МЕНЕЖМЕНТ
MANAGEMENT

UDC 005.21:005.591.6:005.332.4:004
doi: https://doi.org/10.15330/apred.1.22.9-24

Тюхтенко Н.А.

КОНЦЕПЦІЯ ВІДКРИТИХ ІННОВАЦІЙ ЯК СТРАТЕГІЧНИЙ ІНСТРУМЕНТ ЗАБЕЗПЕЧЕННЯ КОНКУРЕНТНОГО ЛІДЕРСТВА В УМОВАХ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ

Одеський національний університет імені І. І. Мечникова,
Міністерство освіти і науки України,
кафедра менеджменту та інновацій,
Всеволода Змієнка, 2, м. Одеса,
65082,Україна,
тел.: +380505229717
e-mail: n.tuhtenko@onu.edu.ua
ORCID: https://orcid.org/0000-0003-4634-9139

Анотація. У представленій статті досліджено концепцію відкритих інновацій як стратегічного інструменту формування та забезпечення конкурентного лідерства підприємств в умовах цифрової трансформації економіки з урахуванням процесів управління знаннями і талантами, що визначають результативність відкритих інновацій. Представлено еволюцію теоретичних поглядів на інноваційний процес від традиційної закритої моделі, орієнтованої на власні дослідницькі підрозділи, до відкритої моделі інновацій, яка передбачає цілеспрямоване управління потоками знань між організацією та зовнішнім середовищем (партнери, споживачі, поставщики, стартами, конкуренти тощо). Обгунтовано важливість поняття абсорбційної спроможності як інтегральної динамічної здатності організації виявляти, засвоювати, ефективно використовувати та трансформувати зовнішні знання від науково-дослідних установ, закладів освіти, партнерів, стартапів, клієнтів тощо. Високий рівень абсорбційної спроможності підприємства доводить його здатність гнучко інтегрувати зовнішні знання в управлінські та організаційні компетентності, що дозволяє отримувати нові продукти, технології, бізнес-процеси для конкурентного лідерства. Доведено важливість внутрішніх управлінських ролей – "вартових знань" та цифрових систем управління ідеями у перетворенні зовнішніх знань на інноваційний результат. Обгрунтовано, що саме абсорбційну спроможність організації слід розглядати як сполучну ланку між управлінням знаннями, цифровою трансформацією та концепцією відкритих інновацій. Розглянуто перехід від закритої моделі управління персоналом до відкритої талант-екосистеми, яка охоплює штатних співробітників, запозичений, фріланс- та краудсорсинговий талант. На основі узагальнення практичного досвіду систематизовано типові ризики й перешкоди впровадження відкритих інновацій у цифровому середовищі. Запропоновано їх класифікацію за трьома взаємопов'язаними вимірами: технологічним, знаннєвим і талант-управлінським, що комплексно відображають ключові виклики цифрової трансформації. У статті запропоновано поетапну стратегічну модель інтеграції відкритих інновацій, управління знаннями та управління талантами в систему, спрямовану на досягнення та збереження конкурентного лідерства підприємства.

Ключові слова: відкриті інновації, цифрова трансформація, конкурентне лідерство, управління знаннями, абсорбційна спроможність, управління талантами, відкрита талант-економіка, компетенції, краудсорсинг, інноваційна екосистема.

Tyukhtenko N.A.

THE OPEN INNOVATION CONCEPT AS A STRATEGIC TOOL FOR ENSURING COMPETITIVE LEADERSHIP IN THE CONDITIONS OF DIGITAL TRANSFORMATION

Odesa I. I. Mechnikov National University,
Ministry of Education and Science of Ukraine,
Department of Management and Innovation,
Vsevoloda Zmiienka St. 2, Odesa,
65082, Ukraine,
tel.: +380505229717
e-mail: n.tuhtenko@onu.edu.ua
ORCID: https://orcid.org/0000-0003-4634-9139

Abstract. This article researches the concept of open innovation as a strategic tool for establishing and maintaining competitive leadership for enterprises in the context of the digital transformation of the economy, taking into account the knowledge and talent management processes that determine the effectiveness of open innovation. This paper presents the evolution of theoretical perspectives on the innovation process, from the traditional closed model – which focuses on an internal research department – to an open innovation model, which involves the targeted management of knowledge flows between the organization and its external environment (partners, consumers, suppliers, start-ups, competitors, etc.). The importance of the concept of absorptive capacity as an organization's integral dynamic ability to identify, assimilate, effectively use and transform external knowledge from research institutions, educational establishments, partners, start-ups, customers, etc. A high level of organizational absorptive capacity demonstrates the organization's ability to integrate external knowledge into its managerial and organizational competencies, enabling it to develop new products, technologies and business processes to achieve competitive leadership. The importance of internal management roles – 'knowledge gatekeepers' – and digital idea management systems in transforming external knowledge into innovative outcomes has been demonstrated. It is argued that it is precisely an organization's absorptive capacity that should be regarded as the link between knowledge management, digital transformation and the concept of open innovation. The transition from a closed human resource management model to an open talent ecosystem encompassing internal employees, borrowed talent, freelance talent, and crowdsourced talent is examined. Based on the synthesis of practical experience, the study systematizes the typical risks and barriers to the implementation of open innovation in the digital environment. A classification framework is proposed that groups these risks into three interrelated dimensions: technological, knowledge, and talent management, providing a comprehensive reflection of the key challenges associated with digital transformation. The paper proposes a stage-based strategic model for integrating open innovation, knowledge management, and talent management into the system to achieve and sustain enterprise competitive leadership.

Keywords: open innovation, digital transformation, competitive leadership, knowledge management, absorptive capacity, talent management, open talent economy, competencies, crowdsourcing, innovation ecosystem.

Introduction. The dynamic development of the global economy, intensifying international competition, the accelerating pace of technological change, and the growing complexity of regional challenges have fundamentally transformed the paradigms of innovation management. Knowledge and competencies have become the primary drivers of sustainable development and organizational competitiveness. Consequently, the traditional closed innovation model, based exclusively on an organization's internal resources, has become increasingly insufficient, costly, and slow in ensuring competitive leadership. Instead, the ability to adapt quickly to global technological and market changes is becoming a decisive

factor in an organization's success, which underlines the growing importance of the concept of open innovation in strategic management.

H. Chesbrough, who established the foundations of this paradigm, demonstrated that external knowledge serves as a natural complement to and enhancer of an organization's internal capabilities [1, p. 2; 2, p. 1]. The concept of open innovation proposed by H. Chesbrough advocates the purposeful integration of both internal and external sources of knowledge, technologies, and ideas to create innovation value. This study argues that the open innovation concept constitutes a key prerequisite for building an effective management system capable of achieving an organization's strategic objectives, strengthening competitive leadership, and ensuring its long-term sustainable development.

