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MANAGEMENT OF INNOVATIVE DEVELOPMENT OF EDUCATION IN THE CONTEXT OF GLOBALIZATION CHALLENGES

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ABSTRACT

The current stage of development of world civilization is characterized by unprecedented dynamics of changes caused by processes of globalization, integration and deployment of the Fourth Industrial Revolution. In these conditions, education ceases to be simply an institution for knowledge transfer; it turns into a strategic resource of national security, a driver of economic growth and the main tool for forming human capital of the new generation. Globalization challenges, supplemented for Ukraine by complex crisis and security realities, require a radical rethinking of approaches to managing educational systems at all levels. The need for flexible, anti-crisis, innovative management, capable of transforming challenges into new opportunities, comes to the fore.

The proposed collective monograph is the result of a systematic scientific search of the author team, united by a common goal – to substantiate the theoretical and methodological principles and practical tools for managing the innovative development of education in the era of global changes. The logic of the research is built around four fundamental blocks that comprehensively cover the macro-, meso- and micro-levels of educational management.

The first block is devoted to the study of the problem «Global trends as a catalyst for innovative development of education». The author analyzes global megatrends – digitalization, internationalization of the scientific and educational space, the concept of lifelong learning and the development of ecosystem thinking. In this context, global transformations are considered not only as external constraints, but as a powerful incentive for internal qualitative renewal of domestic education, optimization of its structure and increasing competitiveness in the international arena.

The second block of the study focuses on the issue of «Modernization of the management of educational institutions in the context of European integration». Ukraine's European choice requires harmonization of the national education system with the principles and standards of the European Higher Education Area. The section examines in detail the mechanisms for adapting the European competence

framework, implementing flexible learning trajectories, expanding the autonomy of educational institutions, and creating effective internal quality assurance systems, which is critically important for the successful integration of domestic institutions into the international scientific community.

The third block reveals «Transformation of communication management in education: from traditional models to digital smart partnership». Modern management architecture is impossible without rethinking information flows. The author justifies the need to abandon rigid vertical (hierarchical) communications in favor of networked, horizontal interactions. The concept of «smart partnership» is considered as an innovative model of synergistic interaction between educational institutions, the state, business and civil society, based on the use of modern digital platforms and an ecosystem approach.

The fourth, final block logically complements the communicative issues and explores «Digital communicative culture as a factor in ensuring sustainable development and intelligent partnership in innovative management of education». The effectiveness of digital tools and technologies (including artificial intelligence systems) directly depends on the level of culture of their use. The section analyzes the ethical, psychological, pedagogical and organizational aspects of the formation of the digital culture of participants in the educational process, defining it as a basic condition for ensuring academic integrity, security of the educational environment and sustainable long-term development of the entire management system.

The authors express the hope that the presented monograph will become a useful basis for developing strategic decisions in the field of educational policy, and the proposed recommendations will find their practical application in the activities of heads of educational institutions, scientists, postgraduate students and all those who ensure the innovative progress of modern Ukrainian education.

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1. Global trends as catalyst for innovative educational development

The current stage of civilization development is characterized by the rapid intensification of globalization processes, which act as a powerful catalyst for systemic transformations in all spheres of social life, and primarily in education. The dynamic progress of information technologies, the formation of a knowledge economy and the emergence of new geopolitical shifts require educational systems to have a higher level of adaptability and a proactive nature of development. Traditional approaches to the administration of educational institutions are gradually losing their effectiveness, giving way to new management paradigms capable of ensuring integration into a single European and global educational space. However, today this process is unfolding in conditions of unprecedented geopolitical turbulence and a large-scale security crisis in Eastern Europe. The full-scale war in Ukraine, the prolonged aggression by the russian federation and the associated destruction of infrastructure, the forced migration of millions of participants in the educational process and the shortage of resources have radically changed the conditions for the functioning of educational institutions. In this context, the management of innovative development of education ceases to be a purely modernization tool, but turns into a strategic mechanism for ensuring national security, preserving the intellectual potential of the state, and forming social sustainability.

Despite a significant body of scientific work in the field of educational management, theoretical, methodological and applied aspects of innovation management in conditions of martial law and post-war reconstruction require further deep rethinking. The issues of preserving the unified educational space of Ukraine, the reintegration of education seekers from deoccupied territories, as well as overcoming educational losses caused by the destruction of institutions and constant security threats are becoming particularly acute. A model of flexible combination of distance and blended learning, taking into account the challenges of cybersecurity and information countermeasures in conditions of hybrid war, is needed. The

mechanisms of adaptation of domestic educational institutions to European standards in the status of a candidate and future member of the European Union remain insufficiently studied, which requires accelerated harmonization of legislation, the development of academic mobility and the attraction of international grant investments for reconstruction. There is an objective need for a comprehensive study that would combine the analysis of global megatrends with the development of specific anti-crisis management models.

The purpose of the study is a comprehensive theoretical generalization and justification of strategic guidelines, mechanisms and technologies for managing the innovative development of education in the context of modern globalization and geopolitical challenges. The object of the study is the process of functioning and development of educational systems in conditions of geopolitical turbulence, and the subject is the theoretical, methodological and practical principles of managing this development on innovative and security principles.

The study of the architecture of modern education requires a systematic analysis of the external environment in which educational institutions function and develop. At the beginning of the 21st century, traditional educational models faced a complex of powerful external factors that act as unalternative factors for their radical modernization. Global trends – from large-scale digitalization and integration of artificial intelligence to geopolitical shifts and security crises – are no longer autonomous phenomena, but act as synergistic catalysts that accelerate the diffusion of innovations in educational management. Educational management in these conditions loses the features of classical linear administration, transforming into a dynamic process of strategic anticipation, where the system's ability to adapt to global megatrends determines its national viability and international competitiveness.

Analysis of transformation processes in the global scientific and educational space shows that the architecture of modern educational systems is formed under the direct and severe influence of the system of megatrends - large-scale, long-term and global vectors of development that determine the vector of evolution of human civilization. In the scientific discourse of educational management, these megatrends

are considered not simply as external conditions of functioning, but as primary determinants that require changes in the very essence of the educational process, its goals, structure and management methods. A key place among them is occupied by the formation of a post-industrial society and the transition to a knowledge economy, where intellectual capital and the ability to continuous learning (Lifelong Learning) become the main factors of geopolitical and economic leadership of states. As a result, the classical closed model of education, focused on the transmission of a fixed amount of knowledge, loses its relevance, giving way to open, flexible and innovative ecosystems. This conceptual shift correlates with the fundamental provisions of the evolutionary economic theory of J. Schumpeter, who interpreted innovation as a process of «creative destruction» of outdated forms [19], as well as with the sociological concept of M. Castells regarding the formation of a network society [21]. Within the framework of such an approach, also substantiated in the works of P. Drucker on the «knowledge society» [23], the management vertical in education is inevitably transformed from a rigid hierarchical system into a flexible heterarchical network, where information and knowledge flows become the key object of management.

To systematize the systemic pressure of the external environment on the functioning of the educational space, it is advisable to summarize the key megatrends of modernity through the prism of their specific determining influence on management processes (Table 1). The presented matrix illustrates the cause-and-effect relationship between global civilizational changes and the need to reconfigure the internal elements of educational management – from changing target guidelines to decentralizing management functions.

The determinant matrix visualized in Table 1 shows that none of the modern megatrends operates in isolation; they form a complex synergistic system of pressure on education management. The transition to a knowledge economy in combination with Industry 4.0 creates the effect of «anticipatory renewal», when classical forms of planning and fixed educational standards lose their relevance even at the stage of their approval. Of particular interest is the fact that for the domestic educational space

the security trend has now become a cross-cutting one. It forces the integration of anti-crisis management tools into each of the other areas: from protecting digital data in cyberwar to preserving human capital in conditions of mass migration.

Table 1 – The impact of global megatrends on the architecture and management of educational systems

Megatrend name	Essence of the global challenge	Determinative impact on education management / Change in management paradigm
The emergence of the knowledge economy	Rapid depreciation of fixed information, priority of intellectual capital	Transition to the concept of Lifelong Learning; management of the institution as an open hub of continuous development
Digitalization and Industry 4.0	Dominance of AI, Big Data, automation of professions, emergence of new labor markets	Implementation of data-driven management; development of flexible individual learning trajectories; digital didactics
Demographic and sociocultural shifts	Aging population (in the EU), mass migration flows, demand for equality	Focus on inclusive management, ensuring barrier-free and cross-cultural adaptation of applicants
Greening and sustainable development	Climate crises, resource depletion, orientation towards UN Goals (SDG 4)	Integration of the principles of "green" management, formation of social responsibility and eco-thinking in organizational culture
Geopolitical turbulence and security crises	Military conflicts (in particular the war in Ukraine), cybersecurity threats, destruction of infrastructure	Transition to crisis management and resilience management; minimization of «educational losses»; organization of safe blended learning

Source: formed and systematized by the author based on the analysis of conceptual reports of the World Economic Forum (WEF) [31], OECD projects (OECD Future of Education and Skills 2030) [28] and UNESCO Global Strategy «Education 2030» [24]

Thus, generalized challenges require leaders at all levels to abandon reactive administration and move towards designing flexible, adaptive systems capable of withstanding external shocks without losing the quality of the educational product.

Among the technological determinants, the dominant importance is given to the fourth industrial revolution (Industry 4.0) and the total digitalization associated with it. The rapid penetration of artificial intelligence systems, big data technologies (Big Data), cloud computing and immersive technologies (VR/AR) into public life is radically changing the labor market demand for professional competencies. This creates a situation of ahead updating of requirements for specialists, when

educational institutions are forced to prepare applicants for professions that do not yet exist and work with technologies that are only being developed. The specified technological vector requires education management to focus on the global standards of «Education 4.0», recorded in the reports of the World Economic Forum (WEF) [31]. According to these analytical parameters, the development of cross-functional skills in applicants becomes a priority: systemic and analytical thinking, cognitive flexibility and technological literacy. In parallel, there is a need to intensify the digital development of educators themselves based on the European competence framework, in particular the European DigCompEdu model [29], which defines the criteria for a teacher's ability to design digital learning environments. For educational management, this megatrend means the need for a deep reconfiguration of the internal environment of educational institutions: from the automation of routine management functions to the creation of intelligent systems for monitoring the quality of education and the formation of individual educational trajectories. Technologization acts as a catalyst for the decentralization and virtualization of the educational space, destroying the traditional spatio-temporal boundaries of learning.

Along with technological factors, the architecture of educational systems is under significant pressure from demographic, socio-cultural and environmental trends. The processes of population aging in developed countries, increased migration flows and global integration of labor markets actualize the task of ensuring inclusiveness, barrier-free and cross-cultural adaptability of education. These processes are normatively regulated and directed by leading international institutions within the framework of the UNESCO Global Strategy «Education 2030», which determines the implementation of the Fourth Sustainable Development Goal (SDG 4) on ensuring inclusive and equitable quality education [24]. In addition, analytical reports of the Organization for Economic Cooperation and Development (OECD), in particular within the framework of the project «The Future of Education and Skills 2030», emphasize the transition from purely economic pragmatism in education to the formation of the personal potential (agency) of the applicant, the ability to act responsibly in the face of environmental and social challenges [28]. At the same time,

the growth of environmental threats and the orientation of the world community to the UN Sustainable Development Goals require educational management to integrate the principles of «green» thinking and social responsibility into the development strategy of educational institutions. Education in the context of these challenges is transformed into a leading tool for the formation of a new civilizational consciousness capable of ensuring the harmonious coexistence of humanity in conditions of limited resources.

The impact of global megatrends acquires a special specificity in countries that are at the epicenter of geopolitical shifts and security crises. For modern Ukraine, the determining influence of globalization processes is superimposed on the existential challenges of full-scale military aggression. In these coordinates, the security megatrend becomes decisive for the architecture of national education, requiring managers to immediately implement anti-crisis models, ensure cybersecurity, and preserve human capital in conditions of mass depopulation and external migration.

Empirical confirmation of the critical impact of security and demographic megatrends on the architecture of the domestic educational space is the dynamics of the rapid reduction in the contingent of applicants (Table 2). Statistical indicators clearly demonstrate the scale of demographic pressure, which determines the need for immediate optimization and adaptation of management models.

The analysis of empirical data in Table 2 demonstrates the depth of the crisis: over the past year alone, the system has lost about 250 thousand students. However, the most alarming prognostic marker for educational management is the drop in the number of first-graders in 2025/2026 academic year by 62 thousand people (or 19,7%). This indicates the long-term nature of depopulation and poses new challenges for managers regarding the forced reformatting and enlargement of the network of institutions, the deficit of funding according to the principle of «money follows the student» and the need to retain teaching staff in conditions of market narrowing.

Table 2 – Dynamics of the number of students in general secondary education institutions of Ukraine under martial law, 2021–2026

Academic year	Total number of students in Ukraine, million people	Dynamics compared to the previous year	Number of first-graders, thousand people	Number of schoolchildren abroad, thousand people
2021 / 2022	4,18	+ 0,9%	400,0	–
2022 / 2023	4,00	– 4,3%	325,0	~ 500,0
2023 / 2024	3,86	– 3,5%	314,0	~ 400,0
2024 / 2025	3,75	– 2,8%	314,0	345,0
2025 / 2026	3,50	– 6,6%	252,0	> 300,0

Source: developed and compiled by the author independently based on official statistical reports of the Ministry of Education and Science of Ukraine [4] and analytics of the Institute of Educational Analytics [3] for 2021–2026

Management practice in the domestic educational space today is forced to operate with the categories of «learning loss» and «learning gaps», according to the World Bank methodology, which arose as a result of the destruction of infrastructure and forced interruptions in education [8]. The infrastructural dimension of the security megatrend is characterized by unprecedented scales of physical destruction and damage to the material and technical base of institutions, which is recorded in consolidated monitoring reports (Table 3).

The presented statistics (Table 3) illustrate that almost 5 thousand educational infrastructure facilities have been subjected to destructive impact. For innovative management, these figures mean a transition to the paradigm of «recovery management» and «design of safe spaces». Physical damage to more than 4 thousand buildings has led to chronic «learning loss», as a significant part of schools in frontline regions (up to 49% according to the savED fund) are forced to operate exclusively in online mode. This requires leaders to implement «underground school» systems, flexible digitalization and the use of data-driven approaches to compensate for gaps in students' knowledge.

Table 3 – State and extent of destruction of Ukraine's educational infrastructure, as of the first half of 2026

Level / Type of educational institutions	Damaged facilities (suffered destruction)	Completely destroyed (totally destroyed)	Total number of affected facilities
General secondary and preschool education	~ 3200	~ 380	~ 3580
Vocational and technical education	182	12	194
Higher and professional pre-higher education	153 (Higher education buildings)	3 (university buildings)	156
Other (out-of-school, special institutions)	~ 558	~ 17	~ 575
Total in the education system	4093	412	4505

Source: compiled by the author based on official consolidated data of the Ministry of Education and Science of Ukraine (statement of Minister O. Lisovy, June 2026) [4] and the State Educational Portal Save Schools [1]

The geopolitical crisis has provoked the phenomenon of the so-called «forced internationalization» – a mass outflow of education seekers and scientific and pedagogical personnel abroad, which creates a threat of devaluation of the country's intellectual potential [2; 11]. Accordingly, the task of innovation management is not only adaptation to current conditions, but also the development of proactive strategies for the reintegration of human capital in the post-war period. Thus, global megatrends act as complex, interconnected forces that destroy conservative educational structures and at the same time open up wide opportunities for designing adaptive, sustainable and innovative management systems that can effectively respond to the challenges of the modern era of turbulence.

Assessment of the determining influence of modern challenges allows us to state the inconsistency of classical management tools with new civilizational realities. For a deeper understanding of the essence of innovative shifts, a comparative analysis of the traditional (hierarchical) and the latest (innovative-advanced) models of management of educational systems was conducted (Table 4). The presented comparison criteria clearly demonstrate the vector of management evolution from rigid administration to the design of adaptive educational ecosystems.

