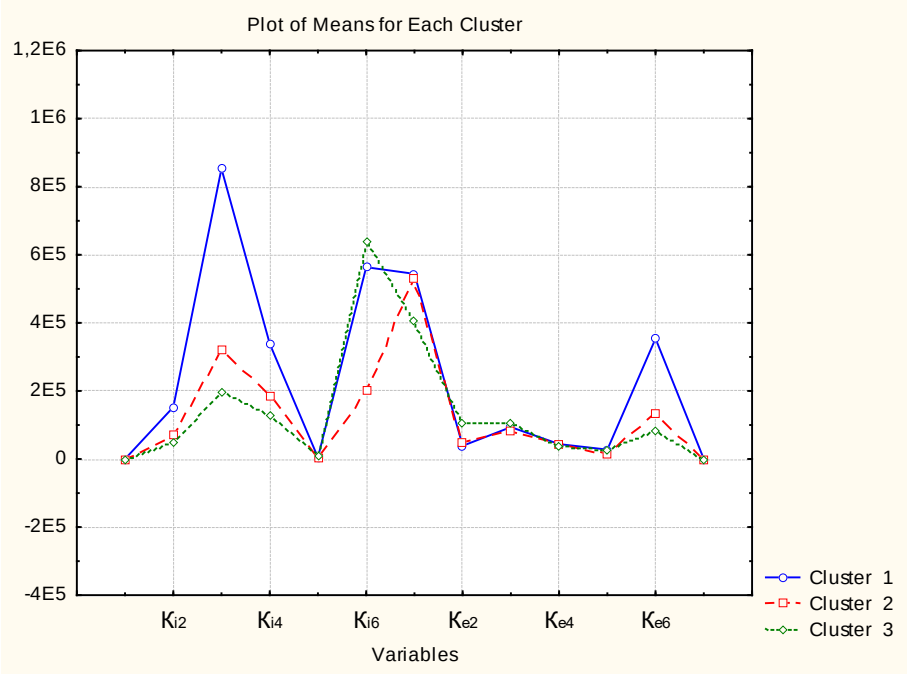
To typify the studied enterprises on the basis of the "Possibility of attracting / providing innovations", their clustering was carried out using the STATISTIKA7 application program package, the list of grouping indicators is given in Table 1.

Table 1

List of indicators for typology of the studied enterprises according to the characteristic "Possibility of attracting/providing innovations"

Introversion of innovation	Innovation extroversion
1. Share of venture capital Ki1 2. Number of acquired innovations (patents, licenses, copyrights, etc.) Ki2 3. Coefficient of expansion of innovative activity Ki3 4. Coefficient of attracted investments in innovative projects Ki4 5. Coefficient of international openness to innovative products Ki5 6. Share of partnership in the activities of the open innovation system Ki6	1. Share of open innovation revenues Ke1 2. Share of open innovation costs Ke2 3. Innovation attrition rate Ke3 4. Outsourcing rate of non-core functions Ke4 5. Knowledge and technology transfer rate Ke5 6. Percentage of information transferred to modern "open innovation" databases Ke6 7. Actual R&D performance Ke7

Source: author's compilation.

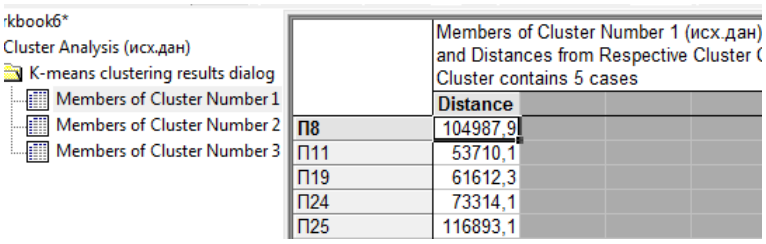


Source: calculated by the author.