According to International Data Corporation estimates, global spending on digital transformation in 2026 will exceed 3.4–4 trillion US dollars with an average annual growth rate of about 16% [3; 4], and total spending on information and communication technologies is approaching 4–7 trillion US dollars [4].

Such rapid digital transformation of the business environment (artificial intelligence, big data, Internet of Things, cloud computing, digital platforms, etc.) necessitates the active involvement of external knowledge, competencies, and partner resources. It is open innovation – unlike the traditional model of closed innovation – that allows organizations to change the architecture of their business, expanding partnership networks, integrating into innovation ecosystems, and using existing resources more effectively. At the same time, transaction costs associated with identifying and collaborating with external partners are significantly reduced, innovation cycles are accelerated, and new channels are created to access the global pool of ideas, knowledge, technologies, and human capital. If in the pre-digitalization period this was more relevant for large corporations, in today's conditions open innovation is also becoming available to small and medium-sized enterprises [5, p. 87], which allows them to better adapt to the challenges of the global and regional levels.

It is therefore unsurprising that the open innovation paradigm has been further developed in the works of numerous scholars. In 2006, J. West and S. Gallagher extended this paradigm to open-source software communities. They demonstrated that participation in open innovation processes is driven not only by economic and financial benefits but also by intangible incentives, including the pursuit of professional recognition, enhanced reputation, the expansion of social capital, the acquisition of new knowledge and competencies, and the development of collaborative networks [6, p. 319]. In 2009, E. Enkel, O. Gassmann, and H. Chesbrough further refined the typology of open innovation by distinguishing three innovation processes: outside-in, inside-out, and coupled, each representing a different direction of knowledge flows and collaboration between the organization and its external environment [7, p. 311].

W. Vanhaverbeke advanced the open innovation concept by introducing the concept of the *innovation network* as a form of interorganizational collaboration that enables the effective exchange of knowledge and resources among innovation actors, thereby creating the conditions required for the successful implementation of open innovation [8, p. 205].

The concept of absorptive capacity, developed by W. Cohen and D. Levinthal, provides an important theoretical foundation for the development of the open innovation paradigm. It suggests that the effective utilization of external knowledge sources depends on an organization's ability to recognize the value of new information, assimilate it, integrate it with existing knowledge, and exploit it to generate innovations and achieve commercial outcomes [9, p. 128].

Sh. Zahra and G. George further refined the concept of absorptive capacity by distinguishing between potential absorptive capacity (the organization's ability to acquire and

assimilate external knowledge) and realized absorptive capacity (its ability to transform and exploit such knowledge for innovation and economic performance) [10, p. 186].

Subsequent research on absorptive capacity has emphasized the role of *knowledge gatekeepers* and *boundary spanners*, who facilitate the identification, evaluation, translation, and transfer of external knowledge into an organization's internal innovation processes, thereby enhancing its capacity to benefit from open innovation [11; 12].

D. Chiaroni, V. Chiesa, and F. Frattini proposed an implementation model for open innovation, according to which the transition from a closed to an open innovation model is viewed as a dynamic process of organizational change encompassing three sequential stages: unfreezing, moving, and institutionalization. This process involves the transformation of interorganizational networks, organizational structures, innovation evaluation processes, and knowledge management systems. Their study demonstrated that open innovation is not merely a mechanism for generating new ideas but also a key element of innovation management and an important driver of sustainable competitive advantage [13].

M. Drechsler and M. Natter (2012) conducted a systematic review of 62 empirical studies on open innovation. They concluded that the effectiveness of open innovation depends on firm size, industry characteristics, the nature of collaborative partnerships, and the external business environment. Their findings highlight the need for further research, particularly on the impact of digital transformation on the effectiveness of open innovation implementation and its role in building competitive advantage in emerging markets [14, p. 325].

In 2014, H. Chesbrough and M. Bogers refined the definition of open innovation in the context of digital transformation by emphasizing the growing role of digital platforms in facilitating interactions among diverse innovation actors. They argued that open innovation is based on the purposive management of knowledge flows across organizational boundaries, thereby fostering the development of digital innovation ecosystems [15, p. 17].

Building on decades of research in the field of open innovation, M. Bogers and colleagues (2018) synthesized the major research streams by distinguishing organizational, network, and ecosystem levels of analysis. Particular attention was devoted to the digital dimension of open innovation, which fundamentally transforms the mechanisms of knowledge creation, diffusion, and exploitation while enabling new forms of networked collaboration among innovation actors [16, p. 5].

The transformation of talent management within the context of open innovation models remains comparatively underexplored. In this regard, the Deloitte report substantiates the transition from the traditional internal workforce model to an "open talent economy," in which organizations strategically combine internal employees with borrowed, freelance, and crowdsourced talent to enhance innovation capabilities [17]. Several scholars further emphasize that the role of human resource management in developing the social mechanisms that facilitate the absorption of external knowledge within collaborative innovation projects remains insufficiently investigated from an empirical perspective [18].

The Ukrainian research tradition in the field of open innovation is still evolving. Y. Panchenko and M. Kyriakova were among the first Ukrainian scholars to provide a systematic analysis of H. Chesbrough's open innovation concept and to adapt it to the activities of multinational corporations [19]. Their work stimulated further academic interest in open innovation, innovation networks, and innovation ecosystems. L. Fedulova considers open innovation to be an integral component of the knowledge economy that enhances the competitiveness of enterprises and regions. Her research emphasizes the importance of developing innovation networks, strengthening partnerships among business, academia, and government, and fostering innovation ecosystems as environments for knowledge creation and diffusion [20; 21].

I. Pidorycheva conceptualizes innovation ecosystems as a contemporary organizational form for implementing open innovation, enabling effective collaboration among businesses, research institutions, higher education institutions, public authorities, and civil society. According to the author, the open exchange of knowledge, the development of strategic partnerships, and the active involvement of stakeholders in innovation processes create the conditions necessary for enhancing the innovation capacity of organizations and regions. These factors accelerate digital transformation while fostering sustainable competitive advantages through the development of regional and national innovation ecosystems, strengthened collaborative networks, and Ukraine's integration into the European Research Area (ERA) [22–24]. O. Nosyk associates the concept of open innovation with the development of open innovation ecosystems, emphasizing the role of innovation networks, human capital, and collaborative partnerships in fostering innovation-driven development and organizational competitiveness [25].

The ideas proposed by S. Parubets further expand the contemporary understanding of open innovation by arguing that organizational competitiveness in the digital economy depends not only on internal resources but also on the extent of organizations' integration into national and international knowledge networks. In this context, open innovation serves as a mechanism for overcoming the fragmentation of innovation systems and as a strategic instrument for building competitive advantages in the context of digital transformation [26].