Table 4 – Comparative characteristics of traditional and innovative-advanced models of educational management

Comparison criterion	Traditional (technocratic) model	Innovative and proactive (ecosystem) model
Nature of management	Reactive (responding to changes that have already occurred or are coming down from above)	Proactive and proactive (forecasting and designing future trends)
Structure of relationships	Rigid vertical hierarchy, linear administration	Flexible heterarchical network, ecosystem interaction (Triple Helix model)
Key reference point	System stability, implementation of regulatory plans and standards of the past	Dynamic development, constant adaptation, diffusion of innovations, high viability
Role of the manager	Administrator-controller, executor of directives of higher authorities	Strategic leader, change facilitator, manager of innovative potential
Technological basis	Predominantly paper-based document flow, local information bases	End-to-end digitalization, cloud services, intelligent Big Data analytics systems
Attitude towards risks	Risk avoidance, conservatism, resistance to innovations	Risk management, perception of uncertainty as an opportunity zone

Source: author's development based on the integration of J. Schumpeter's evolutionary theory of innovation [19], M. Castells' concept of network society [21] and G. Itzkowitz's Triple Helix model [25]

The comparative analysis (Table 4) clearly illustrates the depth of the paradigmatic gap between the traditional technocratic approach and the requirements of the modern era of turbulence. If the classical model was effective in conditions of relative stability and predictability of the labor market, then in conditions of globalization pressure it demonstrates rigidity and high resistance to change. The innovative-advanced model, on the contrary, is based on the principles of ecosystemism, where risks are perceived not as a threat, but as an impulse for development, and leadership is transformed from directive to facilitative. Management of an educational institution as an open ecosystem allows for the prompt reconfiguration of internal resources, the implementation of digital technologies of data analytics and the minimization of educational losses. In general, the fixed vector of evolution from a rigid hierarchy to a flexible heterarchical network creates objective prerequisites for a deeper theoretical rethinking of the very conceptual dimensions of innovation management.

Thus, the complex pressure of global megatrends and security imperatives of today demonstrates the exhaustion of the potential of traditional administration. The fixed vector of evolution from a rigid hierarchy to a flexible heterarchical network creates objective prerequisites for a deeper theoretical rethinking of the very conceptual dimensions of innovation management. This actualizes the need for a detailed study of paradigm shifts, categorical and conceptual apparatus and theoretical and methodological principles that determine the essence and specificity of managing the innovative development of modern educational systems.

Rethinking management practice in the context of geopolitical and technological turbulence requires, first of all, a clear explication and decomposition of the categorical and conceptual apparatus that serves the sphere of innovative management in education. For a long time, the scientific discourse was dominated by an approach in which the concept of «innovation in education» was reduced exclusively to the pedagogical or didactic aspect – the emergence of new teaching or upbringing methods. However, the modern evolution of educational systems proves that innovative development is a complex phenomenon that encompasses at least three interrelated dimensions: technological (instrumental), pedagogical (content-processual) and managerial (institutional-managerial) [6]. At the same time, it is managerial innovations – that is, the introduction of new leadership models, flexible organizational structures, financing methods and data-driven management tools – that act as an integrative basis and the main condition for the success of all other transformations.

Within the outlined three-dimensional space, there is an objective need for demarcation and categorical differentiation of related, but not identical, definitions that constitute the core of the conceptual apparatus of the study.

First of all, «innovation in education» is interpreted as a broad, macrosystemic process of modernization of the educational sphere as a whole, which is determined by globalization challenges and accompanied by changes in fundamental educational paradigms and state policy.

Instead, the term «educational innovation» has a more local, instrumental nature and is localized at the level of the direct educational process in a specific institution. It reflects the end result of the introduction of new content elements, progressive didactic methods, digital platforms or artificial intelligence tools, which leads to a qualitative increase in the level of competencies of applicants.

The category of «managerial innovation in education» deserves special attention, which can be defined as a purposeful change in the structure, functions, methods, technologies and decision-making mechanisms in the management system of an educational entity. Managerial innovation is aimed at optimizing internal resources, transforming organizational culture and transitioning from reproductive administration to strategic leadership in conditions of high uncertainty. Managerial innovation occupies a dominant, meta-oriented place: it acts as an institutional and organizational framework that launches, provides resources and legitimizes the diffusion of all other educational innovations. Without systemic changes in management methodology, any attempts at technological or pedagogical modernization are doomed to fragmentation and rapid extinction under the pressure of the institution's bureaucratic inertia.

For a deeper differentiation of the essence of these transformations and a detailed description of the role repertoire of a modern manager, it is advisable to compare the key vectors of activity of a classical manager and a leader of innovative changes (Table 5).

The conducted in-depth comparative analysis of role profiles (Table 5) shows that the paradigm shift in the field of educational management lies not so much in the plane of changing technological tools, but in the dimension of a deep mental and value reconfiguration of the manager's personality. The contrast between the «Administrator-Functionist» and the «Transformational Leader» clearly demarcates the boundary between the reproductive models of the past and the forward-looking strategies of the future.

Table 5 – Comparative analysis of role profiles of the head of an educational institution in the context of a paradigm shift

Comparison parameters	Administrator-functionary (Traditional paradigm)	Transformational leader (Innovation paradigm)
Basic management vision	Conservation of the existing state (Status Quo), stable functioning	Designing the future, initiating change, proactive development
Attitude towards subordinates	Personnel as a tool for implementing directives, strict subordination	Team as intellectual capital, delegation of authority (empowerment)
Communication strategy	Vertical, monological, limited by official document flow	Networked, dialogic, built on facilitation and feedback
Motivational tools	External control, reprimand system, administrative incentives	Intrinsic motivation, creating a shared vision, talent management
Management decision-making	Purely intuitive or template (according to the instructions of the past)	Based on big data analysis (data-driven), AI analytics and forecasting
Culture of attitude towards mistakes	Mistake as a fault subject to punishment and fixation	Mistake as experience (growth mindset), a tool for correcting the innovation path

Source: formed by the author independently based on the integration of the concepts of change leadership by M. Fullan [26] and the theory of emotional intelligence in management

The key difference is fixed in the vector of the basic management vision. If the traditional approach is focused on the rigid conservation of the existing state (Status Quo), where any innovation is perceived as a destabilizing deviation, then transformational leadership determines the perception of changes as a natural state of functioning of an open system. A new type of leader shifts the emphasis from total control over compliance with formalized procedures to managing the internal potential of the organization. The institution's staff is no longer considered as a set of directive executors; it is transformed into intellectual capital, the development of which is stimulated through the tools of delegation of authority (empowerment) and the construction of flexible heterarchical relationships.

Of particular interest is the dichotomy in the culture of attitude to risks and errors. In the administrative-technocratic model, a subordinate's mistake is treated as an official misconduct, which leads to the destructive suppression of any grassroots initiative. In the innovative management paradigm, the concept of growth mindset is introduced, where the error is a natural element of experimental testing of

hypotheses, a unique experience and a tool for correcting the institution's innovative path.

In addition, the technological basis of decision-making of a transformational leader is completely based on the principles of data-driven management. The use of intelligent big data analysis systems and predictive artificial intelligence algorithms allows minimizing subjectivism and intuitive errors inherent in traditional administration. Thus, the generalized criteria prove that the successful diffusion of innovations into the educational environment is possible only if the leader overcomes internal conservative resistance and his transition to the philosophy of proactive, value-oriented leadership, capable of consolidating the team around a long-term development strategy.

Systematic explication of paradigm shifts in educational management requires taking into account not only the driving forces, but also the factors of resistance that arise in the process of diffusion of innovations. The introduction of managerial and educational innovations inevitably encounters the phenomenon of institutional and psychological resistance, which in the scientific literature is classified as a system of innovation barriers. The conservative architecture of educational entities tends to maintain a state of homeostasis, due to which any impulse to modernization causes a reaction of rejection at different levels of the organizational structure. It is advisable to distinguish three key groups of innovation barriers that minimize the effectiveness of transformation processes: subjective-psychological, organizational-managerial, and resource-infrastructural.

Subjective-psychological barriers manifest themselves in the form of «technological anxiety» of educators, fear of losing professional authority in the context of digitalization and the use of artificial intelligence, as well as in stereotyping of thinking («syndrome of rejection of other people's experience»). Organizational and managerial barriers are caused by excessive bureaucracy and duplication of reporting procedures, which absorb teachers' time resources, as well as a lack of effective mechanisms for material and moral motivation for innovative activities. Resource and infrastructure barriers are associated with uneven access to

high-speed digital tools and a shortage of targeted funding for experimental sites, which is significantly exacerbated in times of security crisis.

Overcoming these destructive factors is directly entrusted to the transformational leader and is implemented through mechanisms of reflective and participatory management. Participation, as a tool for involving all participants in the educational process in joint decision-making and designing the institution's strategy, allows you to convert individual resistance into collective responsibility. The creation of flexible psychological support zones, the continuous development of digital competencies and the transformation of organizational culture in the direction of growth mindset allow you to level barriers, turning the potential of resistance into an internal resource of innovative progress.

Paradigmatic shifts in the management of educational innovations are directly related to the change in basic methodological approaches. The classical classical-technocratic (process) approach, based on the principles of Taylorism and strict control, is being replaced by a synergistic approach. From the standpoint of synergetics, a modern educational institution is considered as a complex, open, nonlinear system that is in a state of permanent exchange of information, human and material resources with the external environment. Management of such a system in the era of global challenges cannot be based on directive forecasts and rigid long-term plans. Management is transformed into a process of reflexive management, where the key task of the manager is not to suppress fluctuations and deviations, but to create conditions for self-organization, initiate internal sources of development and design an adaptive innovative environment.

An important element of the modern management paradigm is the ecosystem approach, which fundamentally changes the idea of the boundaries and interaction of subjects of the educational space. An educational organization ceases to be an isolated institution, and is transformed into a dynamic ecosystem integrated into the regional and global context. The methodological basis of such interaction is the concept of the «Triple Helix» by G. Itskowitz, which in the conditions of the knowledge economy has transformed into the «Quadruple Helix» model, combining

the efforts of four key macro-subjects: universities (education and science), business (labor market), the state (represented by authorities) and civil society [25]. In such a configuration, innovative development management consists in facilitating network connections and creating consortia capable of promptly responding to the demands of society and industry, while minimizing the risks of educational and intellectual losses. The innovative architecture of such inter-subjective interaction within the ecosystem approach takes on a clearly structured form within the spatial model of knowledge and technology transfer (Fig. 1).

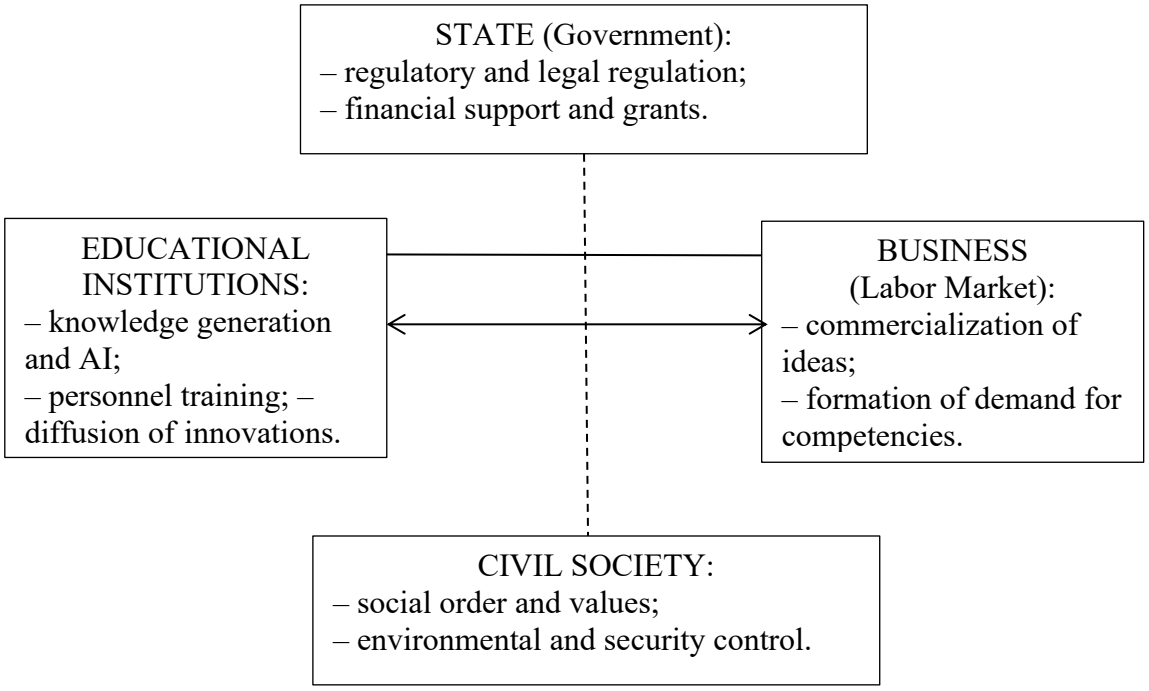

Figure 1 – Quadruple Helix model in managing innovative development of education

Source: developed by the author based on a modification of the «Quadruple Helix» concept by E. Karayannis and D. Campbell [20]

A detailed explicative analysis of the presented architecture of interaction (Figure 1) allows us to assert that in the conditions of modern globalization challenges, the innovative development of educational systems loses signs of autonomy or linear isolationism. The transformation of the classical three-component model of G. Itskowitz into the format of the «Quadruple Helix» is due to the emergence of a new strategic actor – civil society, which acts not just as a passive

consumer of educational services, but as the primary customer of the value and security parameters of education.

In this configuration, each of the four vectors of the spiral is in a state of constant dynamic interference. Educational institutions (universities, colleges, schools) perform the function of the basic intellectual core, where direct knowledge generation, testing of digital technologies and training of adaptive human capital take place. However, the trajectory of this training is determined by impulses from business and the real sector of the economy, which transmit in advance the current requests for the matrix of necessary competencies, minimizing the risks of structural unemployment and technological lag.

The role of the state vector within this model undergoes a significant evolution: from directive command, authorities move to service-partner functioning. The state provides the innovation ecosystem with flexible regulatory and legal regulation (in particular, mechanisms for academic and financial autonomy of institutions) and financial stimulation tools (grant support, targeted subsidies, tax preferences for innovators).

Of particular importance is the cross-cutting connection between innovative entities and civil society, which is clearly visible in the conditions of modern geopolitical and security pressure in Ukraine. Society puts forward strict requirements for the resilience of the educational space, inclusiveness and mental safety. As a result, effective management of innovative development does not consist in the administration of a separate institution, but in the facilitation and synchronization of all four flows of the spiral, which allows converting theoretical knowledge into real socio-economic preferences and ensuring the national stability of the state.

The transformation of methodological principles leads to a fundamental change in the role repertoire of the head of an educational organization. The traditional figure of the «director-administrator» or «rector-manager», whose activities were focused on the reproductive implementation of regulatory directives and the maintenance of the material fund, is finally losing its effectiveness. Modern challenges require the formation of the phenomenon of strategic and transformational leadership [26]. A

transformational leader in education is a subject capable of forming a common visionary vision of the development of the organization, overcoming psychological resistance to innovations from the team, acting as the main manager of innovative potential and designing an organizational culture based on the values of academic integrity, creativity and resilience. Thus, the paradigm shift consists in the transition from the administration of functioning processes to strategic leadership in the processes of advanced innovative development.

Thus, the conceptual dimensions of the modern management paradigm require educational entities to form flexible ecosystem connections and overcome internal innovation barriers on the basis of transformational leadership. At the same time, the successful internal development of domestic educational systems cannot occur in isolation from the global institutional framework. This necessitates the synchronization of internal innovation processes with global regulatory requirements and international quality standards. The specified vector actualizes the need for a systemic analysis of global benchmarks and European integration imperatives, which directly determine the trajectory of modernization of the national educational space.