Fig. 1. **Listing (fragment of the program) – graphs of average clusters of business structures**

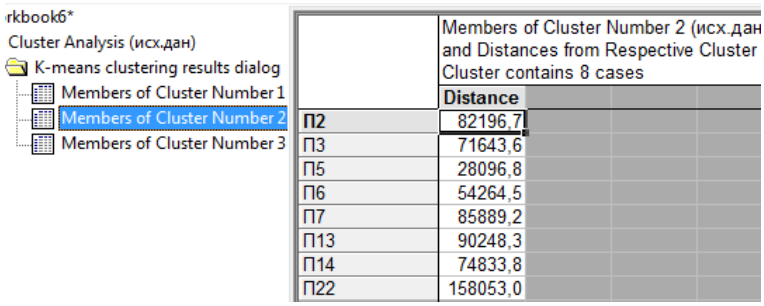
The average graph of each of the obtained clusters is shown in Fig. 1. The cluster analysis and case analysis of typical representatives of the clusters allowed us to confirm the existence of typical variants of the models "Possibility of attracting / providing innovations" and significant relationships between their elements. Multifactor cluster analysis was carried out in order to identify the presence of stable groups of business structures with characteristic relationships between components.

The listing shows that, based on price and technical characteristics, 3 clusters were obtained as a result of the calculations. A description of the clusters obtained as a result of clustering market segments is given in Fig. 2–4.



Source: calculated by the author.

Fig. 2. **Listing (fragment of the program) – business structures included in the 1st cluster**



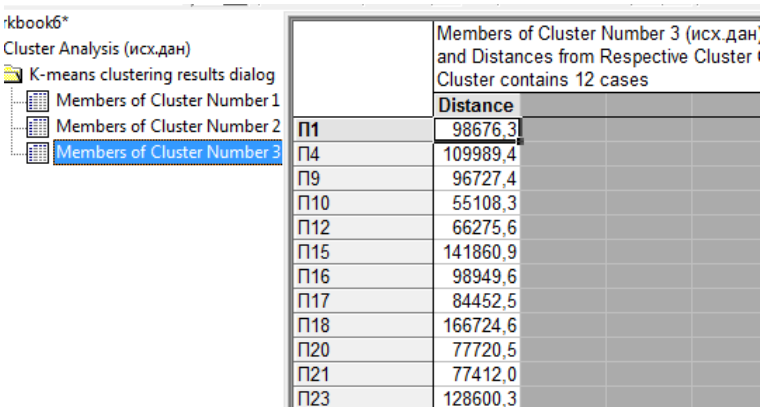
Source: calculated by the author

Fig. 3. **Listing (fragment of the program) – business structures included in the 2nd cluster**

Statistically, the quality of clustering was checked by calculating and evaluating the point-biserial correlation coefficient and C-Index 14, the values of these indices were 0.8 and 0.02, respectively, which indicates a fairly high degree of difference between individual clusters and a high density of observations within clusters.

Based on the results of the classification of business structures, a discriminant model was built to identify their belonging to one of the 3 classes (violents, stakeholders, explents) according to the characteristic "Possibility of attracting/providing innovations". To conduct discriminant analysis, the results of clustering are used, according to which each business structure is assigned the

number of the cluster to which it belongs. Discriminant analysis allows us to recognize new objects, attribute them to existing clusters in order to develop proposals for their corresponding innovative development. The results of the discriminant analysis of the identification of business structures by belonging to one of the three clusters are shown in Fig. 5.

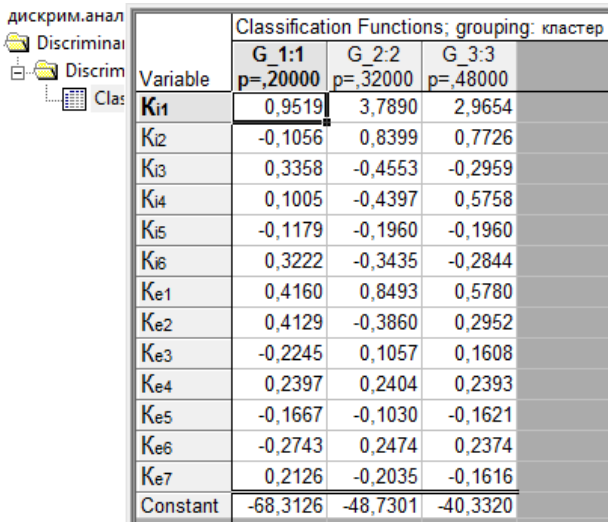

rkbook6*
Cluster Analysis (исх.дан)
K-means clustering results dialog
Members of Cluster Number 1
Members of Cluster Number 2
Members of Cluster Number 3

Members of Cluster Number 3 (исх.дан)
and Distances from Respective Cluster
Cluster contains 12 cases

	Distance
П1	98676,3
П4	109989,4
П9	96727,4
П10	55108,3
П12	66275,6
П15	141860,9
П16	98949,6
П17	84452,5
П18	166724,6
П20	77720,5
П21	77412,0
П23	128600,3

Source: calculated by the author.