Despite the substantial body of research in the field of innovation management, important gaps remain in understanding how digital transformation reshapes the mechanisms and effectiveness of open innovation and which managerial practices are most effective in the digital environment. In the majority of the studies reviewed, open innovation, digital transformation, knowledge management, talent management, the development of contemporary managerial competencies, and innovation culture are examined as separate and insufficiently interconnected research domains. As a result, the question of their systematic integration into a unified strategic framework for ensuring enterprise competitive leadership remains largely unexplored.

At the same time, the current realities of the Ukrainian economy, shaped by the ongoing war and the country's aspiration for deeper integration into the European and global communities, significantly increase the strategic importance of the open innovation concept. Under these conditions, open innovation serves as a foundation for strategic decision-making aimed at strengthening organizational competitive leadership and enhancing the competitiveness and resilience of the national economy in the context of post-war recovery.

Task Statement. Digital transformation has fundamentally reshaped the business environment, giving new meaning to the concept of open innovation. Contemporary digital technologies, collaborative platforms, and remote communication tools facilitate cooperation among companies, research and higher education institutions, suppliers, customers, and other innovation stakeholders. As a result, organizations are able to accelerate innovation processes, enhance organizational agility, and strengthen their capacity to achieve sustainable competitive advantages. This study argues that the effective implementation of the open innovation concept requires a reconsideration of traditional strategic management approaches. In particular, organizations need to develop new managerial competencies, adopt strategic talent management practices, strengthen organizational learning and employee development systems, and foster an innovation-oriented organizational culture capable of supporting continuous knowledge exchange and collaborative value creation.

The aim of this paper is to substantiate the theoretical foundations and practical framework of the open innovation concept in the context of digital transformation and to develop a strategic model for integrating open innovation, knowledge management, and talent management into the enterprise management system to strengthen competitive leadership.

To achieve the research objective, a combination of general scientific methods was employed, including theoretical generalization and systematic analysis of the literature, comparative analysis, case study analysis, classification, structural and logical analysis, abstract-logical generalization, and structural modeling. The study is theoretical and methodological in nature and is based on the analysis of scientific publications, industry reports (IDC and Deloitte), and official corporate sources. The application of these methods made it possible to extend the existing body of knowledge in innovation management and to provide a deeper understanding of the open innovation concept as a strategic instrument for strengthening competitive leadership in the context of digital transformation. Particular attention is devoted to substantiating the mechanisms for integrating open innovation into the enterprise's strategic management system in order to build sustainable long-term competitive advantages.

Results. The increasing relevance of the open innovation concept reflects the objective evolutionary shift from the traditional closed innovation model. The latter assumes that an enterprise maintains full control over the entire innovation process, including idea generation, research and development, product and service development, commercialization, marketing, distribution, and customer support. Within the closed innovation model, external partners perform primarily supporting functions as suppliers or contractors, whereas intellectual property is regarded as an exclusive organizational asset and remains under the full control of the enterprise.

In contrast, the logic of the open innovation model is based on the premise that innovative ideas and solutions may originate not only within an organization but also beyond its boundaries. Accordingly, three principal open innovation processes can be distinguished:

1. Outside-in (inbound) process – the purposeful acquisition and integration of external ideas, technologies, and knowledge into the organization's internal innovation process.

2. Inside-out (outbound) process – the commercialization and transfer of internally developed technologies, knowledge, and intellectual property to external organizations through licensing, technology transfer, spin-offs, or other market mechanisms.

3. Coupled process – the integration of the outside-in and inside-out processes through strategic alliances, joint ventures, innovation networks, and other collaborative partnerships, in which innovation outcomes, resources, and risks are shared among the participating partners.

The transition from the closed innovation model to the open innovation model is an evolutionary and gradual process driven by ongoing digital and organizational transformations as well as by the changing principles of innovation management.

To illustrate these differences, Table 1 presents a comparative analysis of the two innovation models based on a set of key characteristics.

The analysis presented in Table 1 indicates that value creation is no longer determined exclusively by an organization's internal research capabilities. In the context of rapid and far-reaching transformations of the business environment, organizations increasingly rely on innovative ideas originating beyond their formal boundaries. Consequently, the key challenge for management is not merely to access external knowledge and resources, but to effectively orchestrate knowledge and talent flows through the development of a high-performance innovation culture capable of supporting continuous collaboration, learning, and innovation [35, 36].

Table 1

Comparative characteristics of closed and open innovation models

Comparison Criteria	**Closed Innovation Model**	**Open Innovation Model**
Sources of Innovative Ideas	Internal R&D units and internally generated ideas	Internal and external sources of innovation, including customers, suppliers, educational institutions, research organizations, startups, and competitors
Intellectual Property Management	Maximum protection and limited use of intellectual property	Active licensing, shared use of intellectual property rights, and commercialization of unused patents
Commercializa-tion Pathways	A single internal route to market	Multiple commercialization channels, including spin-off companies, joint ventures, strategic alliances, and partnerships
Approach to Talent Management (HR-management)	Exclusively internal researchers and developers	Synergy between internal employees and borrowed, freelance, and crowdsourced talent
Knowledge Flows	Predominantly internal knowledge creation and utilization	Bidirectional knowledge flows and active exchange of knowledge with external stakeholders
Innovation Ecosystem	Innovation activities concentrated within organizational boundaries	Innovation activities embedded in networks, ecosystems, and collaborative platforms
Role of Digital Technologies	Supporting internal R&D and business processes	Enabling collaboration, co-creation, digital platforms, and global innovation networks
Strategic Orientation	Achieving competitive advantage through internal capabilities and secrecy	Achieving competitive advantage through openness, collaboration, and access to external knowledge and competencies

Source: compiled by the author based on [1, 2, 6, 16].

In the context of the digital challenges of an increasingly globalized economy, open innovation should be viewed as a strategic catalyst for enhancing organizational adaptability and resilience in response to transformational change. Empirical studies indicate that only approximately one-third of digital transformation initiatives successfully achieve their intended outcomes [27]. Organizational executives identify the growing complexity of the technological environment and the shortage of highly qualified specialists as the principal barriers to successful digital transformation [28].

These findings highlight a fundamental challenge of the contemporary business environment: *the availability of digital technologies alone does not guarantee higher levels of organizational innovativeness*. Instead, *the critical success factor lies in the effective integration of digital technologies into the enterprise management system through knowledge management and talent management, underpinned by a strong innovation-oriented organizational culture.*

These findings underscore the importance of understanding the interrelationship between the open innovation concept and the digital transformation of the business

environment (Figure 1). On the one hand, digital technologies provide the technological infrastructure required for the effective implementation of open innovation. On the other hand, the logic of open innovation gives digital transformation a clear strategic orientation by directing investments beyond the automation of business processes toward the development of digital platforms that enable collaboration with external innovation and talent ecosystems.