The deep modernization of the domestic educational space in the context of Ukraine's European integration aspirations actualizes the need for a detailed analysis and practical implementation of the key principles of the Bologna Process and regulatory standards of the European Union. The creation and continuous development of the European Higher Education Area (EHEA) have defined a new architecture of educational systems, where student-centered learning is the fundamental guideline. This approach fundamentally changes the traditional subject-object paradigm of interaction in the educational process, transforming the student into an active participant in the formation of his own educational trajectory, which requires management to be flexible in developing individual curricula and diversifying teaching methods. The technological tool for implementing this principle and ensuring academic mobility is the European Credit Transfer System (ECTS), which, through unified accounting of the educational load and clear formulation of learning outcomes, ensures transparency, comparability and convertibility of

educational programs in the international dimension. The current stage of the EHEA development, determined by the provisions of the Rome Communiqué, brings to the fore a triad of interrelated priorities, among which a special place is occupied by inclusiveness, innovation and interconnectedness of educational systems. The depth and systemic nature of these transformations, which necessitate a radical rethinking of management approaches, can be demonstrated through a comparative analysis of the key criteria of classical and modern European integration models of educational management (Table 6).

Table 6 – Paradigm shift in education management under the influence of EU standards and the Bologna Process

Comparison criterion	Traditional (classical) management model	Modern European integration model (ESG, EHEA)
Interaction vector	Subject-object (top-down management, dominance of directive control)	Subject-subject (student-centered learning, participatory management, stakeholder engagement)
Quality philosophy	External supervision (fixing errors, monitoring compliance with strict formal standards)	Internal quality culture (orientation on continuous self-improvement, self-examination and audit)
Program structure	Rigid and linear (unified curricula, minimal choice of disciplines)	Flexible and modular (use of the ECTS system, individual educational trajectories, micro-qualifications)
Recognition of results	Local/national (orientation on internal standards and specifics of a particular state)	Global/cross-border (alignment with the European Qualifications Framework, convertibility of diplomas)
Technological basis	Central (fragmentary use of information technologies in individual processes)	Ecosystemic (digital educational environments, end-to-end digitalization of management according to the Digital Education Action Plan)

Source: summarized by the author based on an analysis of regulatory documents of the European Higher Education Area

The outlined dynamics of conceptual changes illustrate that modernization requires management systems not just to technically copy European procedures, but to ensure fundamental academic freedoms, institutional autonomy and strengthen the social dimension of education, which guarantees equal access to quality education for all categories of applicants. An integral element of integration into the European scientific and educational array is the implementation of the Standards and Recommendations for Quality Assurance in the European Higher Education Area

(ESG). The specified document acts as a conceptual matrix for the transformation of management systems, shifting the emphasis from external control and supervision to the development of an internal culture of quality within each individual institution. At the national level, this process is ensured by the activities of the National Agency for Quality Assurance in Higher Education (NAQAHE), which coordinates accreditation procedures and stimulates institutions to develop transparent internal regulations and monitor programs with the participation of students and employers. An important vector of such harmonization is also the coordination of the architecture of education levels through the prism of the European Qualifications Framework (EQF), where the descriptors of learning outcomes (knowledge, skills, autonomy) are integrated with the domestic National Qualifications Framework (NQF), ensuring cross-border recognition of diplomas and high competitiveness of human capital. The systematic implementation of these tools in domestic practice requires a clear understanding of their target orientation and specific vectors of adaptation, which currently determine the regulatory and strategic contour of reforming Ukrainian education (Table 7).

The analysis of the above tools shows that integration into the European scientific and educational array is a multi-level process, where the implementation of the Standards and Recommendations for Quality Assurance in the European Higher Education Area (ESG) acts as a conceptual matrix for the transformation of the internal environment of educational institutions. At the same time, the current stage of development of European standards is inextricably linked with the implementation of the Digital Education Action Plan, which requires heads of educational institutions to urgently update infrastructure, increase the digital competence of teaching staff and create inclusive digital ecosystems capable of ensuring high quality education under any conditions and crisis challenges of society. Increased attention to the development of such ecosystems in the European discourse is considered not as a temporary response to the challenges of the present, but as a strategic investment in the formation of a resilient and competitive institutional model of an educational institution of the future.

Table 7 – Key international instruments and their impact on the modernization of the educational space of Ukraine

Regulatory and Strategic Reference (EU/EHEA)	Main essence and target orientation of the instrument	Vector of adaptation and implementation in the educational space of Ukraine
Rome Communiqué (2020)	Declaration of three key commitments (three-cycle degree system, Lisbon Convention, joint quality assurance). Focus on inclusion and innovation	Full harmonization of degrees (bachelor, master, PhD), strengthening the social dimension of higher education, ensuring academic freedom
Quality Assurance Standards and Guidelines (ESG)	A single matrix for building internal and external education quality assessment systems based on transparency and engagement	Activities of the National Agency for Higher Education, development of internal regulations on quality assurance in educational institutions, accreditation of educational programs according to European criteria
European Qualifications Framework (EQF)	Systematization of education levels based on learning outcome descriptors (knowledge, skills, autonomy and responsibility)	Modernization of the National Qualifications Framework (NQF) of Ukraine, bringing higher and professional education standards into line with European descriptors
Digital Education Action Plan	EU strategic program for developing a highly effective digital education ecosystem and improving citizens' digital competences	Forced digitalization of educational management, implementation of cloud technologies, development of national concepts for the development of digital skills of teachers
EU Council Recommendation on Micro-Qualifications	Legitimization of short-term training courses to ensure fast, flexible and continuous professional development	Normative recognition of the results of non-formal and informal education, integration of certificate programs into the total volume of educational components

Source: compiled by the author based on the Rome Communiqué (2020) [13] and the Digital Education Action Plan (2021–2027) [22]

In this context, the digital transformation of the educational space is closely intertwined with the concept of the «knowledge triangle», which involves the formation of sustainable synergistic relationships between education, scientific research and innovative business. This requires management systems to move away from isolated training of specialists in favor of creating joint innovation hubs capable of quickly transforming new knowledge into real technological solutions. At the same time, the architecture of modern European standards is undergoing significant changes under the influence of the global environmental agenda and the concept of the Green Transition, which necessitates the end-to-end implementation of the

European Competence Framework for Sustainable Development (GreenComp). Therefore, the modernized digital environment of an educational institution should act not only as a technological basis, but also as a worldview space that forms environmental responsibility and prepares graduates for life in a climate-neutral and cyclical economy. Such integration of digital, innovative and ecological vectors allows to transform educational institutions into drivers of social transformations, which, in turn, requires a detailed analysis of direct requests and expectations from the global labor market. It is advisable to systematize the structural and component matrix of this integration through specific mechanisms of implementation of European guidelines in the educational space in the form of a generalizing scheme (Table 8).

The strategic guidelines systematized in Table 8 illustrate that the current stage of modernization of the educational space requires a transition from the isolated functioning of individual innovations to the formation of a holistic, multi-vector model of organizational development. The integration of the knowledge triangle concept fundamentally changes the outdated practice of theoretical training disconnected from reality, obliging educational management to build strong partnerships with innovative sectors of the economy and business. This allows not only to adapt the content of programs to current market demands, but also to create joint research hubs, where scientific developments of applicants and teachers are transformed into real commercial or social projects.

At the same time, the environmental vector of reforms, set by the European GreenComp competence framework, requires heads of institutions to go beyond purely declarative slogans about environmental protection and integrate the principles of sustainable development into all components of the educational process. This approach forms in graduates a fundamentally new ecological thinking, focused on a cyclical economy and minimizing anthropogenic pressure on the planet. Finally, the technological basis that connects the innovative and ecological components into a single system is the implementation of the tasks of the Action Plan for Digital Education. End-to-end digitalization of management, the development of inclusive

virtual environments and the improvement of intellectual literacy of personnel allow creating the most sustainable and adaptive institutional model of an educational institution, which is able to develop effectively in conditions of global crises and meet the most stringent requirements of the international scientific and educational space.

Table 8 – Conceptual matrix of integration of the latest European guidelines into the educational space of Ukraine

EU Strategic Guideline	Key component and essence	Implementation mechanism in the educational space	Result for the institutional model of the institution
Knowledge Triangle Concept	Trilateral synergy and interconnection between education, scientific research and innovative business	Creation of joint research and production hubs, expansion of dual education programs, commercialization of developments	Transformation of the educational institution into an open innovation center and a driver of economic development
GreenComp Framework	Formation of competencies in the field of sustainable development, climate neutrality and environmental responsibility	Throughout greening of the content of academic disciplines, implementation of courses on the circular economy	Creation of a worldview space that prepares graduates for the conditions of an environmentally oriented labor market
Digital Education Action Plan	Development of a highly efficient digital ecosystem and increasing the level of digital literacy of subjects	Integration of cloud technologies, data-based management systems, increasing AI literacy of teachers	Transformation of the institution into a sustainable, flexible and technologically competitive system of the future

Source: formed and systematized by the author based on the analysis of the concept of the European GreenComp framework [27] and the provisions of the Digital Education Action Plan [22]

The rapid expansion of the technological landscape and the large-scale implementation of generative artificial intelligence in educational practice lead to the emergence of new regulatory and ethical challenges that directly affect the standards of the European Union and the vectors of domestic modernization. At the pan-European level, this trend was reflected in the adoption of the fundamental EU Regulation on Artificial Intelligence (EU AI Act), where systems intended for use in educational institutions for the purpose of assessing learning outcomes and

monitoring behavior are classified as high-risk, which requires the implementation of strict protocols of transparency, cybersecurity and the mandatory preservation of human control. In the context of educational management, this highlights the need to develop new policies and institutional codes of conduct that would balance between stimulating digital innovations and protecting the rights of applicants. At the same time, the evolution of artificial intelligence tools necessitates a radical revision of classical approaches to ensuring academic integrity. Traditional forms of text borrowing and plagiarism are transformed into more complex forms of unauthorized content generation, when AI performs the functions of independently creating academic texts, which blurs the boundaries of the concept of authorship and complicates the processes of objectively assessing the real cognitive efforts of the education seeker.

Responding to these challenges, the modern European space is shifting the emphasis from repressive or prohibitive practices of using technologies to the formation of a culture of transparent and ethical use of digital assistants, which is reflected in the updated practical guidelines of the European Commission within the framework of the Digital Education Action Plan [22]. The corresponding vector of adaptation is also traced in Ukraine, where at the legislative level, through the norms of the Law of Ukraine «On Academic Integrity» [8] and the relevant recommendations of the Ministry of Education and Science of Ukraine, the principle of transparent documented use of artificial intelligence as an auxiliary analytical tool is established, and not as a complete replacement for individual critical thinking and academic judgment of the author. Thus, institutional adaptation of international guidelines requires the heads of educational institutions to develop and implement flexible internal policies (AI-policies) aimed at developing artificial intelligence literacy of both applicants and scientific and pedagogical workers. This allows modernizing the educational space not through artificial limitation of technological progress, but through the transformation of teaching methods, where routine tasks are delegated to algorithms, and educational management focuses on the development of unique human competencies and support for the fundamental ethical principles of

scientific and educational activity. The objective necessity of such technological and structural restructuring is confirmed by long-term trends of international analytical institutions in comparison with current indicators of human capital transformation in the Ukrainian educational and professional space (Table 9).

The statistical parameters presented in Table 9 require deeper analytical understanding through the prism of the specifics of the development of domestic human capital in the context of systemic European integration reforms. When assessing the level of possession of digital skills, it is necessary to state the presence of a significant internal imbalance between the general level of computer literacy of the population and the specific professional competencies of educational entities.

The indicator of 62,8% of citizens with a basic level of digital skills demonstrates positive dynamics, however, a critical gap is recorded within educational management, since only a third of scientific and pedagogical workers actually own data-based management tools and the methodology of ethical application of generative artificial intelligence. This fact proves that simple infrastructural provision of institutions with computer technology is no longer able to solve the task of modernization, and modern management must reorient itself to the end-to-end implementation of the European Digital Competence Framework for Educators. This involves not only training teachers, but also restructuring management processes, where the ability to operate digital ecosystems becomes a prerequisite for professional certification of management staff.

Table 9 – Statistical indicators and macro trends of the global and domestic educational space and labor market

Statistical indicator / Macrotrend	Current Quantitative Value in EU Countries / Target	Current indicator in Ukraine	Data source and analytical justification of the trend	Impact on the strategy of modernization of education management in Ukraine
Human resource shortage and the need for rapid reskilling (Reskilling)	44% of jobs will undergo skills transformation in the coming years	Over 75% of employers report an acute shortage of qualified personnel	WEF Future of Jobs Report; Analytical panels of the Ministry of Economy of Ukraine and Work.ua	Requires educational management to accelerate the development of dual education and flexible short programs

Continuation of table 9

Level of basic digital skills	Target: at least 80% of the population by 2030 (EU Digital Decade)	62,8% of citizens have a basic level; however, only 35% of educators have Data-Driven and AI-management skills	European Commission Digital Decade Monitoring; National Study of the Ministry of Digital Transformation of Ukraine	Requires the end-to-end implementation of the DigCompEdu framework in educational standards and mandatory digital certification of management
Involvement in the concept of lifelong learning (Lifelong Learning)	Target: 60% of the adult population annually (ET 2030 Strategic Framework)	Only 12–15% of the adult population is systematically involved in formal or informal learning	Eurostat Reports; Monitoring Studies of the National Academy of Sciences of Ukraine and the Institute of Demography of the National Academy of Sciences of Ukraine	Requires the immediate removal of bureaucratic barriers, legitimization of microqualifications and simplification of validation procedures for non-formal education
Request for psychosocial support and resilience skills (Resilience)	About 30-35% of EU students report high levels of stress in academic environments	Over 82% of education seekers and teachers report constant psycho-emotional pressure and burnout	WHO Mental Health Survey; National Academy of Sciences of Ukraine Survey and sociological monitoring in Ukraine	Requires management to integrate courses on mental health, stress resistance and self-reliance into all programs

Source: formed and systematized by the author based on analytical reports of the World Economic Forum (WEF) [31], monitoring reports of the Ministry of Digital Transformation of Ukraine [17], NAZYAVO [14] and analytical materials of the Center for Economic Strategy [16]

Traditional domestic educational institutions have long remained closed structures, where the results of non-formal and informal learning, acquired by citizens at trainings, courses or during practical activities, were practically not reflected in official documents due to the lack of flexible validation mechanisms. Overcoming this barrier requires educational managers to immediately normatively and practically implement the European approach to microqualifications, which will allow educational institutions to quickly re-establish short-term educational components, diversify their services and turn into open centers of continuous professional development for the adult population.

Generalized statistical indicators clearly demonstrate that the modern modernization of the educational space is under strong pressure from the structural

restructuring of the global economy. These digital and qualification benchmarks require a radical revision of the target settings of domestic institutions, as the gap between traditional academic training and dynamic industry demands continues to grow. Thus, an important external determinant that determines the content and architecture of modernization processes is the radical transformation of the requirements of the global labor market for a modern specialist.

The study of the architecture of the modern global labor market through the prism of the challenges of Industry 4.0 and the accelerated development of high technologies illustrates a radical change in the requirements for the qualification profile of a modern graduate. The traditional model of professional suitability, which for a long time was based mainly on highly specialized subject knowledge and hard skills (Hard Skills), in modern realities demonstrates limited viability. Dynamic technological progress and rapid obsolescence of production algorithms cause a phenomenon in which purely technical information loses its relevance even before the applicant completes the full cycle of education. Therefore, international guidelines for the modernization of education systems shift the emphasis to the formation of supra-professional, soft competencies (Soft Skills), which determine the ability of an individual to effective socio-professional adaptation. In the structure of these skills, the leading place is occupied by developed critical thinking, cognitive flexibility, emotional intelligence, cross-cultural and digital communication skills, as well as the ability to effectively work in teams in virtual and geographically distributed environments. At the same time, the management of a modern educational institution must rethink the content of education itself, integrating the development of these skills not as an optional component, but as a cross-cutting element of all educational programs, implemented through interactive and project-based teaching methods.