Fig. 4. **Listing (fragment of the program) – business structures included in the 1st cluster**


дискрим.анал
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Classification Functions; grouping: кластер

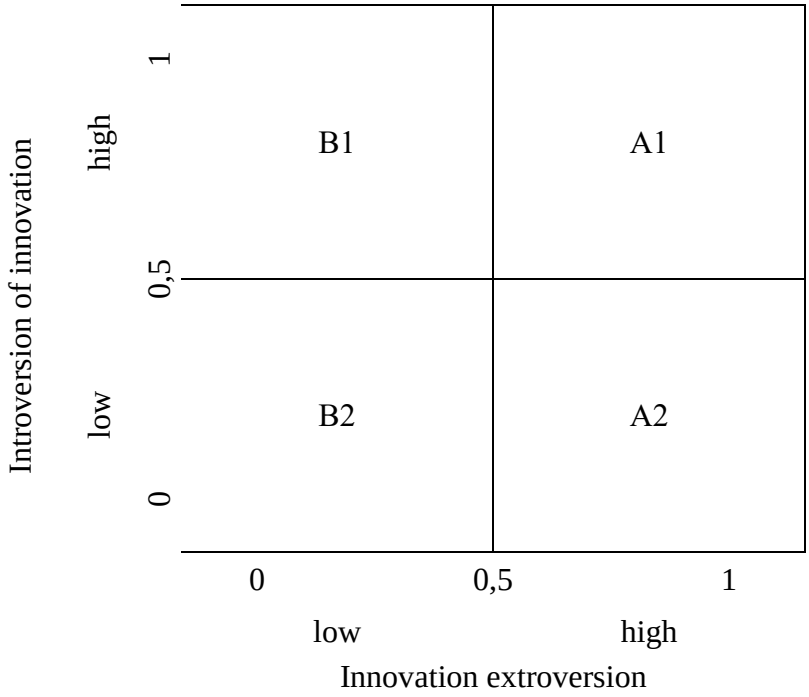
Variable	G_1:1 p=,20000	G_2:2 p=,32000	G_3:3 p=,48000
K_{i1}	0,9519	3,7890	2,9654
K_{i2}	-0,1056	0,8399	0,7726
K_{i3}	0,3358	-0,4553	-0,2959
K_{i4}	0,1005	-0,4397	0,5758
K_{i5}	-0,1179	-0,1960	-0,1960
K_{i6}	0,3222	-0,3435	-0,2844
K_{e1}	0,4160	0,8493	0,5780
K_{e2}	0,4129	-0,3860	0,2952
K_{e3}	-0,2245	0,1057	0,1608
K_{e4}	0,2397	0,2404	0,2393
K_{e5}	-0,1667	-0,1030	-0,1621
K_{e6}	-0,2743	0,2474	0,2374
K_{e7}	0,2126	-0,2035	-0,1616
Constant	-68,3126	-48,7301	-40,3320

Source: calculated by the author.

Fig. 5. **Program listing – results of discriminant analysis of business structures identification by belonging to one of the three clusters**

Information on the distribution of business structures between clusters and the obtained discriminants of the identification model of belonging to one of the 3 classes of violants, stakeholders, explents according to the characteristic "Possibility of attracting / providing innovations".

The next step in building the model is to visualize the obtained results using a two-dimensional matrix. In general, it is presented in Fig. 6.



Source: calculated by the author.

Fig. 6. **Matrix for determining the position of business structures based on the characteristic "Possibility of attracting / providing innovations"**

The positioning of business structures in the proposed matrix along each of the axes (abscissa and ordinate) is proposed to be carried out using the taxonomy method (multidimensional spaces). The taxonomic indicator can take on a value in the interval [0; 1] and has the following interpretation: an individual object in a given period is more developed the closer the value of the generalizing indicator is to unity. It can be used to assess the "average" level of the value of the features characterizing a phenomenon or process achieved in a certain period or moment of time (Porter, 1998).