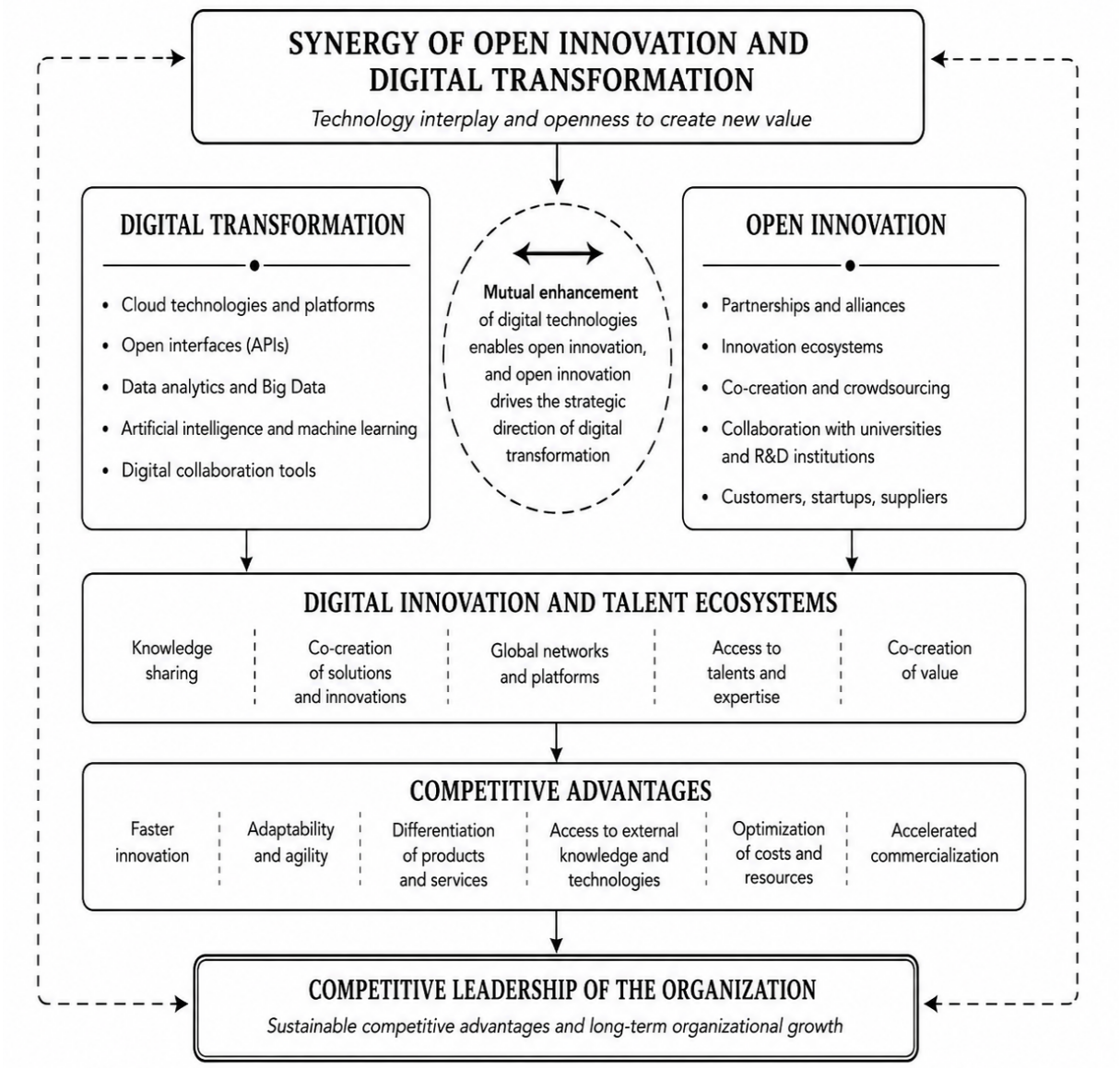

Fig. 1. The interdependence of digital transformation and open innovation in shaping the competitive leadership of an organization.

Source: developed by the author based on [1, 2, 5, 6, 15, 16, 29], with the assistance of the generative artificial intelligence tool ChatGPT for visualization.

It is important to emphasize that contemporary research increasingly views open innovation through the lens of integrated digital innovation ecosystems. In such ecosystems, diverse stakeholders collaboratively develop technological assets, common standards, and shared digital infrastructure, significantly enhancing the scale, speed, and effectiveness of organizational adaptation to the challenges of digital transformation compared with traditional organizational models [20, 30].

Within the conceptual framework presented in Figure 1, which illustrates the interrelationship between open innovation and digital transformation in achieving competitive

leadership, knowledge management and talent management emerge as critical enabling mechanisms.

Knowledge management provides the substantive mechanism through which open innovation operates, while digital transformation establishes the technological infrastructure that enables it. The extent to which the global information space is transformed into genuine innovation depends on the organization's ability to identify, assimilate, and exploit external knowledge effectively. As is well established in the knowledge management literature, organizational knowledge comprises both explicit knowledge, which is codified and can be readily transferred, and tacit knowledge, which is embedded in individuals' experience and is difficult to codify. The transformation of these two forms of knowledge occurs through the processes of socialization, externalization, combination, and internalization (the SECI model). This dynamic process constitutes the foundation of organizational knowledge creation in the classical theory of knowledge management [31].

In the context of open innovation, however, the processes of knowledge creation and knowledge management become considerably more complex because a substantial proportion of tacit knowledge initially resides outside the organization's boundaries. A key concept explaining an organization's ability to transform external knowledge into innovation outcomes is ***absorptive capacity***. It is defined as the ability to recognize the value of new external knowledge, assimilate it, and exploit it for commercial purposes [32]. The absorptive capacity framework distinguishes two complementary dimensions:

- Potential absorptive capacity (PACAP) – the organization's ability to acquire and assimilate external knowledge;
- Realized absorptive capacity (RACAP) – the organization's capability to transform and exploit external knowledge by converting it into innovative products, services, and business processes.

The relationship between these two dimensions can be assessed through the absorptive capacity efficiency ratio, which reflects the extent of knowledge loss occurring during the internal dissemination and utilization of acquired knowledge [10]. The complementary concept is *desorptive capacity*, defined as an organization's capability to effectively transfer its internally generated knowledge, technologies, and intellectual assets to external partners within outbound open innovation processes. It should be emphasized that absorptive and desorptive capacities are complementary rather than competing capabilities, jointly supporting the effective management of inbound and outbound knowledge flows across organizational boundaries [33].

In practice, absorptive and desorptive capacities are operationalized through dedicated managerial roles that are increasingly augmented by digital technologies. Artificial intelligence–driven analytics and digital idea management systems support the preliminary screening and evaluation of large volumes of externally generated ideas and proposals. Consequently, managers can concentrate on the strategic assessment of the most promising opportunities, effectively integrating the technological infrastructure of digital transformation with organizational knowledge management.