In parallel with the transformation of skills, the concept of lifelong learning is being finally approved as a fundamental prerequisite for maintaining a person's professional competitiveness. The global labor market no longer guarantees the stability of one chosen profession, transforming into a space of constant change in

functional responsibilities and the emergence of new cross-functional specializations. Under such conditions, the key meta-competence of a specialist becomes the ability to continuously learn independently, readiness for rapid retraining (Reskilling) and constant upskilling (Upskilling). In the context of educational innovation management, this requires the development of such institutional models that are able to provide a person with easy and unhindered access to educational resources at any stage of his life and career path. An additional important factor shaping the modern professional profile is the global trend towards greening the economy, which requires possession of so-called green skills (Green Skills). A modern specialist, regardless of the specific field of activity, must have a basic level of environmental literacy, understand the principles of sustainable development and cyclical production, and be able to minimize the destructive ecological footprint in their professional practice. Thus, the requirements of the global labor market act as a powerful determinant, forcing educational management to abandon reproductive models of training in favor of the formation of a proactive, adaptive and ideologically mature personality of the specialist of the future.

The practical implementation of the outlined international guidelines and the adaptation of the requirements of the global labor market to the educational space of Ukraine requires the formation of clear, multi-level administrative and legal mechanisms. The leading tool in this process is the consistent harmonization of domestic legislation, in particular the Laws of Ukraine «On Education» [10] and «On Higher Education» [9], with the directives of the European Union, which allows for the legal consolidation of new innovative forms of education. An important institutional mechanism is the expansion of the practice of dual education, which involves the integration of theoretical education on the basis of institutions with the parallel acquisition of practical skills directly at the workplaces of partner enterprises. This allows partially to bridge the gap between academic training and real technological processes. In addition, the mechanism of internationalization of the educational process through the active participation of Ukrainian institutions in international grant programs, such as Erasmus+ and Horizon Europe, is of great

importance, which stimulates the development of cross-border mobility, joint scientific research and the launch of double degree programs. The key transparency tool in this system remains the development of the National Qualifications Framework, which is being transformed into a flexible matrix capable of promptly registering the emergence of new interdisciplinary professional standards.

At the same time, the process of systematic adaptation of European standards into domestic practice is accompanied by a number of deep institutional, financial and mental challenges that significantly slow down the pace of modernization of the educational space. The main restraining factor remains the high level of bureaucratization of management processes at all levels, when formal reporting and strict control often prevail over real support for academic freedoms and innovative initiatives. This challenge is exacerbated by the chronic deficit in funding for the education sector, which limits the ability of institutions to modernize their material and technical base, staffing and the development of full-fledged digital ecosystems. Moreover, the existing regulatory model significantly limits the financial independence and autonomy of educational institutions, preventing them from flexibly operating with resources and attracting investments from business structures. An additional mental challenge is the inertia and resistance to change on the part of the scientific and pedagogical community, which is accustomed to reproductive teaching methods and shows low readiness to quickly master artificial intelligence tools and concepts of continuous professional development. The elimination of these contradictions requires educational management to transition to proactive management strategies focused on comprehensive support for flexibility, transparency and partnership with all key stakeholders.

Therefore, the European integration vector of development is not just a political declaration, but an objective condition for preserving and increasing the human capital of Ukraine on the world stage. Adaptation of the Bologna Process standards, ESG requirements and European Qualifications Framework instruments allows for the creation of an open, transparent and convertible education system integrated into a single European scientific and educational space. At the same time,

the current stage of modernization requires heads of institutions to go beyond the mere copying of foreign templates. Education management should focus on building sustainable internal quality assurance systems, implementing innovative models of the «knowledge triangle» and legitimizing micro-qualifications as a response to the dynamic demands of the global labor market. The main task of managerial innovations in these conditions is to transform an educational institution from a conservative structure into a flexible, inclusive, and digitalized ecosystem that is able to eliminate the internal challenges of bureaucratization, develop critical thinking and soft skills of applicants, and ensure continuous personal learning throughout life.

The development of the modern architecture of educational innovation management is determined by the diversity of geopolitical, economic and socio-cultural conditions, which led to the formation of several dominant global strategies and management models. A comparative analysis of these approaches allows not only to identify specific tools for implementing reforms, but also to identify universal patterns that can serve as guidelines for the domestic educational system. In world practice, the Anglo-American management model, inherent in the USA, Great Britain and Australia, is clearly distinguished, where the key driver of innovative development is a market-oriented philosophy, a high level of decentralization and deep institutional autonomy. Within the framework of this strategy, educational institutions are considered as independent entities of the competitive market of educational services, which forces management to respond flexibly to consumer demands, actively attract venture capital and integrate business management models. Innovation here is stimulated through grant funding mechanisms, the development of university startup incubators, and direct orders from the corporate sector, which ensures a high speed of commercialization of scientific developments, but creates risks of increasing social inequality in access to quality services.

A fundamentally different architecture characterizes the continental European model, which dominates the countries of the European Union, in particular in Germany, France and the Scandinavian countries. This strategy is based on the dominance of public funding, strict adherence to national and supranational quality

standards and the priority of the social dimension of education. Educational management in the European discourse is focused on participatory governance, where decisions are made on the basis of consensus between state institutions, the academic community and a wide range of stakeholders. Innovation activities here are carried out within the framework of comprehensive framework programs, such as Horizon Europe, and are aimed at solving global social challenges, greening through the concept of green transition and comprehensive digitalization. A feature of the European approach is the emphasis on building a culture of internal quality assurance, where innovations are the result not so much of fierce market competition, but of systematic, systematic self-improvement of each educational institution.

Of particular scientific interest is the Asian (East Asian) strategy for managing educational innovations, vividly represented by the experience of Singapore, South Korea, and Japan. This model organically combines strict strategic planning and control by the state with phenomenal technological flexibility and the forced introduction of digital systems. In the Asian paradigm, the modernization of education is considered a cornerstone of national security and economic breakthrough, which determines direct state financing of the most promising technological areas, in particular artificial intelligence, robotics, and big data analysis. Educational management in these countries operates within a meritocratic system, where special attention is paid to the continuous improvement of the qualifications of teaching staff and the strict selection of management. Despite a certain directive nature of management, such a model provides a unique speed of scaling successful innovations at the level of the entire state, transforming the educational space into a high-tech ecosystem. Deep differences in the targets, financial instruments, and management mechanisms of the considered geopolitical strategies necessitate their generalization according to key effectiveness criteria (Table 10).

Table 10 – Comparative matrix of world models of educational innovation management

Comparison criterion	Anglo-American model (USA, UK)	Continental European model (EU countries)	East Asian model (Singapore, South Korea)
Leading management philosophy	Market-oriented, competitive, decentralized	Socially oriented, standardized, participatory	State-centric, meritocratic, technocratic
Level of institutional autonomy	Maximum (institutions operate as autonomous business entities)	High (academic freedom combined with state framework control)	Moderate (clear subordination to national strategic plans)
Sources and financing mechanisms	Diversified (private equity, venture capital funds, corporate grants)	Predominantly state (budgetary funds, supranational EU programs)	Targeted state (direct funding of priority innovation sectors)
Vector of innovation stimulation	Market and commercialization (development of startup incubators, technology transfer)	Social challenges and quality (greening GreenComp, building a quality culture)	Technological breakthrough (large-scale implementation of AI, automation, Big Data)
Nature of reform implementation	Initiative (innovations arise from the bottom up through competition)	Consensus (agreement of decisions with a wide range of stakeholders)	Directive (rapid vertical scaling of innovations «op-down»)

Source: formed and systematized by the author based on a comparative analysis of world management strategies

Comparison of the above-mentioned world strategies within the framework of a comparative matrix allows us to assert that modern global educational management is at the stage of convergence, when leading countries are trying to borrow the best elements from alternative models. Thus, the Anglo-American system pays more and more attention to state regulation of standards, European countries are introducing elements of financial autonomy and market mechanisms, and Asian countries are trying to expand academic freedom to stimulate the creativity of applicants. For Ukraine, which is in a state of transformational transit and European integration, comparative analysis proves the inexpediency of blindly copying any one model. The most rational vector is the construction of a hybrid management strategy that would combine the European orientation on social standards and quality with the Anglo-American flexibility of business partnership within the knowledge triangle and Asian determination in the digitalization of processes. Understanding this world experience creates a theoretical basis for assessing the real state of the domestic educational

space, the analysis of which requires a detailed study of the readiness of the management body itself to perceive and implement such large-scale innovative changes.

The transition from theoretical understanding of global comparative models to practical modernization of the national educational space requires a deep study of the internal subjective factor, namely the level of readiness of management personnel to implement systemic reforms. Within the framework of scientific discourse, the innovative readiness of an educational manager is considered as a multi-component integral formation that encompasses motivational-value, cognitive, activity-technological and reflective-psychological criteria. An empirical analysis of the current state of the management corps in Ukraine, carried out on the basis of generalization of monitoring sections of the National Agency for Quality Assurance in Higher Education, research by the Ministry of Digital Transformation and sociological surveys of heads of institutions, illustrates a complex and contradictory dynamics. On the one hand, a high level of declarative and motivational readiness for change is recorded, due to the general European integration vector of the state and the need to adapt to the crisis conditions of wartime. On the other hand, during the transition to the operational-technological level, a significant gap is revealed between innovative intentions and real management practices, which indicates the presence of deep institutional and psychosocial barriers.

A critical aspect of the empirical analysis is the assessment of the cognitive and technological components of innovation readiness through the prism of digital and artificial intelligence literacy of management. Despite the fact that the overall level of mastery of basic information and communication technologies among managers demonstrates stable growth, the ability to manage based on data (Data-Driven Management) remains at an unsatisfactory level. Empirical data confirm that most managers use digital tools mainly to automate routine document flow and formal reporting, while analytical forecasting systems, cloud services of integrated management and algorithms of generative artificial intelligence are implemented only by a few institutions. The problem of the lack of clear institutional policies of

artificial intelligence (AI-policies) is particularly acute, which, in the conditions of massive uncontrolled use of technologies by applicants, poses a threat to the system of academic integrity. Institutional leaders often lack specific knowledge about regulating these processes, which transforms technological progress from a driver of modernization into an additional factor of risk and managerial chaos. In order to more accurately identify and differentiate the components of this process, the structural and functional components of the innovation readiness of management personnel, the levels of their practical manifestation, and specific institutional barriers are systematized in the form of a generalizing matrix (Table 11).

Analysis of the above diagnostic matrix allows us to state the presence of a deep disproportion between the internal potential of educational management and the real tools for its practical implementation. The high level of the motivational and value criterion indicates that Ukrainian leaders are mentally ready for European integration transformations and are clearly aware of the need for modernization, but this potential is blocked at the activity-technological level due to systemic institutional barriers.

Table 11 – Diagnostic matrix of criteria, levels and barriers of innovation readiness of educational management in Ukraine

Readiness criterion	Predominant level of expression	Empirical markers and manifestations in management practice	Key institutional and mental barriers
Motivational-valued	High (declarative-oriented)	Understanding the inevitability of reforms; high interest in European integration tools; desire to improve the status of the institution	Fear of the risk of failure; professional burnout due to chronic stress; lack of a system for stimulating innovation
Cognitive-theoretical	Medium (fragmentary-informational)	Availability of basic knowledge about the Bologna Process and ESG; understanding of digitalization trends at a theoretical level	Lack of knowledge in Data-Driven management and legal regulation of AI; lack of understanding of the essence of micro-qualifications

Continuation of table 11

Active-technological	Low (reproductive-passive)	Use of ICT mainly for reporting; weak interaction with business; lack of local AI-policies	High level of bureaucracy; strict regulatory restrictions on autonomy; lack of funding for digital ecosystems
Reflexive-psychological	Moderate (adaptive-protective)	Ability for emergency anti-crisis response and relocation; desire to maintain the viability of the team	Inertia and resistance to change on the part of personnel; weakness of feedback channels; shortage of psychosocial support skills

Source: formed and systematized by the author based on the generalization of monitoring data of the National Agency for the Supervision of Higher Education and Science [14], the Ministry of Digital Transformations of Ukraine [5] and national sociological surveys

The dominance of the reproductive-passive level in the field of practical implementation of innovations is directly related to the excessive bureaucratization of the educational environment, where the need to prepare large volumes of formal reporting absorbs the main time and intellectual resource of the manager. The lack of practical management skills based on big data and the absence of clear local strategies for regulating artificial intelligence turn cognitive deficit into a serious factor of institutional risk, which, in the conditions of weak financial independence of institutions, limits the possibilities for deploying full-fledged digital ecosystems. Moreover, the reflexive-psychological section shows that despite the unique adaptability to the challenges of martial law, management faces personnel inertia and internal resistance to change, which is a natural protective reaction to resource shortages and psycho-emotional burnout. Overcoming these differences requires a systematic shift in emphasis in the training and improvement of the qualifications of managers themselves, where the development of artificial intelligence literacy, flexible anti-crisis leadership skills, and mastering the mechanisms for validating informal education should come first, which will allow transforming declarative readiness into real innovative development practices.

An equally important empirical marker is the reflexive-psychological readiness of educational management, which directly affects the ability to overcome inertia and resistance to change within teams. The current stage of reform is taking place in conditions of chronic psycho-emotional pressure, professional burnout and personnel

shortage, which requires the manager to have a high level of personal resilience and skills in psychosocial support of subordinates. Empirical studies show that more than 80% of educators feel the need to optimize the microclimate and integrate mental health components into the educational space, however, traditional management approaches focused on directive control are ineffective in such conditions. Resistance to innovation on the part of the scientific and pedagogical community is often a defensive reaction to the shortage of resources and misunderstanding of the ultimate goal of reforms, which is exacerbated by the weakness of internal communication channels. Thus, empirical analysis proves that management modernization cannot be limited to regulatory regulations, but requires targeted psychological and managerial support for managers, the development of their emotional intelligence, and the transition from administration to leadership.

The logical conclusion of the analysis of the current state of domestic educational management is a comprehensive critical study of the external and internal conditions in which the activities of reforming entities are carried out, namely the regulatory and legal framework and infrastructure support for innovation processes. The modern regulatory field of Ukraine, despite the adoption of the progressive Laws of Ukraine «On Education» [10], «On Higher Education» [9] and the basic law «On Academic Integrity» [8], is characterized by a significant asymmetry between declarative norms and real mechanisms for their enforcement. This problem is most clearly manifested in the sphere of implementing academic and financial autonomy of educational institutions. Current legislation proclaims financial independence as the cornerstone of modernization, but in practice institutions remain bound by strict treasury procedures, restrictions on the use of special funds and attracting direct investments from private business. This makes it impossible to fully deploy the concept of the «knowledge triangle», since joint innovation hubs and scientific and industrial clusters encounter fiscal and property barriers, which blocks the legal commercialization of scientific developments of teachers and students. Similar regulatory deformations are also recorded during attempts to implement the European concept of micro-credentials. The lack of clearly prescribed bylaws that would

regulate the transparent and rapid validation of the results of non-formal and informal education creates bureaucratic obstacles, turning the flexible mechanism for reskilling the adult population into a complex and inefficient procedure.

No less acute contradictions are manifested in the infrastructure dimension, which in modern realities is subject to powerful destructive pressure from exogenous factors and crisis challenges. The development of highly effective digital ecosystems, envisaged by the European Union's Digital Education Action Plan, in Ukraine is forced to adapt to the conditions of constant infrastructure limitations, staff shortages and security risks. Creating a sustainable information environment requires large-scale investments in server equipment, cloud management services and licensed software for Data-Driven management. However, state funding mostly covers only routine protected expenditure items, leaving infrastructure modernization to the discretion of the institutions themselves and the donor funds involved. This leads to significant infrastructural differentiation, where leading institutions are able to implement elements of artificial intelligence and digital document management systems, while peripheral institutions remain at the level of elementary computerization, which preserves inequality in the quality of educational services. It is advisable to summarize the complex contour of identified contradictions in the regulatory, legal and material and technical architecture of domestic education in combination with potential strategic vectors for overcoming and optimizing them in the form of a structural and functional matrix (Table 12).