When constructing a taxonomic indicator, a data matrix composed of standardized features is used. Standardization allows you to get rid of the unit of measurement, both cost and natural. At the same time, the dispersion is leveled, as well as the values of the features, which is undesirable, because because of this, each feature equally affects the results of the analysis (Zhyhalkevych et al., 2018).

The initial data for positioning business structures according to the criterion "Possibility of attracting/providing innovations" were indicators that characterize extraversion (openness of innovations for external use) (Table 2).

The indicators that characterize introversion (the ability to use innovations for internal use) are given in Table 3. This formulation of the task allowed us to obtain a generalized picture of the changes that occur in the set of characteristics.

Table 2

Formulas for calculating innovation introversion indicators

Introversion Innovation Assessments	Calculation formula	Legend
Share of venture capital in total investment	Ki1= VC / I	VC – venture capital I – total investment
Number of innovations acquired (patents, licenses, copyrights, etc.)	Ki2 = OPI	OPI – the volume of acquired innovations (patents, licenses, copyrights, etc.) in monetary terms in a certain period of time
Indicator of expansion of innovation activity	Ki3 = OVNI / OVNA	OVNI – cost of acquired intangible assets for open innovation; OVNA – total cost of intangible assets
Indicator of attracted investments in innovative projects	Ki4 = EIIP / TCIP	EIIP – external investments in an innovation project; TCIP – total costs of an innovation project
Indicator of international openness to innovative products	Ki5 = VRSIP / TVORIP	VRSIP – volume of innovative products sold abroad; TVORIP – total volume of innovative products sold
The specific weight of partnership in the activities of the open innovation system	Ki6 = VPIP / TCIP	VPIP – partners' costs for the innovation project; TCIP – total costs for the innovation project

Source: author's compilation.

Table 3

Formulas for calculating innovation extroversion indicators

Innovation extraversion scores	Calculation formula	Legend
Share of revenues from open innovation	Ke1 = ROI / TRE	ROI – revenues from open innovations TRE – total revenues of the enterprise
Share of spending on open innovation	Ke2 = OIC / OI	OIC – open innovation costs; OI – total enterprise costs
Innovation attrition rate	Ke3 = VIADOI / TVIA	VIADOI – value of intangible assets that have been disposed of for open innovation; TVIA – total value of intangible assets
Outsourcing rate of non-core functions	Ke4 = OFO / VBP	OFO – the volume of functions outsourced; VBP – the total volume of business processes in the enterprise
Knowledge and technology transfer indicator	Ke5 = VIPSA / TVIP	VIPSA – volume of innovative products sold abroad; TVIP – total volume of innovative products sold

End of the Table 3

Innovation extraversion scores	**Calculation formula**	**Legend**
Percentage of information transfer to modern "open innovation" databases	Ке6 = PCIP / TCIP	PCIP – partners' costs for the innovation project; TCIP – total costs for the innovation project
Actual R&D performance	$К_{e7} = \frac{\sum R}{\sum_{i=1}^{N} Q_i - (H_н - H_к)}$	$\sum R$ – total costs for completed work; $H_н$ – costs for transitional (unfinished) work at the beginning of the time period; $H_к$ – costs for transitional (unfinished) work at the end of the time period; N – number of periods; Q_i – risky investments for the i-th period.

Source: author's compilation.

The next step in building a model of innovative development of business structures is to process the obtained characteristics according to the characteristics: introversion and extraversion of innovations. To do this, two initial matrices are compiled for each of the characteristics:

– matrix of introversion indicators: $K_{ii} = [K_{i1}; K_{i2}; K_{i3}; K_{i4}; K_{i5}; K_{i6}]$;

– matrix of extraversion indicators:

$K_{ei} = [K_{e1}; K_{e2}; K_{e3}; K_{e4}; K_{e5}; K_{e6}; K_{e7}]$.

We reduce these matrices to a dimensionless standardized form:

– introversion assessments: $k_i = [k_{i1}; k_{i2}; k_{i3}; k_{i4}; k_{i5}; k_{i6}]$, where $k_i = \frac{K_{ii}}{\overline{K_i}}$;

– extraversion scores: $k_e = [k_{e1}; k_{e2}; k_{e3}; k_{e4}; k_{e5}; k_{e6}; k_{e7}]$, where $k_e = \frac{K_{ei}}{\overline{K_e}}$.