Table 2

Characteristics of the main elements of knowledge management in the open innovation system

Knowledge Management Element	Characteristics	Digital Support Mechanism
Potential Absorptive Capacity	The ability to identify, acquire, and assimilate valuable external knowledge	Technology scouting platforms, big data analytics, and environmental scanning systems

Continuation of table 2

Realized Absorptive Capacity	The ability to transform assimilated knowledge into products, services, and business processes	Idea management systems, digital R&D platforms, and collaborative innovation tools
Desorptive Capacity	The ability to transfer and commercialize internal knowledge through external partners	Licensing platforms, open patent databases, and Application Programming Interfaces (APIs)
Managerial Roles (Knowledge Guards / Boundary Spanners)	Selection, evaluation, translation, and integration of external knowledge for internal use	AI-driven idea analytics, innovation dashboards, and digital project management platforms

Source: compiled by the author based on [10, 11, 12, 31, 32, 33]

Table 2 presents a systematized overview of the key knowledge management elements within the open innovation framework that contribute to strengthening enterprise competitive leadership in the digital era.

Among the contemporary trends in human resource management, the development of an open talent ecosystem has become particularly significant. According to the Deloitte report, the "open talent economy" is defined as a collaborative, transparent, and technology-enabled approach to organizing work through networks and ecosystems, replacing the traditional full-time employment model [17]. This open model is based on the premise that innovative ideas and critical competencies increasingly originate from individuals who are not formally employed by the organization. Within this framework, talent is conceptualized as comprising several distinct categories, the characteristics of which are summarized in Table 3.

Table 3

Content of the category "talent" in the open innovation ecosystem of a modern enterprise

Type of Talent	Characteristics	Examples of Engagement Mechanisms in the Digital Environment
Internal (Payroll) Talent	Permanent employees integrated into the organizational structure of the company	Internal career management platforms, internal mobility systems, and talent marketplaces
Borrowed Talent	Consultants, contractors, and specialists employed by partner organizations and engaged on a temporary basis	Vendor Management Systems (VMS) and contingent workforce management platforms
Freelance Talent	Independent professionals who openly offer their services on a project or temporary basis	Freelance marketplaces and digital talent marketplaces
Crowdsourced (Open Source) Talent	A large, predominantly anonymous community of participants involved in innovation challenges and open collaboration initiatives	Crowdsourcing platforms such as NASA Solve, NASA Space Apps Challenge, LEGO Ideas, and Wazoku

Source: compiled by the author based on [17]

It should be emphasized that the development of an open talent ecosystem is inherently linked to the integration of knowledge management and talent management. A well-known example of this successful synergy is Procter & Gamble's *Connect + Develop* initiative. The

company's decision to launch the program was supported by a striking fact: for every P&G researcher working in a particular field, there are approximately 200 scientists and engineers with comparable expertise outside the organization. Furthermore, the global pool of potential external experts exceeds 1.5 million individuals, compared with only a few thousand researchers employed internally by the company [34].

These findings demonstrate that, within the open innovation paradigm, knowledge management and talent management become closely integrated at the operational level, effectively functioning as a unified managerial capability. At the same time, the implementation of an open talent ecosystem creates new challenges for human resource management, among which the following deserve particular attention:

- positioning the organization's innovation ecosystem brand to effectively present the organization to prospective external contributors and innovation partners;
- developing an organizational talent marketplace – a digital platform that enhances the internal mobility of employees according to their competencies while facilitating the rapid formation of cross-functional teams for the implementation of open innovation projects;
- establishing social integration mechanisms – including trust, a shared language, common norms of interaction, and an innovation-oriented organizational culture – that enable the effective integration of internal and external talent. Without such mechanisms, even high-quality external ideas are unlikely to be successfully assimilated by internal teams, regardless of the organization's absorptive capacity [17, 18, 37].

Accordingly, one of the key managerial implications is the increasing demand for *T-shaped professionals*, whose competencies combine deep expertise in a specific domain with broad interdisciplinary knowledge and collaborative skills, enabling effective interaction with external partners within open innovation ecosystems.

The findings confirm the considerable potential of open innovation as a strategic instrument for achieving organizational competitive leadership in the context of digital transformation. However, its practical implementation is accompanied by a range of risks and barriers. Their systematization makes it possible to distinguish three interrelated dimensions: technological, knowledge-related, and talent management. Each of these dimensions is examined in the following sections.

From a technological perspective, expanding digital collaboration with external partners increases organizations' exposure to cybersecurity risks and cyber threats. Survey evidence indicates that the complexity of the digital environment (identified by approximately 32% of respondents) and insufficient technical expertise (reported by approximately 27% of respondents) represent two of the most significant obstacles to successful digital transformation [28].

From a knowledge management perspective, the principal risks include the leakage of intellectual property and confidential information resulting from the expanding involvement of external participants in innovation processes. Another major challenge identified in the literature is insufficient absorptive capacity. This situation arises when valuable external knowledge enters the organization but fails to be transformed into innovative products or processes because of inadequate employee competencies, limited organizational resources, or insufficient managerial support [10, 32, 37]. Furthermore, researchers emphasize the role of organizational and managerial culture as a significant barrier. Employees and, in many cases, managers may perceive externally generated ideas not as opportunities for organizational development but as threats to their own expertise, authority, or professional reputation [34, 35].

From the talent management perspective, the principal risks include:

- dependence of innovation processes on external talent, whose contributors are not formally employed by the organization and, therefore, may demonstrate lower commitment and limited availability when their expertise is required;
- the risk of losing key boundary-spanning professionals whose competencies are essential for attracting and coordinating external talent. The departure of such individuals may significantly weaken the organization's established network of external partnerships;
- legal uncertainty regarding intellectual property rights associated with innovations jointly developed through collaborative partnerships;
- the risk of fragmentation, arising from the fact that open innovation initiatives are often implemented in isolation and remain insufficiently integrated into the organization's core decision-making processes, thereby limiting their contribution to value creation [17, 38].

Considering the importance of addressing the identified risks and barriers associated with the implementation of open innovation in contemporary enterprises, Figure 2 presents their systematized classification. Awareness of these challenges enables organizations to mitigate potential losses of competitive advantage and improve the effectiveness of open innovation implementation.

The theoretical and practical insights presented in this study demonstrate that achieving competitive leadership in the context of digital transformation requires the strategic integration of open innovation, knowledge management, and talent management. Based on these findings, a stage-based strategic model is proposed to integrate these management components into the enterprise management system, thereby strengthening sustainable competitive leadership (Figure 3).