Table 12 – Matrix of regulatory and infrastructure problems of the educational space of Ukraine and management ways to overcome them

Dimension of innovation support	The essence of the barrier / Systemic problem	Specific destructive consequences for the institution	Strategic ways to overcome (management decisions)
Regulatory and legal (financial aspect)	Harsh restrictions on financial autonomy, treasury regulation of special funds	Blocking of commercialization of developments in the «knowledge triangle», inability to attract business capital	Legalization of public-private partnership models, granting institutions the right to independently operate with revenues

Continuation of table 12

Regulatory and legal (qualification aspect)	Lack of by-laws and methodology for legitimizing micro-qualifications	Bureaucratization of reskilling processes of the adult population, isolation from flexible EU practices	Approval at the state level of the national standard for validation of non-formal and informal education
Infrastructural (technological aspect)	Uneven financing of the digital environment, shortage of server and cloud equipment	Infrastructural differentiation and unequal access of applicants to advanced digital technologies	Targeted infrastructure investment based on a project approach, creation of cloud consortia
Infrastructural (ethical and regulatory aspect)	Lack of national standards and tools for controlling generative AI	Threat to the system of academic integrity, fragmentation of local institutional AI-policies	Development of unified technical and methodological guidelines in accordance with the EU AI Act, increasing AI literacy

Source: formed and systematized by the author based on an analysis of the legislative framework of Ukraine, the provisions of the EU AI Act and monitoring of the material and technical condition of educational institutions

The architecture of problems and management alternatives systematized in the matrix makes it clear that overcoming barriers to Ukraine's innovative development requires abandoning fragmented solutions in favor of end-to-end, systemic reform. The regulatory and legal dimension of the identified contradictions clearly demonstrates that the autonomy of educational institutions declared in official documents remains limited due to excessive fiscal regulation, which does not allow organizations to become full-fledged and flexible participants in the open innovation market. This preserves the isolation of the academic environment from industry demands and levels the potential of the knowledge triangle concept, since business structures do not have legal and simple tools for long-term infrastructure investment in education. At the same time, infrastructure problems, exacerbated by today's crisis and security challenges, require an immediate review of approaches to resource allocation, where the passive retention of outdated funds should be replaced by project-specific financing for the development of digital ecosystems. Technological and legal regulation of ethical aspects of digitalization is of particular importance, since the lack of national standards in the field of interaction with artificial intelligence shifts the entire burden of control over academic integrity to the local

management of institutions, which does not always have the necessary cognitive and technical tools. Thus, the generalized matrix proves that successful modernization of the domestic educational space is possible only under the condition of synchronous elimination of legal contradictions and technological modernization of the base, which is the foundation for the formation of a viable innovation management model.

An important vector of infrastructural and regulatory reforms in modern realities is also the regulatory and technological regulation of the use of artificial intelligence in the light of the Law of Ukraine «On Academic Integrity» [8] and the pan-European guidelines of the Regulation on AI (EU AI Act). The domestic education system is acutely experiencing a shortage of technical and methodological standards developed at the state level to detect unauthorized content generation, which forces each institution to independently and in isolation look for tools for monitoring the ethics of academic texts. Such fragmentation of regulatory and infrastructural support hinders the transformation of the Ukrainian educational space into an open, inclusive and sustainable ecosystem. Overcoming these systemic problems requires the immediate elimination of contradictions in bylaws, the expansion of real financial freedom of institutions through the legalization of various models of public-private partnership and targeted infrastructure investment in the digital and psychosocial architecture of education, which is a basic prerequisite for the successful implementation of the conceptual and design stage of reforms.

Modern megatrends act as powerful objective catalysts for the innovative development of the global and domestic educational space. Such large-scale phenomena as forced digitalization, the rapid introduction of generative artificial intelligence, the green transition and ecologization of the economy, as well as a total change in labor market demands towards soft skills and continuous learning, can no longer be considered as optional or secondary factors. They form a fundamentally new, rigid coordination contour within which conservative, isolated institutional models finally lose their viability. Global guidelines force modern educational management to make a radical paradigm shift – to move away from the reproductive

transmission of knowledge to the creation of open, flexible and sustainable ecosystems capable of acting as subjects of the advanced development of society.

For Ukraine, which is implementing modernization processes in the face of unprecedented security challenges and accelerated European integration, global macrotrends are becoming a strategic framework for overcoming internal deformations. Comparative analysis and statistical cross-sections clearly demonstrate that successful adaptation of international standards, provisions of the Rome Communiqué, guidelines on the legal regulation of AI, and concepts of the «knowledge triangle» requires management personnel not to mechanically copy foreign templates, but to proactively build an internal culture of quality and implement financial and academic autonomy. Thus, global trends as catalysts of innovation do not simply indicate the direction of reforms, but require immediate restructuring of the cognitive and activity profile of the management corps itself, which is a basic prerequisite for eliminating regulatory and infrastructural barriers and successfully transitioning to designing viable, competitive models of domestic educational management at the next stages of transformation.

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2. Modernization of educational institution management in the conditions of European integration

Dynamic transformations that have covered all spheres of life in modern society pose fundamentally new requirements for the functioning and development of the national education system. Ukraine's movement towards European integration, the construction of an open information society, and the need to respond to global challenges of the 21st century actualize the need for a radical modernization of the management vertical in the education sector. The management of a modern educational institution can no longer be limited to the framework of classical administration, which was focused on strict control, the implementation of directive instructions and the preservation of the static state of the system. Today, the success of an educational institution directly depends on its flexibility, adaptability and ability to implement innovative management models.

The relevance of studying the managerial aspects of the modernization of an educational institution in the European integration context is due to a number of contradictions between traditional managerial practices and modern requirements of the educational services market. The transition from an authoritarian style of management to participatory (collegial) management, based on the principles of partnership, autonomy and state-public interaction, is a key indicator of the approximation of domestic education to European standards. In these conditions, the head of an educational institution appears as a strategic manager and leader of change, whose task is to create a favorable, creative and safe environment for all participants in the educational process.

An important challenge of our time is also the need to ensure high quality education in conditions of rapid digitalization and uncertainty. This requires managers to develop and implement new approaches based on constant monitoring of the quality of educational services, the use of marketing tools and information and computer technologies. Only with the comprehensive modernization of management

processes is it possible to achieve a synergistic effect: reduce the level of professional burnout of teachers, expand their academic freedom, increase the motivation of students and, ultimately, form a competitive personality capable of successful self-realization in the modern world.

This section examines the theoretical, methodological and practical principles of updating management strategies, analyzes the impact of the deformation of learning on the effectiveness of the educational process, and identifies key tools of innovative management that allow educational institutions to effectively develop in the context of European integration and modern social challenges.

Various aspects of the modernization of educational management and ensuring the quality of education are in the focus of attention of many domestic and foreign researchers. Thus, the philosophical and methodological principles of reforming the industry are highlighted in the works of V. Kremen and V. Andrushchenko. The issue of implementing innovative and adaptive models of management of educational institutions has been thoroughly studied by G. El'nikova, V. Maslov, and E. Kovalenko. The issues of assessing and monitoring the quality of educational services are reflected in the scientific work of T. Lukina, and the psychological factors of effective leadership of the teaching staff are reflected in the works of L. Karamushka. Among foreign concepts, the theory of total quality management (E. Deming, J. Juran), the concept of change management (J. Kotter, K. Lewin) and the theory of educational transformations of M. Fullan are of fundamental importance for our research.

The theoretical and methodological synthesis of the philosophy of human centrism of I. Zyazyun and the concept of systemic innovative thinking of V. Khymynets in the context of the implementation of the European integration vector necessitates a radical renewal of the management functions of the head of an educational institution. The specified vector of transformation requires a transition from classical administration (aimed at the mechanical maintenance of the institution's life) to strategic management, focused on the development of human potential and integration into the European educational space [37].

In this dimension, the traditional functions of the manager acquire a fundamentally new content:

– the predictive and strategic function shifts from the implementation of top-down directives to the independent design of an open, flexible trajectory of the institution's development. Top-down directives (the «top-down» model) are edited, transforming them from rigid orders into flexible goals. This removes the team's resistance and allows the strategy to be adapted to real conditions, while maintaining a focus on the main result. The manager must act in conditions of high autonomy, guided by international quality standards and the principles of academic freedom;

– the organizational and motivational function is transformed through the prism of the ideas of humanism. Its goal is not total control, but the creation of a psychologically safe, stimulating and creative environment. In such an environment, the teacher is not a passive reproducer of knowledge, but an active subject of the innovation process, protected from professional burnout and bureaucratic pressure;

– the innovative and technological function involves the formation of a holistic innovation ecosystem of the institution. The head as a leader of change ensures the systematic implementation of the latest management and digital technologies, stimulates academic mobility and the integration of research activities into international scientific networks [3].

I. Zyazyun argues that in market conditions, educators and managers need to «focus their efforts», they must realize the existence of alternative opportunities, and also take into account the contradiction between the need, on the one hand, to provide each person with complete freedom, and on the other, to make them want to do what society needs.

The level of progress that can be achieved without coercion depends on the understanding of two starting points.

The first is that democratic ideas should be developed by each new generation, using the education system for this.

The second is that there should be a connection between progressive changes in society and the philosophy of reforming the education system.

Given the relevance of the problem of modernization of pedagogical education, the existing level of research and the divergence of views of researchers on the essence and prospects for solving the problem, the scientist considers it necessary to determine the purpose of this work. Such an approach requires, in the context of the problem of modernization of pedagogical education, clarification, firstly, of the actual content of the subject of pedagogy; secondly, the essence and categorical content of the concept of modernization, which will allow to some extent to agree on the position of scientists regarding the content of existing research on this problem [3]. Therefore, the starting point of the outlined problem is the need to modernize pedagogical education.

Thus, the harmonization of the individual's relations with the world, which I. Zyazyun defined as the highest goal of education, in the practical plane of modern management is achieved through the formation of systemic innovative thinking in the pedagogical team according to V. Khymynets. The head of the educational institution becomes the main mediator of this process, and the modernization of its management functions acts as a tool that translates European integration slogans into the format of daily high-quality educational practice [37].

Management activity in the context of European integration ceases to be a purely executive mechanism and turns into strategic leadership, where the main task of the manager becomes the development, support and scaling of innovative technologies. This necessitates the transition from piecemeal, spontaneous implementation of individual innovations to the formation of a holistic innovation ecosystem of an educational institution. n such an ecosystem, «innovative technologies» are considered not only as learning tools (digital platforms, interactive methods), but as comprehensive management solutions that optimize the organizational structure, expand the autonomy of teachers, and ensure transparent monitoring of the quality of education.

Based on the legislative definition of innovations as organizational, technical and administrative solutions that significantly improve the quality of the social sphere, we can state: modernization of management in the European integration

context is primarily an innovation of an administrative nature. It involves the implementation of participatory management models, where a teacher turns from a passive executor of instructions into an active subject and co-author of changes, capable of constant self-development and professional search.

Thus, innovative learning, focused on dynamic changes in the world, cannot fully function within the framework of an outdated, over-administered management system. Designing an open future for students, forming their high social and adaptive capabilities and creative thinking requires adequate management support – flexible, adaptive and reflective. That is why researching the innovative potential of management personnel and creating favorable organizational and psychological conditions for the perception of innovations by the entire team is the cornerstone of the successful modernization of a modern educational institution on the path to the European educational space.

Objective transformation of the architectonics of the domestic educational space requires rethinking the theoretical and methodological basis on which the activities of the heads of modern educational institutions are based. For a long time, domestic management practice relied on classical linear-functional and command-administrative models, which in a stable socio-cultural environment demonstrated relative efficiency. However, as academician V. Kremen argues in his fundamental works, the post-industrial era, or the knowledge society, puts forward conceptually different requirements for human capital [21]. The development of a successful, sovereign state is directly correlated with the emergence of an educated, educated, spiritually mature and critically thinking personality, which makes it impossible to use reproductive and authoritarian management approaches. According to V. Kremen, the philosophy of humanism should become the cornerstone of any educational reforms, which automatically shifts the focus of managerial attention from rigid institutional frameworks to the personality of the participant in the educational process – his needs, potential and trajectory of self-development [22].

At the turn of the millennium, as V. Kremen notes, «a historical transition of humanity from industrial to information civilization is taking place» [23, p. 3]. We

are witnessing a global world-building, in which information, science, and education set the tempo of self-development and the stability of the functioning of a new type of social relations. Given the complexity of the problems of the future stage of social development, there is an urgent need to form a qualitatively new personality, which would have a much higher intellectual and vital-energy potential than representatives of the previous generation of people [23].

It is clear that under these conditions, domestic pedagogical education faces the problem of ensuring its adequacy to scientific, technical and educational processes that determine its state, directions and pace of development.

Developing the philosophical foundations of the modernization of the industry, Ukrainian researcher G. Yel'nikova substantiated and introduced into scientific circulation the concept of adaptive management of educational institutions [1]. The methodological value of G. Yel'nikova's theory in the context of overcoming the challenges of the VUCA/BANI world lies in the interpretation of an educational institution as an open, nonlinear, self-organizing system. Under the conditions of an adaptive approach, management is transformed from subject-object (directive) to subject-subject interaction. The head of an educational institution under such a model refuses total control in favor of creating conditions for self-regulation and internal organization of the teaching staff. Adaptive management ensures the institution's flexible response to fluctuations in the external environment (economic crises, challenges of digitalization, changes in the regulatory framework), which allows the institution not only to survive, but also to develop dynamically, ahead of the demands of society [1].

The ability of an educational institution to innovative development is determined by its innovative potential, that is, the ability to implement managerial and pedagogical innovations within the chosen strategic vector of European integration. The ability to carry out modernization activities is determined not only by the internal resources of the educational organization, but also by the set of external and internal conditions (regulatory and legal, financial and economic, socio-cultural), which contribute to or, conversely, hinder adaptation to European educational

standards. In turn, the readiness of an educational institution for systemic transformations is determined by a combination of its potential capacity, available opportunities and an effective incentive motive. In the context of European integration processes, such a motive appears as the innovative susceptibility of management and teaching staff, which is manifested in openness to international experience, the desire to improve the quality of educational services and academic mobility.

A comprehensive analysis of the capacity, opportunities and readiness of an educational institution for innovative progress should be carried out with mandatory consideration of its overall development strategy. The latter is determined by specific socio-economic circumstances, the level of autonomy of the institution, investment and grant prospects, as well as target benchmarks for competitiveness in the educational services market, integration into the European educational space and meeting the needs of key stakeholders.

After clearly outlining the vision and mission of modernizing the institution's management, there is an objective need to analyze how well the available resources and structure of innovative potential correspond to the chosen European integration course. Such a diagnostic approach allows us to objectively assess the real capacity of the administrative apparatus to implement new management models (in particular, participatory and project management), as well as to identify barriers to innovative receptivity within the team (such as psychological resistance to change or professional burnout due to excessive bureaucratization). Ultimately, this makes it possible to develop a flexible, adaptive modernization strategy that transforms external European integration requirements into internal qualitative shifts in the educational process.

In turn, researcher V. Maslov, analyzing the scientific foundations of organizational management, emphasizes the need for a clear distinction between the concepts of «administration» and «development management» [30].

V. Maslov argues that the modernization of the management structure involves a transition from a functional approach (where each employee clearly carries out

limited instructions) to a process-targeted and systemic one. Management based on innovative approaches, according to V. Maslov, should be considered as a continuous cycle of updating management functions, aimed at transferring an educational institution from its current state of functioning to a qualitatively new state of systemic development. This involves the decentralization of management powers, the involvement of collegial bodies (pedagogical councils, supervisory boards, student/pupil self-government bodies) in the processes of strategic planning and decision-making [30].