We compose the reference matrices, where 0 is the best value in the columns:

– introversion assessments: $k_{i0} = [k_{i01}; k_{i02}; k_{i03}; k_{i04}; k_{i05}; k_{i06}]$;

– extraversion scores: $k_{e0} = [k_{e01}; k_{e02}; k_{e03}; k_{e04}; k_{e05}; k_{e06}; k_{e07}]$.

Moreover, for the compilation of standard matrices it is necessary to take into account that all indicators are differentiated by the degree of openness to innovations into stimulants and de-stimulators.

For example, stimulants for introversion are such indicators that increase the capabilities of business structures to attract innovations in their activities.

We determine the multidimensional Euclidean distance from it to each studied object, as well as the average value of the Euclidean distance from all objects to the standard by the formulas:

– for assessing introversion:

$$L_i^r = [(k_{i1} - k_{i01})^2 + (k_{i2} - k_{i02})^2 + (k_{i3} - k_{i03})^2 + \\ + (k_{i4} - k_{i04})^2 + (k_{i5} - k_{i05})^2 + (k_{i6} - k_{i06})^2]^{1/2}$$

$$\overline{L_i} = \frac{1}{I} \cdot \sum_{i=1}^{I} L_i^r ;$$

– to assess extraversion:

$$L_i^r = [(k_{e1} - k_{e01})^2 + (k_{e2} - k_{e02})^2 + (k_{e3} - k_{e03})^2 + (k_{e4} - k_{e04})^2 + \\ + (k_{e5} - k_{e05})^2 + (k_{e6} - k_{e06})^2 + (k_{e7} - k_{e07})^2]^{1/2};$$

$$\overline{L_e} = \frac{1}{E} \cdot \sum_{j=1}^{E} L_e^r ,$$

where I is the number of indicators by which business structures are evaluated in terms of introversion of innovations;

E is the number of indicators by which business structures are evaluated in terms of extraversion of innovations.

Further processing of statistical information is carried out by calculating the standard deviations of multidimensional distances and the corresponding generalizing indicators of the development of each business structure regarding introversion/extroversion of innovations:

$$\sigma^i = \frac{1}{I} \cdot \left[\sum_{i=1}^{I} \left(L_i^r - \overline{L_i} \right)^2 \right]^{1\backslash 2}, \sigma^e = \frac{1}{E} \cdot \left[\sum_{i=1}^{E} \left(L_e^r - \overline{L_e} \right)^2 \right]^{1\backslash 2} .$$

The indicator of the level of development of a business structure regarding introversion of innovation is a characteristic of its openness to involving open innovations in its activities, the indicator of the level of development of extraversion of a business structure is a characteristic of its ability to provide open innovations to partners and other enterprises interested in them. Thus, the taxonomy indicators for each of the assessments of the degree of openness to innovation are calculated using the following formulas:

$$\eta_i^r = 1 - \frac{L_i^r}{\overline{L_i} + 2\sigma^i}, \ \eta_e^d = 1 - \frac{L_e^r}{\overline{L_e} + 2\sigma^e}.$$

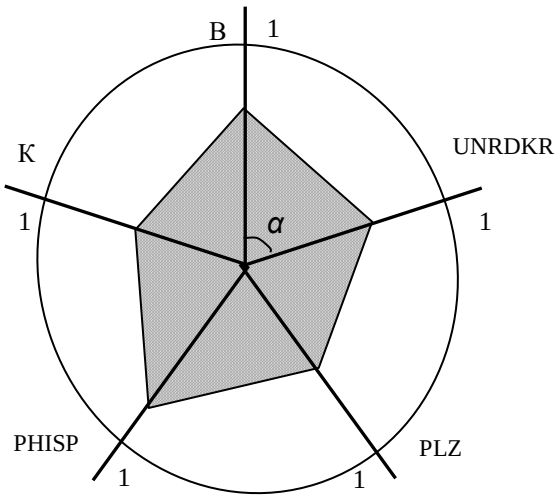
Quantitative analysis of the calculations of taxonomy indicators shows that the closer its value is to 1, the greater the degree to which the business structure is ready to attract or provide innovations.