The first stage focuses on a comprehensive assessment of the organization's technological capabilities, digital maturity, absorptive capacity (both potential and realized), and the composition of its internal and external talent engaged in innovation activities.

The second stage defines the appropriate degree of openness of the innovation process in accordance with the organization's strategic objectives and determines the most suitable open innovation model (outside-in, inside-out, or coupled). At the same time, a talent strategy is formulated to identify which competencies should be retained internally and which can be acquired from external sources through borrowed, freelance, or crowdsourced talent.

The third stage involves developing a digital infrastructure for collaboration with the external environment, including open APIs, idea management systems, and crowdsourcing platforms. Simultaneously, dedicated managers are appointed to identify, attract, coordinate, and maintain relationships with external talent and innovation partners.

The fourth stage focuses on building a partnership, knowledge, and talent ecosystem by establishing long-term relationships with universities, research institutions, start-ups, suppliers, customers, freelance professionals, and crowdsourcing communities. This ecosystem creates a sustainable flow of both external ideas and external competencies that supports continuous innovation.

The fifth stage represents the integration of knowledge, competencies, and innovation outcomes generated through collaboration with the external partnership, knowledge, and talent ecosystem into the organization's business model. This integration is achieved through formalized absorptive capacity mechanisms, enabling selected external ideas to be transformed into specific technological, product, process, and managerial innovations, with clearly assigned organizational responsibilities.

The sixth and final stage involves the continuous monitoring of key performance indicators (KPIs), including: the share of products developed through the use of external knowledge and external talent; the organization's absorptive capacity efficiency ratio; the speed of bringing innovative solutions to the market; the level of engagement of the external innovation community; the retention rate of professionals responsible for managing

relationships with the external environment and adapting the ecosystem to changing conditions.

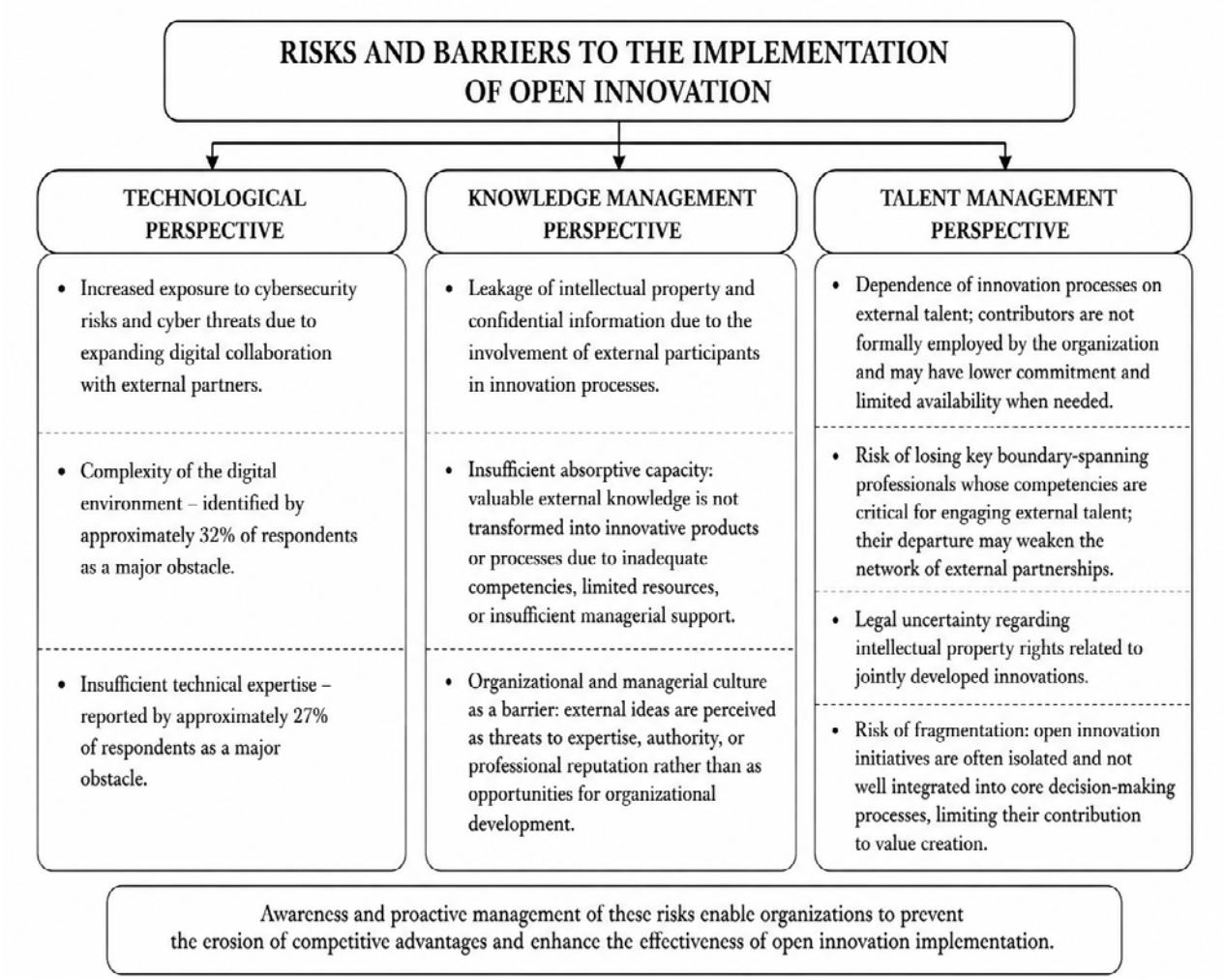

Fig.2. Risks and barriers to the implementation of open innovation across the technological, knowledge management, and talent management dimensions.
Source: developed by the author based on [10, 17, 18, 28, 32, 34, 35, 37, 38] with the assistance of the generative artificial intelligence tool ChatGPT for visualization.

The consistent implementation of the proposed strategic model enables organizations to adopt the open innovation concept as an effective mechanism for establishing and sustaining competitive leadership. In our view, a modern management architecture should be built upon the integrated application of digital transformation, knowledge management, and talent management, allowing organizations to respond more flexibly to complex global and local changes at both the operational and strategic levels.