The transition to innovative management models inevitably affects the internal atmosphere of the educational institution and the psycho-emotional state of the team. One of the most acute problems of the modern domestic pedagogical space remains the high level of bureaucratization and formalization of the educational process, which acts as a powerful catalyst for destructive changes in the personality of the teacher/lecturer. Systematic research on this issue is carried out by the leading Ukrainian specialist in the field of psychology of educational management L. Karamushka [16].

A particular danger in this context is the syndrome of professional burnout, which not only destroys the personal potential of the teacher, but also blocks any attempts to modernize the institution. A deep analysis of this destructive trend, carried out by L. Karamushka, allowed the scientist to distinguish three interrelated levels of change management – macro-, meso- and micro-level, each of which requires specific organizational and psychological conditions to level the above risks [15, p. 172].

Thus, at the macro level (the level of society), the success of innovations directly depends on the thorough preliminary preparation of society and the involvement of exclusively high-class professionals in the process. However, at the meso level (directly in the educational organization), the transformation management process unfolds in five consecutive stages: from a deep analysis of current activities and the development of a scientifically sound concept – to the formation of positive

motivation of the team, experimental testing and the final gradual implementation of changes with a clear focus on results [15, p. 175].

Effective implementation of these stages is possible only if a strong organizational and psychological foundation is created. It involves ensuring psychological readiness and cohesion of the team, a clear division of responsibilities, the creation of appropriate working conditions, as well as the development of modern methodological tools and an effective system of employee incentives.

In his works, L. Karamushka proves that an authoritarian leadership style, excessive paper-making pressure, and the lack of real academic freedom are the root causes of the burnout syndrome among scientific and pedagogical workers [16]. The innovative approach to management, which is promoted by the scientific school of L. Karamushka, is based on the implementation of the principles of participatory management, psychological support of managerial activities, and stimulation of team interaction [17].

Deformalization of the educational process, which is understood as a departure from theorized, artificially complicated schemes for organizing learning in favor of the teacher's creative freedom, gives clear positive effects:

For teaching staff: expanding the boundaries of autonomy allows the teacher to independently design original programs, choose innovative teaching methods (project-based learning, flipped classroom, case technologies), which leads to the actualization of internal motivation for work, an increase in the level of self-esteem and a significant decrease in emotional exhaustion. The educational institution is transformed into a «self-learning organization», where professional development occurs not under compulsion, but through a perceived need for self-improvement.

For students: the elimination of authoritarianism and formalism on the part of the teacher changes the psychological climate in the student/pupil audience. The fear of making a mistake is replaced by an atmosphere of trust and partnership. Students begin to actively copy the behavior model of a creative, uncomplexed leader-teacher, which stimulates their cognitive activity, critical thinking, the desire for self-knowledge and leads to deep, rather than superficial, assimilation of knowledge [17].

The credo of modern teaching – «maximum creativity and practical orientation» – requires the head of the institution to develop appropriate incentive systems. E. Kovalenko notes that the introduction of innovations cannot occur exclusively by issuing orders «from above». The management must develop a motivational complex that includes both material incentives (differentiated bonuses for innovative activities, grant support) and moral and psychological factors (recognition of colleagues' successes, creation of conditions for professional reflective analysis, granting the right to pedagogical risk) [19].

Ensuring high quality of the educational process is the ultimate goal of implementing any management innovations. In modern Ukrainian science, the assessment of this quality has moved from the plane of subjective expert judgments to the plane of precise scientific measurements – qualimetry of education. Theoretical and methodological principles of monitoring the quality of educational activities of an institution are thoroughly developed in the works of T. Lukina [25].

According to the approaches of T. Lukina, the internal education quality assurance system (IQAS) cannot function effectively without building a technologically verified monitoring system. The innovativeness of the approach lies in the transition from ascertaining control (fixing a section of knowledge at a certain stage) to monitoring of an anticipatory and developmental type. The management of the institution, relying on educational measurement methods, gets the opportunity to collect large arrays of objective data according to various descriptors: the level of educational achievements of applicants, the degree of satisfaction of stakeholders, the level of digital competence of teachers, the state of the material and technical base [26].

Processing of this data using information and computer technologies (ICT) allows implementing a management model based on accurate data (Data-driven decision making), which minimizes the influence of the subjective factor on the part of the administration. O. Lyashenko emphasizes in his research, systematic management monitoring acts as a guarantor of compliance with academic standards and allows for timely identification of risks of a decrease in the quality of education

(for example, gaps in knowledge due to distance learning) and prompt correction of the educational process by redistributing resources or modernizing the content of disciplines [27].

In parallel with monitoring the internal environment, modern management of an educational institution in a market economy and autonomization requires the active use of strategic marketing tools. The issues of forming a marketing culture of educational management and researching the educational services market are covered in detail in the scientific work of T. V. Obolenskaya [31].

According to T. Obolenskaya, a modern educational institution operates in conditions of fierce competition, which is exacerbated by demographic fluctuations and globalization processes (when Ukrainian applicants have direct access to European colleges and universities) [31]. Therefore, innovative management of the institution must necessarily include a marketing vector, which provides for:

– constant monitoring of external markets: studying the dynamics of the regional labor market, forecasting the emergence of new professions, analyzing employers' requirements for graduates' competencies;

– institution positioning (Branding): forming a unique value proposition (Unique Educational Proposition), promoting the institution's image through digital communication channels, demonstrating transparency and openness of the educational space;

– orientation to meeting the needs of stakeholders: transforming the content of education in accordance with the requests of direct customers (applicants and their parents) while maintaining state standards [31].

Ensuring high quality of the educational process and its compliance with international criteria is the ultimate goal and the main criterion for the effectiveness of implementing any management innovations in the coordinates of European integration.

In modern Ukrainian scientific and pedagogical thought, the paradigm of assessing this quality has undergone a radical transformation, having made a conceptual transition from the plane of subjective, mainly descriptive expert

judgments to the plane of precise scientific measurements, mathematical modeling and objective standardization, that is, to the subject field of educational qualimetry. Theoretical and methodological principles of systematic monitoring of the quality of educational activities, as well as the tools for objectifying pedagogical control, have been thoroughly developed and verified in the fundamental works of T. Lukina [26].

According to the methodological approaches of T. Lukina, the internal education quality assurance system (IESQA) of an institution is not able to function as a viable and adaptive mechanism without building a technologically verified, multi-level monitoring system. The innovation of this approach in the context of management modernization lies in the shift in emphasis from ascertaining, retrospective control (which only records a static cross-section of knowledge or violations at a certain stage) to monitoring of an anticipatory, developmental, prognostic type.

With such a vector, the institution's management, relying on valid methods of educational measurements, receives an instrumental opportunity to accumulate and analyze representative arrays of objective data according to an extensive system of descriptors and indicators. These include:

– dynamics and trajectory of educational achievements of education seekers;

– degree of satisfaction of internal and external stakeholders (students, parents, employers, graduates);

– level of digital and professional-managerial competence of scientific and pedagogical employees;

– condition and ergonomics of the material and technical, information and socio-cultural base of the institution [25].

Systematic processing of this heterogeneous data using modern information and computer technologies (ICT) and analytical platforms allows for the implementation of an advanced management model based on accurate, empirically confirmed data (Data-driven decision making). This minimizes the destructive influence of the subjective, voluntarist factor on the part of the administrative

apparatus and transfers management to a mode of transparency and academic integrity.

O. Lyashenko emphasizes in his research, systematic management monitoring acts as a strategic guarantor of compliance with state and European educational standards (ESG). It allows management to proactively identify latent risks of a decrease in the quality of educational services (in particular, systemic gaps in knowledge and competencies caused by the prolonged use of distance or blended learning) and promptly adjust the educational process through flexible redistribution of resources, optimization of the schedule or modernization of the content and architectonics of educational disciplines [27].

In parallel with monitoring the internal environment, modern architectural renovation of an educational institution in a market economy, deepening institutional autonomy and integration into the European Higher/Secondary Education Area (EHEA/EEA) requires the head to actively involve strategic marketing tools. The issues of forming a high marketing culture of educational management, diversifying sources of funding and studying the market conditions of educational services are covered in detail in the scientific work of T. Obolenskaya [31].

According to T. Obolenskaya, a modern domestic educational institution operates in an aggressive macroenvironment of fierce inter-institutional competition, which is significantly enhanced by complex demographic fluctuations, globalization processes and educational migration. Since modern Ukrainian applicants have unhindered direct access to European colleges and universities, domestic institutions are forced to compete for intellectual capital not only locally, but also internationally. Therefore, innovative management of a modern institution must necessarily contain a pronounced marketing vector, which involves the implementation of the following interrelated strategic directions:

– constant monitoring and scanning of external markets. This direction involves in-depth study of the dynamics of regional and national labor markets, predictive modeling of the emergence of new professions and qualifications, as well as a systematic analysis of current and prospective employer requirements for

professional and soft skills of graduates with the aim of their prompt integration into educational programs;

– strategic positioning of the institution and educational branding. The process involves the careful formation of a unique value proposition of the institution (Unique Educational Proposition), which would clearly differentiate it among competitors. The promotion of a positive and progressive image of the institution is carried out through modern digital communication channels (social media, targeting, web resources), demonstrating to the international and domestic community a high level of transparency, inclusiveness and openness of the internal educational space;

– orientation to full satisfaction of stakeholders' needs. This vector requires flexible transformation of the architecture and content of education in accordance with the rational requests of direct customers (applicants and their parents) under the mandatory condition of strict maintenance and exceeding of state standards [31].

Thus, qualimetric support and marketing strategy should not be considered as autonomous or purely auxiliary elements of administration. Within the framework of modernization of management of an educational institution in the conditions of European integration, they are transformed into complementary tools of a single management cycle. Qualimetrics provides managers with reliable internal metrics and objective knowledge about the real state of the institution, while marketing equips with an optimized strategy of external interaction, which in synergy guarantees sustainable viability, high competitiveness and innovative progress of the educational organization.

A logical continuation of the analysis of innovative management is the study of its interaction with state institutions and civil society.

Modernization of management cannot be confined exclusively within the framework of a separate educational institution – it is a component of a national strategy. In the works of V. Andrushchenko it is emphasized that the integration of Ukraine into the European educational space (in particular, the implementation of the requirements of the Bologna process and ESG standards) requires a radical transition to models of state and public management [2].

This approach involves the erosion of the state's monopoly on strategic decision-making in the educational sphere. Innovation is manifested in the active involvement of public organizations, employer associations, charitable foundations and parent communities in direct co-financing, material and technical support and expert assessment of the activities of an educational institution. The state takes on the role of a regulator and partner, which, through mechanisms of grant support, independent accreditation (in particular, through the activities of the State Service for the Quality of Education or NAZAVO) and regulatory and legal support, stimulates institutions to continuous self-improvement.

The expansion of the state-public vector in the context of European integration requires the introduction of tools of social dialogue and decentralization, where the key element is the autonomy of the educational institution - financial, academic and personnel. The process of decentralization of management, which is in harmony with the European principles of subsidiarity, transfers the center of responsibility directly to the level of the educational institution and its supervisory (trustee) boards. This allows the institution to promptly respond to local socio-cultural demands of the community and at the same time maintain a high level of compliance with European quality descriptors. Thus, the state-public model transforms external control into a system of internal self-governance, where each institutional entity (from the rector/director to the representative of student/pupil self-government and business partner) bears joint responsibility for the quality of the educational product.

Systematization of scientific views of Ukrainian researchers allows us to assert that management of an educational institution based on innovative approaches is a multidimensional, integral process. It harmoniously combines:

– philosophy of humanism (V. Kremen);

– methodology of adaptability and subject-subject interaction (G. El'nikova);

– systemic restructuring of management functions (V. Maslov);

– psychological safety and work deformation (L. Karamushka);

– qualimetric objectivity of quality monitoring (T. Lukina, O. Lyashenko);

– marketing proactivity in a competitive environment (T. Obolenska).

The implementation of this comprehensive approach is the only possible way to ensure high quality of the educational process and the advanced development of the national education system in European integration coordinates.

Continuing the outlined conceptual line, it is logical to move on to the analysis of the direct technological tools and organizational mechanisms that ensure the practical implementation of the above approaches at the level of everyday life of a modern educational institution. First of all, it is about the institutionalization of digital management platforms and smart management models, which are the material embodiment of the theoretical principles of adaptive and qualimetric approaches. The introduction of automated educational process management systems (ACS) allows you to translate routine administrative procedures into a transparent digital format, significantly minimizing the time spent by managers and overcoming the above-mentioned problem of total bureaucracy.

In addition to digitalization, project management is an effective organizational mechanism for modernization. The formation of temporary creative or research groups (teams) for specific European integration tasks – such as the development of joint educational programs with European partners, participation in Erasmus+grant projects, or the implementation of dual education – allows you to destroy the rigid linear-functional management structure. The project approach visualizes subject-subject interaction in practice: it delegates real powers to teachers and scientists, stimulates their leadership, and ensures a flexible, adaptive team response to any external challenges.

The integrated use of digital technologies, strategic marketing tools, qualimetric control, and project tools within the state-public model allows us to translate the theoretical matrix of innovation management into an applied plane. This creates a reliable management foundation that can ensure not just the formal presence of domestic educational institutions in the European space, but their real institutional competitiveness, dynamic development, and leadership positions in the knowledge society.

The practical implementation of a synergistic management model that combines adaptability, human-centeredness, and qualimetric monitoring requires the development of clear organizational and managerial mechanisms for the institutionalization of innovations. As researcher L. Hrynevych rightly notes in her works, the transition of an educational institution to a mode of advanced development is impossible without a systematic update of its internal regulatory, legal, and technological basis. The key tool here is the full autonomy of the institution, which transforms academic freedom from a theoretical slogan into real management practice. According to L. Hrynevych, it is the diversification of funding sources, the right to independently form educational programs and personnel policies that create the necessary room for maneuver in which the head can act as a proactive crisis manager [9].

In modern conditions, the digital transformation of the management circuit is of particular importance. The issues of integrating information and communication technologies and artificial intelligence into the educational management system are thoroughly investigated in his works V. Bykov [5].

Based on the concept of an open educational and scientific environment, substantiated by V. Bykov, innovative management of an educational institution today is based on the deployment of cloud-based learning management systems (LMS) and complex administration automation platforms (ERP systems) [5]. The implementation of digital ecosystems allows:

– optimize document flow: minimizing paper routine directly reduces the level of bureaucratic burden on the teacher, which, as noted above in the context of L. Karamushka's research, is a basic condition for preventing professional burnout [17];

– demystify monitoring: digital tracks of education seekers and teachers allow accumulating objective data for qualimetric analysis (according to the methodology of T. Lukina) without involving the subjective human factor, ensuring maximum transparency of internal audit [26];

– personalize educational trajectories: the use of big data algorithms and artificial intelligence elements allows management and teaching staff to perform predictive (prognostic) analysis of student success, timely adjusting the content of education to the individual needs of the individual, which fully corresponds to the philosophy of humanocentrism of V. Kremen [23, p. 4].

Any process of modernization and deformation of the management structure inevitably encounters the phenomenon of organizational resistance from the conservative part of the team. Theoretical understanding and practical recommendations for overcoming this barrier in the Ukrainian educational space are presented in the scientific work of O. Marmazy [29].

Analyzing the phenomenon of Change Leadership in education, O. Marmaza emphasizes that the head of an innovative institution must have a high level of strategic and emotional competence [28]. Overcoming resistance to innovation under such a model occurs not through administrative pressure or repressive control measures, but through the development of a corporate culture of trust and involvement. O. Marmaza suggests implementing technologies of internal coaching, reflective sessions and strategic sessions, where each member of the team becomes a co-author of a management decision. This allows transforming the psychological attitude of the teacher from the position of «someone else's things are imposed on me» to the position of «I implement my own idea», which radically increases the motivation for self-education and creative saturation of the educational process [28].