If the use of taxonomy indicators as a quality in the coordinate system "Introversion / extraversion" will allow determining the position of the business structure in the proposed matrix according to the characteristic "Possibility of attracting / providing innovations", then the magnitude of this position is indicated by the size of the potential of the innovation system. Determination of the potential of business structures, including innovative (IP), according to the method of L.M. Hanushcha-Yefimenko (2009) is based on the use of the radar method, which is based on the calculation of integral indicators for each of the identified subsystems: production subsystem (B); R&D management subsystem, patent and license support subsystem (PLZ); financial and investment support subsystem for innovation projects (FIZIP); commercialization subsystem (K), where the potential value is taken as the area of the radar (IP) built inside the circle. The vectors of this radar are the integral indicators of the development of the subsystems of the innovation system, calculated by the taxonomy method (Fig. 7), where the area of the IP radar is determined by the formula:

$$S_p = 1/2 \sin\alpha \left(a_1 \cdot a_2 \cdot a_3 + ... + a_{n-1} \cdot a_n + a_n \cdot a_1\right),$$

where $a_1 ... a_n$ – the value of integral indicators of the development of innovative subsystems, in fractions of a unit;

α – angle between the nearest indicators, degrees.



Source: constructed by the author.

Fig. 7. **Theoretical view of the radar of the innovative potential of a business structure**

Effective modeling of innovative development of business structures in the post-war period will contribute to:

- acceleration of economic recovery of enterprises;
- increase of investment attractiveness;
- development of high-tech industries;
- creation of new jobs;
- strengthening of competitive positions of Ukrainian business in international markets;
- ensuring sustainable and inclusive economic development.

Conclusions and results of the study. Modeling the innovative development of business structures in the conditions of post-war recovery is a strategic management tool that combines economic forecasting, risk assessment, scenario planning and digital technologies. Its application allows you to form scientifically based strategies for the recovery of enterprises, effectively use limited resources and ensure the transition to an innovative model of economic development. For Ukraine, this is one of the key factors in successful post-war reconstruction, increasing international competitiveness and integration into the European economic space.

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HOW TO CITE THIS ARTICLE

Grytsun, V. (2026). Modeling the innovative development of business structures in the conditions of post-war economic recovery. *Management*, 1(43): 111–123. https://doi.org/10.30857/2415-3206.2026.1.10.

МЕНЕДЖМЕНТ

журнал

Комп’ютерний набір та макетування КРИВОНОС Олена

Технічний редактор ГАНУЩАК-ЄФІМЕНКО Людмила

Відповідальний за поліграфічне виконання ОВЕЧКІНА Лілія

Підп. до друку 29.05.2026. Формат 60×84 1/16.
Ум. друк. арк. 7,2. Облік. вид. арк. 5,64. Наклад 100 пр. Зам. 2401.

Видавець і виготовлювач Київський національний університет технологій та дизайну.
вул. Мала Шияновська, 2, м. Київ, 01011, Україна.

Свідоцтво про державну реєстрацію друкованого засобу масової інформації
Серія КВ № 22130–12030 ПР від 16.05.2016.

Журнал зареєстровано як суб’єкт у сфері друкованих медіа –
ідентифікатор R30-05425 (Рішення Національної Ради від 08.08.2024 р. №2520).

Свідоцтво про внесення суб’єкта видавничої справи до державного реєстру видавців,
виготівників і розповсюджувачів видавничої продукції ДК № 993 від 24.07.2002.

MANAGEMENT

Journal

Computer Typesetting & Modeling KRYVONOS Olena

Technical Editor HANUSHCHAK-YEFIMENKO Liudmyla

Responsible for printing OVECHKINA Liliia

Printing proof 29.05.2026. Format 60×84 1/16.
Conditional sheet 7.2. Calculated sheet 5.64. Circulation 100 copies. Order N 2401.

KNUTD Instant Printing Department.
Mala Shyianovska Street, 2, Kyiv, 01011, Ukraine.

Certificate КВ № 22130–12030 ПР, 16.05.2016.

Identifier-print media R30-05425 (Decision of the National Council dated August 8, 2024 No. 2520).

Certificate ДК № 993, 24.07.2002.