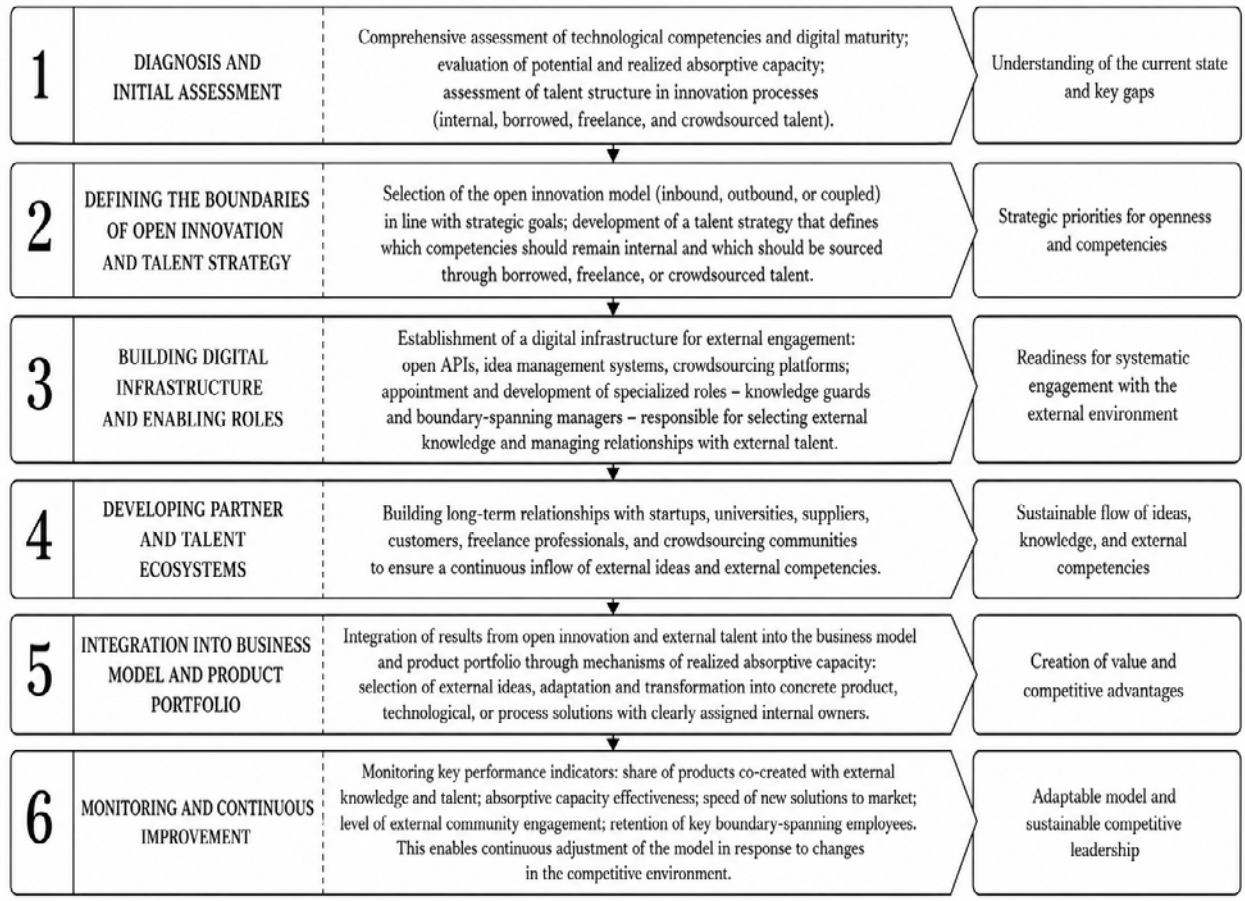

Fig. 3. Stage-Based Strategic Model for Integrating Open Innovation, Knowledge Management and Talent Management into the Enterprise Management System to Strengthen Competitive Leadership

Source: Developed by the author based on the literature reviewed [1, 2, 6–18, 20–38], with the assistance of the generative artificial intelligence tool ChatGPT for visualization.

Conclusions. The study substantiates the importance of the open innovation concept in the context of digital transformation as a strategic instrument for achieving organizational competitive leadership. At the same time, the mere availability of digital platforms does not guarantee successful innovation or competitive advantage. Rather, the effectiveness of open innovation depends primarily on the organization's absorptive capacity—its ability to recognize, assimilate, transform, and exploit external knowledge—as well as on its capability to develop an open talent ecosystem that integrates internal employees with borrowed, freelance, and crowdsourced talent.

The stage-based strategic model proposed in this study integrates open innovation, knowledge management, and talent management into a unified enterprise management system. The model enables organizations to systematically address the opportunities, constraints, and risks associated with open innovation, thereby strengthening competitive leadership in an era of rapid technological change and increasingly unpredictable challenges, including geopolitical crises such as the Russian Federation's military aggression against Ukraine.

The practical implementation of the open innovation concept has demonstrated the necessity of systematically integrating knowledge management and talent management into the organization's overall management system. This integration requires the development of a new generation of managerial competencies that combine deep domain expertise with a broad

interdisciplinary perspective, enabling effective communication, collaboration, and knowledge exchange across organizational boundaries.

Further research into these managerial competencies is essential for enhancing workforce mobility through enterprise knowledge and talent platforms, as well as for optimizing cross-functional teams that support the implementation of open innovation projects.

At the same time, priority should be given to developing socio-cultural mechanisms – such as trust, shared norms of interaction, a common language, empathy, and psychological safety – as they constitute the social foundation of effective collaboration. Without these mechanisms, even the most promising innovative idea is unlikely to be successfully implemented, regardless of the organization's absorptive capacity.

Future research should also focus on the development of quantitative approaches for assessing the socio-economic effectiveness of knowledge management and talent management practices within the context of open innovation initiatives. Such research is of particular importance for Ukraine's post-war recovery and its integration into European and global models of innovation-driven development and competitive leadership.