Thus, innovative management of an educational institution appears as a holistic, high-tech and at the same time deeply humanistic system. The modernization vector, set by the European integration aspirations of Ukraine, requires from the modern education manager a harmonious combination of cloud technology tools (V. Bykov), strategic autonomy (L. Grynevych) and soft skills of facilitative leadership (O. Marmaza). Only under the condition of such integration it becomes possible to achieve a sustainable quality of the educational process, capable of withstanding any global and local challenges of modernity [3; 9; 29].

Continuing the development of the architectonics of our research, it is logical to move on to the analysis of the acmeological and praxeological (practical and activity) dimensions of innovative management. The effectiveness of modernization processes in an educational institution directly depends on how managerial innovations are transformed into specific models of the teacher's professional ascent and new formats of interaction with stakeholders.

In the context of the paradigmatic transition from reproductive administration to proactive management, the acmeological approach (oriented to achieving the pinnacle of professional mastery) acquires special importance. V. Ognev'yuk thoroughly proves in her works, the quality of the educational process is derived from the level of spiritual, intellectual and professional development of the teacher himself. Innovative management, according to V. Ognev'yuk, should be oriented towards the concept of «enlightenmentology» – an integrative scientific direction that considers education as a holistic social phenomenon, where management decisions are designed to maximize the life-creating potential of each individual. The head of an educational institution in this coordinate system acts not as a controller, but as an architect of the acmeological space, which stimulates teachers to continuous self-improvement, scientific research, and professional reflection [32].

Acmeological ideas about the essence of the productive self-concept of the developing personality of a teacher are based mainly on the analysis of the personal and professional development of teachers of the new generation. Studies have proven that for the development of a productive self-concept, the following are necessary: gnostic skills (first of all, to analyze the pedagogical situation, the characteristics of subjects and objects of pedagogical activity and interactions); design skills (to adequately imagine the existing cause-and-effect and functional relationships in pedagogical reality); constructive skills(build and adjust a system of behavioral, activity and relationship strategies in the student environment); communicative skills (establish, implement and adjust relationships in the «student-student», «student-teacher» system, etc., regulate interpersonal relationships, establish emotionally

positive contacts, influence behavior and relationships in the student team); reflective skills (respond adequately to the situation and subjects of interaction), etc.

The self-concept of the individual is quite dynamic, and sometimes contradictory, but with the development of the professionalism of the teacher's personality, its components are harmonized, acquire a progressive stimulating character. The productive image of the professional self is precisely distinguished by the congruence of the real, ideal and fantastic «I», the formed image of the «I» affects the characteristics of the individual's self-esteem and the idea of one's own status.

Thus, conceptually from the acmeological position, the development of a professional teacher can be presented as a process and result of systemic transformations of a developing personality, which includes interrelated progressive changes in the following basic properties, which are formally considered as subsystems: professionalism in activity, professionalism of the personality, normativity of activity and behavior, productive self-concept. The implementation of the concept of professional development allows the teacher to reach an acmeological level, which will increase as professionalism grows and requires the creation of an appropriate acmeological environment.

The acmeological environment of an educational institution (AS) is a purposefully constructed space in which the educational process and scientific and research activities are carried out, the necessary and sufficient conditions are created for its participants to self-realize their creative potential on the way to higher achievements and perfection. Reflecting a developmental, humanistic paradigm, the center of the acmeological environment should be the subjects of the pedagogical process (teachers-researchers, creatively oriented students, undergraduates, postgraduates, doctoral students), for the sake of which the AS is created, exists and develops, in the interests of which the AS should be studied.

Developing this idea in a praxeological aspect, researcher L. Danylenko justifies the technologization of innovative educational management. According to L. Danylenko, the modernization of educational institution management involves the mandatory implementation of monitoring and personalized technologies for

supporting the professional growth of personnel. Instead of unified, directively imposed advanced training courses, modern management offers the teacher the tools of individual educational consulting [12].

The implementation of such tools ensures the formation of innovative competence of the teacher/lecturer, which contains several strategic components:

– cognitive-technological: the ability to freely operate with modern educational trends (from STEM education to inclusive practices) and artificial intelligence tools in teaching;

– motivational-value: internal readiness to move away from patterns, perception of creativity as the leading criterion for the success of the lesson.

– adaptive-reflexive: the ability to critically evaluate one's own activities based on internal qualimetric monitoring data (according to T. Lukina) and to promptly restructure the methodological system to meet the needs of a specific student or pupil audience [25].

The final trajectory of modernization of the management of an educational institution in the context of European integration inevitably reaches the level of building a sustainable state-public interaction. Investigating the problems of social partnership in education, Ukrainian scientist N. Ostroverkhova emphasizes the importance of deploying participatory (joint) management. According to N. Ostroverkhova, the innovative approach consists in the transition from mono-subject management to poly-subject management, where the right to form the educational policy of the institution and assess its quality is delegated to internal and external stakeholders [33].

This vector is practically implemented through the creation and real functioning of collegial institutions of a new type: employers' councils, trustees' and supervisory boards with the involvement of public opinion leaders, business representatives and graduates of the institution. Based on the conceptual principles of public administration developed by T. Obolenskaya [31] and V. Andrushchenko [2], participatory management provides the educational institution with additional strategic advantages:

– social validation of educational standards: the content of variable components of educational programs is directly adjusted in accordance with the requirements of employers, which closes the gap between theoretical training and the real needs of the labor market;

– attracting additional investment and intellectual resources: social partnership paves the way for dual education, the creation of joint research laboratories, hackathons and business incubators on the basis of the institution;

– increasing institutional trust (Social Trust): openness of qualimetric data and marketing transparency of the institution minimize corruption risks and capitalize on its reputational brand in society.

Thus, the logical continuation of the study of the phenomenon of innovative management of an educational institution in the context of European integration transformations proves that the modernization of management is not just a technical update of administrative tools, but a deep socio-cultural process. The synergistic combination of acmeological potential (V. Ognev'yuk) [32], technological clarity of personnel support (L. Danylenko) [12], and multi-subject participation (N. Ostroverkhova) [33] creates a reliable foundation for sustainable quality assurance of the educational process, transforming a modern educational institution into a dynamic and competitive center of the knowledge society.

Continuing the in-depth analysis of the architectonics of innovation management, it is necessary to shift the focus of the research to the study of the patterns of formation of the internal quality culture (Quality Culture) and reflexive mechanisms of self-organization of the institution. The current stage of reforming the industry proves that institutional and technological innovations remain formal tools if they are not integrated into the value-normative matrix of the life of the educational community.

Within the framework of the implementation of the modern European integration vector of development of the domestic education system, a fundamental reconceptualization of management approaches is taking place. The paradigm of strict «quality control», which was traditionally based on external inspection,

recording deviations from standards and imperative pressure, is finally giving way to the synergistic paradigm of «quality management». The latter is directly determined by the process of building and long-term functioning of an authentic internal culture of quality in each individual subject of educational activity.

Phenomenological analysis of quality culture allows us to consider it not simply as a set of formal procedures or regulations, but as a complex value-normative regulator that is integrated into the socio-cultural space of an educational institution. This phenomenon encompasses mental attitudes, value orientations, academic culture, and everyday practice of all participants in the educational process.

S. Kvit reasonably notes in his sociological and pedagogical research, quality culture is, by its essential nature, an endogenous (internal) construct, and therefore it cannot be artificially imported, mechanically borrowed, or introduced exclusively in an imperative (prescriptive) manner by administrative bodies or top management [18]. It emerges as a product of a long, systemic internal evolution of an educational institution, the result of a deep consensus between management, academic (professorship and teaching) staff, and higher education students regarding basic, axiologically significant guidelines. S. Kvit includes the following fundamental academic values:

– academic integrity – as an imperative of honesty, openness and prevention of any manifestations of plagiarism or falsification;

– transparency – which minimizes corruption risks and ensures clarity of management decisions;

– mutual respect and trust – as a horizontal basis for constructive dialogue between generations of scientists and students;

– professional responsibility – which implies the awareness by each subject of the importance of their contribution to the overall result [18].

According to the conceptual provisions of S. Kvit, innovative management of an educational institution in modern dynamic conditions of institutional autonomy consists in the consistent transformation of reputational capital into the main strategic driver and resource of sustainable development. With this approach, responsibility is

decentralized: each subject of the educational process ceases to be a passive object of control, and instead transforms into an active associate who is clearly aware of his own personal involvement in the design, implementation and monitoring of the final educational result [18].

In the praxeological (practical-activity) dimension, the architecture of the internal education quality assurance system (EQAS) is a complex multi-level framework. It requires specific, adaptive, and at the same time operationalized tools capable of converting the high strategic goals of the institution (mission, vision) into the everyday professional activities of an individual lecturer, department, or school teacher.

Investigating the theoretical and methodological principles of designing and modernizing modern educational systems, scientist O. Lokshina emphasizes the urgent need to move away from outdated technocratic assessment methods and justifies the importance of implementing innovative competency-based audit [24]. Innovative management under such a reflective model radically changes its vectors: it abandons the formal, mechanical calculation of gross quantitative indicators of activity (such as the total number of classroom lessons held, the volume of written and submitted paper reports, and the purely formal implementation of plans) in favor of deep qualitative analysis.

The focus of managerial attention according to the methodology of O. Lokshina is: the real increase in integral, general and special (professional) competencies of education seekers; the trajectory and dynamics of the development of the teacher's professional profile, his readiness for innovation and self-improvement; the ability of the educational environment to stimulate critical thinking and creativity [24].

The approaches developed by O. Lokshina to the comparative analysis of educational strategies of the European Union countries convincingly prove that the leading and most productive European trend is the systemic transition from total external supervision to decentralized self-evaluation of the institution's structural units.

The implementation of self-assessment practices acts as a powerful catalyst for internal changes, as it stimulates the development of managerial independence, subjectivity and initiative of grassroots levels (departments, faculties, cycle commissions). This allows transforming internal monitoring from a punitive and fixing tool into an effective mechanism for strategic self-development and continuous improvement, which is the core essence of the phenomenon of quality culture in modern educational management.

The transition to innovative management of an educational institution requires a radical restructuring of the traditional system of advanced training and stimulation of teachers' work. The issues of developing human resources and acmeological support for pedagogical activity in Ukraine are thoroughly addressed by the scientific school of N. Guziy [10].

Based on the concept of professional competence and pedagogical action, substantiated by N. Guziy, innovative management departs from formal, unified approaches to assessing human capital. The modern quality management system integrates the latest praxeological technologies, among which a special place is occupied by:

– educational Grading System: development of a flexible matrix of job salaries and incentive payments, based not on length of service, but on the real qualimetric profile of the teacher (publication activity, results of the anonymous survey of applicants «Teacher through the eyes of students», development of author's digital courses);

– management and pedagogical mentoring (Mentoring): creating a new type of mentoring institute, where experienced professors act as facilitators for young assistants, helping them adapt to the requirements of digitalization and minimizing the risks of early professional burnout (according to L. Karamushka);

– educational Coaching: the leader's orientation towards revealing the inner potential of each employee. The coaching approach, unlike the directive one, encourages the teacher to independently search for creative solutions, which increases his professional subjectivity and self-motivation [10].

As N. Huziy emphasizes in his research, the institutionalization of these tools allows transforming the internal environment of the institution from a competitive one (where teachers act in isolation) to a collaborative one (a space of mutual support and team creativity).

The rapid deployment of digitalization processes, bordering on a radical change in social paradigms, as well as the imperative need for educational institutions to function in conditions of prolonged, unpredictable crisis challenges (from pandemic restrictions to security threats) create an urgent need for reengineering of management processes. In this context, reengineering is viewed not as cosmetic optimization or incremental improvement, but as a radical rethinking, fundamental restructuring, and design of an educational institution's business processes «from scratch» to achieve a leapfrog increase in efficiency, adaptability, and quality.

Fundamental research in the field of transformation of didactic and management systems under the influence of cloud technologies is actively carried out by the scientific school under the leadership of O. Spirin. The works of this school lay the methodological basis for the transition from traditional, static administration to dynamic, high-tech knowledge management.

Developing theoretical and praxeological theses on the digital educational environment, O. Spirin notes that modern management of educational quality can no longer be limited to the framework of local or exclusively remote solutions. It must operate with the concept of hybridization of the educational space [35].

Hybridization of the educational space is not just the sum of face-to-face and distance learning, but the creation of a holistic, seamless ecosystem, where physical and virtual spaces interpenetrate, complement each other and exist synergistically [35].

This means that the management circuit of the institution should function as a flexible matrix system. It should simultaneously ensure stability, continuity and complete identity of the quality of educational services regardless of where the subject of the educational process (student or teacher) is physically and

geographically located – in a physical classroom, at a computer screen in remote synchronous mode or in an individual trajectory of asynchronous interaction.

According to O. Spirin [35], radical reengineering of the processes of the internal education quality assurance system (EQAS) based on innovative approaches and cloud-based solutions should be carried out along the following key vectors:

1. Automation of content expertise. Traditional manual monitoring of educational and methodological support (syllabi, educational programs, lecture notes) in the conditions of large data sets becomes ineffective and creates excessive bureaucratic burden. Reengineering involves the implementation of cloud services based on artificial intelligence (AI) for primary, intelligent analysis of digital content.

Artificial intelligence algorithms are able to automatically assess:

– compliance of syllabuses and test bases with the criteria of state standards and descriptors of qualification framework levels;

– texts of electronic textbooks and manuals for compliance with the principles of academic integrity (detection of not only text borrowings, but also semantic plagiarism or generative AI content without proper marking);

– validity and differential ability of test tasks based on psychometric analysis.

This frees up human resources of experts for deep substantive and value analysis, eliminating the subjective factor at the stage of routine verification.

2. Optimization of resource logistics. The hybrid space requires instant response to changing external circumstances. Reengineering in this area consists in the transition from static (semester) planning to dynamic management of the institution's resources using integrated ERP systems (Enterprise Resource Planning).

The ERP-based management circuit allows for real-time balancing and redistribution of three critical components:

– classroom capacity: rapid transformation of the schedule to meet the needs of streaming or small-group classes, taking into account the capacity of shelters or sanitary requirements;

– human resources: dynamic workload of teachers, accounting for their working hours in different modes (face-to-face/remote);

– technology stack: automatic scaling of server capacity and bandwidth of cloud platforms during peak loads (for example, during the session).

Such digital logistics make it impossible to have a managerial and infrastructural collapse in the event of a sudden (force majeure) transition from one format of education to another, guaranteeing the viability of the organization.

3. Creation of digital repositories of best practices. In conditions of isolation or territorial dispersion of teachers, there is a risk of the teacher becoming locked in his own experience, which slows down the development of the institution as a whole. Reengineering destroys these barriers by creating intelligent digital repositories – repositories, which are not just file archives, but dynamic knowledge bases [35].

They provide managers and teachers with free, fast and intuitive access to accumulated internal innovative experience: from successful cases of gamification of learning to digital assessment tools. The creation of such repositories significantly accelerates the diffusion (spread) of innovations within the organization. An innovative methodology invented by one teacher, thanks to digital capital transport, becomes the property of the entire team in a matter of days, transforming the educational institution into a «learning organization».

Thus, reengineering of management processes according to the methodology of the scientific school of O. Spirin transforms the All-Ukrainian State Committee for Quality Assurance from a regulatory body to a catalyst for development, which allows an educational institution not only to survive in turbulent conditions, but also to set quality standards in a new, hybrid educational dimension [35].

Ensuring high quality of the educational process cannot be done in isolation from pan-European and global trends. To achieve compliance with ESG 2015 standards, modern management of educational institutions must actively apply the methodology of benchmarking (systematic comparative analysis of their own activities with the best world examples). The theoretical and methodological principles of internationalization of educational systems and comparative pedagogy are thoroughly studied in the works of N. Bidyuk [6].

The application of benchmarking in the innovative management of an educational institution, according to the conceptual approaches of N. Bidyuk, is deployed in several strategic areas:

[Strategic benchmarking] → Comparison of the models of the Ukrainian National University of Quality Assurance with European partner universities.

[Process benchmarking] → Optimization of internal document flow according to ISO/ESG standards.

[Performance benchmarking] → Adjustment of KPIs of teachers according to world rankings (QS/THE).