References

1. Chesbrough, Henry W. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press, 2003.
2. Chesbrough, Henry W., et al. *Open Innovation: Researching a New Paradigm.* Oxford UP, 2006.
3. "IDC Spending Guide Sees Worldwide Digital Transformation Investments Reaching $3.4 Trillion in 2026." *International Data Corporation*, 2022, www.businesswire.com/news/home/20221026005193/en/.
4. "IDC: Global ICT Spend to Reach $4 Trillion in 2026." *Channel Impact*, 2026, www.channel-impact.com/idc-global-ict-spend-to-reach-4-trillion-in-2026/. Accessed 26 April 2026
5. Chesbrough, Henry W. "The Era of Open Innovation." *MIT Sloan Management Review*, vol. 44, no. 3, 2003, pp. 35–41. sloanreview.mit.edu/article/the-era-of-open-innovation/.
6. West, Joel, and Scott Gallagher. "Challenges of Open Innovation: The Paradox of Firm Investment in Open-Source Software." *R&D Management*, vol. 36, no. 3, 2006, pp. 319–331, doi:10.1111/j.1467-9310.2006.00436.x.
7. Enkel, Ellen, et al. "Open R&D and Open Innovation: Exploring the Phenomenon." *R&D Management*, vol. 39, no. 4, 2009, pp. 311–316, doi:10.1111/j.1467-9310.2009.00570.x.
8. Vanhaverbeke, Wim. "The Interorganizational Context of Open Innovation." *Open Innovation: Researching a New Paradigm*, Oxford UP, 2006, pp. 205–219.
9. Cohen, Wesley M., and Daniel A. Levinthal. "Absorptive Capacity: A New Perspective on Learning and Innovation." *Administrative Science Quarterly*, vol. 35, no. 1, 1990, pp. 128–152, doi:10.2307/2393553.
10. Zahra, Shaker A., and Gerard George. "Absorptive Capacity: A Review, Reconceptualization, and Extension." *Academy of Management Review*, vol. 27, no. 2, 2002, pp. 185–203, doi:10.5465/amr.2002.6587995.
11. "Internal Organization and Absorptive Capacity in Open Innovation Contexts: The Roles of Gatekeeping, Task Specialization, and Delegation." *Industrial and Corporate Change*, 2025, academic.oup.com/icc/advance-article/doi/10.1093/icc/dtaf018/8131777. Accessed 26 April 2026
12. "Managing Knowledge Flows within Open Innovation: Knowledge Sharing and Absorption Mechanisms in Collaborative Innovation." *Cogent Business & Management*, 2024, www.tandfonline.com/doi/full/10.1080/23311975.2024.2351832.Beretta, Marco, et al. *"Lego Takes Customers' Innovations Further."* MIT Sloan Management Review, 2023, sloanreview.mit.edu/article/lego-takes-customers-innovations-further/. Accessed 26 April 2026
13. Chiaroni, Davide, et al. "The Open Innovation Journey: How Firms Dynamically Implement the Emerging Innovation Management Paradigm." *Technovation*, vol. 31, no. 1, 2011, pp. 34–43, doi:10.1016/j.technovation.2009.08.007.
14. Drechsler, Wencke, and Martin Natter. "Open Innovation in Nonhigh-Tech Companies." *R&D Management*, vol. 42, no. 4, 2012, pp. 322–336, doi:10.1111/j.1467-9310.2012.00681.x.
15. Chesbrough, Henry W., and Marcel Bogers. "Explicating Open Innovation: Clarifying an Emerging Paradigm for Understanding Innovation." *New Frontiers in Open Innovation*, Oxford UP, 2014, pp. 3–28.

16. Bogers, Marcel, et al. “Open Innovation: Research, Practices, and Policies.” *California Management Review*, vol. 60, no. 2, 2018, pp. 5–16, doi:10.1177/0008125617745086.
17. “The Open Talent Economy.” *Deloitte Insights, Deloitte Review*, issue 13, Deloitte, www2.deloitte.com/xe/en/insights/deloitte-review/issue-13/the-open-talent-economy.html. Accessed 26 April 2026
18. Panchenko, Yevhen H., and Maryna Ye. Kyriakova. “The Concept of Open Innovation and Its Use by Transnational Corporations in Ukraine.” *Strategy of Ukraine’s Development*, no. 4, 2013, pp. 173–179. jrnl.nau.edu.ua/index.php/SR/article/view/6845. Accessed 26 April 2026
19. Fedulova, Liubov I., and Olha S. Marchenko. “Innovation Ecosystems: Essence and Methodological Foundations of Formation.” *Economic Theory and Law*, no. 2 (21), 2015, pp. 21–33.
20. Fedulova, Liubov I. *Technological Policy: Global Context and Ukrainian Practice.* Kyiv National University of Trade and Economics, 2015.
21. Pidorycheva, Iryna Yu. “European Integration of Ukraine in the Field of Research and Innovation: State, Challenges, Acceleration Measures.” *Journal of European Economy*, vol. 20, no. 4 (79), 2021, pp. 710–731.
22. Pidorycheva, Iryna Yu. “Smart Specialization and Innovation Ecosystems: European Experience and Opportunities for Ukraine.” *Economy of Ukraine*, no. 6, 2022, pp. 52–74.
23. Pidorycheva, Iryna Yu. *European Research Area and Innovative Development of Ukraine.* National Academy of Sciences of Ukraine, Institute of Industrial Economics, 2024.
24. Nosyk, Oleksandr M. “Open Innovation Systems: Main Characteristics and Directions of Internationalization.” *Bulletin of Dnipropetrovsk University. Series: Innovation Management*, no. 6, 2016, pp. 103–113.
25. Parubets, Svitlana. “Fragmentation of the National Innovation System of Ukraine in the Context of Globalization.” *Economy and Society*, no. 84, 2026, doi.org/10.32782/2524-0072/2026-84-66.
26. “Digital Transformation Statistics for 2026.” *Backlinko*, 2026, backlinko.com/digital-transformation-stats.
27. “Top 100 Game-Changing Digital Transformation Statistics.” *Quixy*, 2025, quixy.com/blog/top-digital-transformation-statistics-trends/. Accessed 26 April 2026
28. Vial, Gregory. “Understanding Digital Transformation: A Review and a Research Agenda.” *The Journal of Strategic Information Systems*, vol. 28, 2019, pp. 118–144, doi:10.1016/j.jsis.2019.01.003.
29. “Open Innovation.” *Wikipedia*, Wikimedia Foundation, en.wikipedia.org/wiki/Open_innovation.
30. Nonaka, Ikujiro, and Hirotaka Takeuchi. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation.* Oxford UP, 1995.
31. “Open Innovation: Are Absorptive and Desorptive Capabilities Complementary?” *ScienceDirect*, www.sciencedirect.com/science/article/abs/pii/S096959312100072X. Accessed 26 April 2026
32. “NASA Space Apps Challenge 2025.” *NASA*, 2025, www.nasa.gov/nasa-space-apps-challenge-2025/.
33. Tyukhtenko, Nataliya A. “Managerial Culture as a Factor of Enterprise Development under Modern Challenges and Global Changes.” *Current Problems of Regional Economic Development*, vol. 2, no. 19, 2023, pp. 168–177, doi:10.15330/apred.2.19.168-177.
34. Tyukhtenko, Nataliya A. “Management of Competitiveness in the Innovation Strategy of an Enterprise.” *Economic Synergy*, no. 4 (6), 2022, pp. 118–128, doi:10.53920/es-2022-4-9.
35. Tyukhtenko, Nataliya. “Competence Aspects of Human Resource Management in the Context of Global Trends in the Intellectual Development of Business Ecosystems.” *Scientific Bulletin of Ivano-Frankivsk National Technical University of Oil and Gas (Economics and Management in the Oil and Gas Industry Series)*, no. 1 (31), 2025, pp. 128–139, doi:10.31471/2409-0948-2025-1(31)-128-139.
36. Beretta, Marco, et al. *“Lego Takes Customers’ Innovations Further.”* MIT Sloan Management Review, 2023, sloanreview.mit.edu/article/lego-takes-customers-innovations-further/. Accessed 26 April 2026

Submission date: 29.06.2026
Date of acceptance for publication: 12.07.2026