Figure 1 – Application of benchmarking in the innovative management of an educational institution, systematized by the author on the concepts of N. Bidyuk

Internationalization, according to N. Bidyuk [6], is not just an external attribute (the presence of foreign students or signed memoranda), but a deep internal transformer of managerial culture. It stimulates the manager to implement English-language educational programs, develop virtual academic mobility and involve international experts in the external independent audit of the institution. This allows overcoming mental provincialism and integrating domestic educational institutions into the global scientific and educational space as equal and competitive subjects.

For the practical implementation of the innovation management model substantiated in the monograph, a clear algorithm of actions is proposed for the management of educational institutions (directors, rectors, heads of specialized departments):

– diagnostics and audit stage: Conducting a comprehensive marketing research of the external market (according to T. Obolenskaya) and an internal qualimetric cross-section (according to T. Lukina). Determining the real level of professional burnout of the team using the methods of L. Karamushka;

– stage of digital transformation: Transfer of administration processes and VZQAO to cloud platforms (according to the concept of V. Bykov and O. Spirin). Creation of a single digital dean's office / teacher's office to eliminate bureaucratic burden;

– stage of building a quality culture: Conducting strategic sessions, coaching trainings and reflective seminars (according to O. Marmaza and T. Sorochan). Formation of the Code of Academic Integrity of the institution as a value basis of the internal environment;

– stage of participatory deployment: Reformatting of supervisory and academic councils with mandatory involvement of representatives of stakeholders, employers and student self-government (according to N. Ostroverkhova). Launch of dual and hybrid education programs.

No managerial innovation can be successfully implemented without proper resource and financial and economic support. In the context of the decentralization reform and European integration requirements, the key factor in modernization is the transition from budget financing to full financial autonomy of the institution. Comprehensive studies of financial and economic relations and innovative financing models in the educational sphere of Ukraine are carried out by the scientific school of V. Glukhova [8].

Based on the conceptual approaches of V. Glukhova, innovative management of financial resources in conditions of market competition requires the head of the institution to transform from a classic allocator of budget funds to a proactive financial director and strategist. Financial autonomy, according to V. Glukhova, is revealed through the following management tools:

– multi-source funding: diversification of sources of capital through active development of paid services, creation of an ecosystem of scientific and industrial entrepreneurship and commercialization of the results of intellectual work of teachers (patents, author's methods);

– institutionalization of fundraising: creation of specialized project offices to attract international grants (Erasmus+, Horizon Europe), charitable contributions and investments from the corporate sector;

– program-targeted budgeting: transition from linear financing of expense items to budgeting of specific innovative projects (for example, creating a digital laboratory or launching a new certificate program). Each project is evaluated

according to the criterion of profitability and direct impact on the quality of the educational process [8].

Management based on financial autonomy allows optimizing the staffing of the institution through mechanisms of flexible bonuses and individual financial incentives for creative leaders of the team, which directly correlates with the theses of N. Guziy and L. Karamushka [10; 16].

Innovative management of an educational institution is not a closed system; its effectiveness must be constantly verified through external independent assessment tools. The creation of a national architecture for ensuring the quality of education and the methodology for conducting institutional audits have been thoroughly researched in the scientific works of R. Hurak [11].

According to R. Hurak, modern state supervision (control) in education has radically changed its vector: from repressive and punitive inspections, the system has moved to the format of management consulting and support. Institutional audit, conducted by the State Service for the Quality of Education (SSEQE), acts as an external mirror for the internal quality assurance system of the institution [11]. An innovative approach to the interaction of an educational institution with state supervision bodies involves:

[Internal Self-Evaluation]
|
▼ (Process Correction according to PDCA)
[External Institutional Audit (DQAA)]
|
▼ (Management Recommendations)
[Brand Capitalization and Access to the European Level]

Figure 2 – An Innovative Approach to the Interaction of an Educational Institution with State Supervisory Authorities, Systematized by the Author Based on the Concepts of R. Hurak

As R. Gurak emphasizes [11], the successful completion of an institutional audit is confirmation that the integrative model of innovative management

substantiated by us functions effectively. The audit assesses four basic areas of the institution's activity: the educational environment, the system of assessing applicants (according to T. Lukina) [25], pedagogical activity (according to N. Guziy) [10] and management processes (according to G. El'nikova) [1]. Thus, external audit is not a destructive factor, but a strategic driver that helps management verify the correctness of the chosen modernization course and adjust the trajectory of the institution's institutional development in European integration coordinates.

Concluding a detailed analysis of modernization processes, it is necessary to emphasize that the final product of innovation management is the formation of a high level of organizational resilience (viability) of an educational institution. Investigating strategic planning in conditions of global and local turbulence, Ukrainian scientist O. Topuzov notes that innovation management should turn into a process of continuous strategizing [36].

According to O. Topuzov, strategizing is not just writing a static document «Development Strategy for 5 Years», but a dynamic management practice that involves weekly reflective analysis of external environment markers, constant communication with stakeholders, and readiness for instant reformatting of tactical tasks to preserve the main goal – human-centered development of the individual in a safe and high-quality educational space [36].

A comprehensive presentation of the main material of the monograph allows us to form the final scientific picture of the study. The modernization of the management of an educational institution appears not as a local update of individual administrative functions, but as a large-scale, paradigmatic restructuring of the entire educational system on the principles of innovation, European integration, and humanism.

The analysis made it possible to combine the fundamental achievements of Ukrainian scientific thought into a single conceptual matrix:

– philosophical level: the idea of human-centeredness of the knowledge society (V. Kremen, V. Andrushchenko);

– methodological level: concepts of adaptive management (G. Yelnikova), systems management (V. Maslov) and osvitology (V. Ognev'yuk);

– technological and digital level: models of cloud-oriented systems and the digital environment (V. Bykov, O. Spirin);

– qualimetric and diagnostic level: educational monitoring technologies (T. Lukina, O. Lyashenko) and external quality audit (R. Gurak);

– psychological and personnel level: principles of participatory management, burnout prevention and acmeology of work (L. Karamushka, N. Guziy, O. Marmaza);

– marketing and economic level: tools of market positioning (T. Obolenska) and financial autonomy (V. Glukhova).

This extensive scientific toolkit provides a reliable theoretical and praxeological foundation for new generation leaders capable of ensuring consistently high quality of the educational process, competitiveness of domestic institutions, and successful integration of Ukraine into the European knowledge space.

Modernization of educational institution management in conditions of permanent social crisis requires implementation of risk management methodology as a cross-cutting component of the overall development strategy. Theoretical and methodological principles of adaptation of social and educational systems to conditions of high uncertainty are thoroughly studied in the works of L. Grynevych. Developing the concept of institutional resilience, the researcher proves that modern educational management should move away from a reactive model (responding to a crisis that has already occurred) to a proactive risk-protected architecture [9].

Within the framework of our study, we classify the key risks of innovative development of an educational institution into four macrogroups:

– institutional (academic) risks: reduction in the quality of knowledge due to forced asynchrony of learning, threats of devaluation of grades and manifestations of academic dishonesty;

– technological (digital) risks: vulnerability of the institution's cloud infrastructure to cyberattacks, digital inequality among applicants, shortage of licensed software for simulation laboratories;

– psychosocial (human resources) risks: emotional burnout of innovation leaders, team resistance to innovation (neophobia), loss of key specialists due to migration processes;

– resource (financial and economic) risks: cash gaps in conditions of financial autonomy, underfunding of experimental areas, ineffectiveness of fundraising campaigns.

The introduction of innovative risk management involves the creation of a Risk Register in the institution with a clear definition of the probability matrix and trigger maps (indicators of approaching the critical limit). This allows transforming the internal environment of the institution from a crisis environment into a resilient one – one capable of not only withstanding external shocks, but also using crisis points as an impulse for systemic self-renewal.

In conditions of market competition and expansion of autonomy, the quality of the educational process is directly converted into the reputational capital of the organization. The theoretical basis of marketing and the formation of reputational strategies in the domestic educational space was laid by the scientific school of T. Obolenskaya. An innovative approach to brand management considers the reputation of an institution not as an ephemeral sociological category, but as a specific intangible asset that is subject to capitalization and directly affects the attraction of intellectual and financial resources [31].

According to T. Obolenskaya, the structure of the reputational potential of an educational institution integrates three key vectors of perception (Table 1):

Modernization of management in this context requires a transition from classic information (covering news on the website) to strategic communications (Strategic Communications). An innovative manager applies content marketing technologies, conducts a proactive dialogue with stakeholders through digital ecosystems and forms the brand of the institution as a unique scientific and educational center, which guarantees the life success of the graduate. This provides the institution with a stable position in national rankings (for example, «Top-200 Ukraine») and opens the way to the global educational space.

Table 1 – Structure of the reputational potential of an educational institution

Vector image	Target audience	The main management tool
Internal image	Faculty, staff, applicants	Transparent QMS, corporate ethics, participatory governance
External local image	Employers, graduates, regional communities, media	Joint educational and industrial clusters, open scientific hubs
Global (international) image	Foreign partner institutions, international rating agencies	English-language programs, double degrees, citation index (Scopus/WoS)

Source: systematized by the author based on T. Obolenskaya

The quality of management of an educational institution is finally verified at the micro level – in the space of direct interaction between the teacher and the student. Innovative management cannot be limited to administrative transformations; its imperative is the design of advanced didactic content. The problems of modernization of educational content and technologization of learning are the subject of systematic research by O. Savchenko [34].

Developing the theoretical foundations of the competency approach, substantiated by O. Savchenko, we argue that the role of a modern manager is to manage the processes of diffusion (distribution and implementation) of pedagogical innovations. The administration must create a specific incubator of methodological ideas, which ensures the transition from reproductive technologies to innovative didactic models:

– heuristic and problem-based learning (PBL – Problem-Based Learning): rejection of the lecture monologue in favor of joint solving of real scientific or industrial cases;

– flexible individual educational trajectories (IEP): providing the applicant with a real, rather than declarative, right to choose elective courses, pace and form of mastering the material using LMS platforms (Moodle, Google Classroom);

– immersive learning technologies: integration of virtual (VR) and augmented (AR) reality elements into the educational process, which allows visualization of extremely complex physical, chemical, or anatomical processes without risk and significant financial costs [34].

The management task within the didactic contour is to overcome the professional conservatism of teachers through the system of soft coaching (according to N. Guziy) and financial incentives (according to V. Glukhova), transforming innovative methods into a standard of everyday pedagogical practice.

The final element that closes the contour of the internal system of ensuring the quality of education is an objective, valid and technological system for measuring educational achievements. The methodological principles of pedagogical qualimetry and monitoring the quality of education were developed in the Ukrainian scientific space by the school of T. Lukina [26].

The implementation of innovative approaches requires a decisive rejection of subjective, impressionistic assessment («by eye») in favor of Data-Driven Decision Making – management based on accurate, verified data. Qualimetric support of the VZQAO, built on the concepts of T. Lukina, involves the implementation of four sequential procedures:

1. Standardization of the toolkit: development of criterion-referenced tests with high reliability and discriminativeness for each educational component.

2. Organization of an independent internal section: conducting computer testing in a cloud environment under the control of independent moderators (institution quality experts), which eliminates corruption risks and teaching subjectivity.

3. Predictive data analysis: application of mathematical statistics methods (correlation, regression and factor analysis) to identify hidden patterns (for example, the dependence of learning outcomes on the format of classes or the level of use of multimedia content).

4. Formation of a correction contour: based on the results of qualimetric analysis, management decisions are automatically made - from adjusting the content of work programs to sending individual teachers to digital competence improvement courses [26].

[Standardization of TK] → [Independent Section] → [Predictive Analysis] → [Correction Contour]

Figure 3 – Qualimetric support of the VZQAO, systematized by the author based on the concepts of T. Lukina

Thus, the use of T. Lukina's qualimetric tools transforms monitoring from a fixing tool to a predictive regulator of the quality of the entire educational system of the institution.

Generalizing the vectors of modernization, we must bring the scientific discourse to the level of strategic forecasting of the development of management systems. In the post-industrial era, innovative management evolves to the concept of Smart management, which combines high-tech solutions with the principles of ecologization, human-centeredness and sustainable development. Theoretical understanding of the processes of intellectualization of complex social systems is carried out within the framework of the domestic osvitological discourse, founded by V. Ognev'yuk [32].

Smart management of an educational institution within the framework of an educational approach involves the formation of a specific smart space (Smart Environment), where management algorithms are optimized using end-to-end technologies:

– Internet of Things (IoT) in infrastructure management: automatic regulation of the microclimate in classrooms (temperature, CO_2 level, lighting), which directly affects the cognitive abilities of students and ensures enormous energy efficiency of the institution within the framework of financial autonomy;

– blockchain technologies for verification of achievements: creation of decentralized registers for issuing diplomas, certificates and recording of internal audit results, which completely eliminates the threat of data falsification and raises institutional trust to the European level;

– ecological management culture (Green Management): complete rejection of paper document flow, education of environmental responsibility in the team,

formation of the institution as a space of psychological and physical well-being (Well-being) [32].

Developing the legacy of V. Ognev'yuk, we prove that Smart management allows us to overcome the eternal dualism between technologization and humanization of education. Innovative management of the new generation uses the technological power of digitalization not to robotize the process, but to free the manager and teacher from routine, leaving them space for creativity, mentoring, strategic thinking, and human-centered interaction.

The integrative model of innovative management of an educational institution substantiated in the monograph opens new horizons for further scientific explorations. Among the most relevant and promising areas that require further theoretical understanding and experimental verification, the following are highlighted:

– development of adaptive models of management of educational institutions in deoccupied and frontline regions of Ukraine: study of the specifics of psychosocial rehabilitation of collectives and restoration of damaged infrastructure based on risk management;

– methodology of integration of generative artificial intelligence into the contour of the All-Ukrainian State Educational Service: creation of regulatory and qualimetric models for assessing independent work of applicants in the AI era, development of AI consulting algorithms for the administration of the institution;

– comparative analysis of models of financial autonomy of educational institutions in Eastern Europe and Ukraine: optimization of mechanisms for the transfer of European technologies of grant activities and venture financing into the educational sphere;

– acmeological support of leaders of educational changes in conditions of long-term stress: development of systems of psychological support, coaching and prevention of professional deformation of the management staff of educational institutions.

The transition from linear-hierarchical structures of educational institution

management to flexible, adaptive systems actualizes the transformation of the role of the leader from a classical administrator to an innovative leader. Theoretical and methodological principles of the formation of leadership potential in the educational management system of Ukraine have been thoroughly studied in the works of L. Karamushka. Relying on psychological and pedagogical concepts of organizational management, the researcher proves that innovative leadership is a key facilitator (catalyst) of internal reform processes [16].

According to L. Karamushka, innovative leadership within the framework of participatory (everyone's participation in decision-making) management is revealed through the following dimensions:

– distributed Leadership: delegation of real managerial powers to heads of departments, cyclical commissions, project groups and student self-government bodies. This allows decentralizing responsibility and increasing the level of adaptability of the organization to changes;

– emotional intelligence of the leader (EQ): the leader's ability to recognize, understand and ecologically regulate the emotional states of team members in conditions of prolonged crisis tension, which directly reduces the level of organizational stress;

– team synergy: transformation of the pedagogical team from a formal structure into a cohesive «change team» (Change Team), where each subject has a high motivation for creative search and self-realization [16].

Modernization of management based on the concept of distributed leadership allows an educational institution to overcome internal hierarchical barriers and form a flexible network structure capable of promptly responding to the challenges of a dynamic socio-cultural environment.

Any innovative process in the educational sphere is inherently a destructive-constructive act that disrupts the usual homeostasis of the organization in order to reach a new level of functioning. However, the sociodynamic nature of an educational institution as a complex socio-pedagogical system reveals a natural tendency towards self-preservation, which inevitably causes resistance to any

innovations within the system. This phenomenon of resistance is due to deep psychological factors, among which the leading place is occupied by the professional conservatism of pedagogical personnel, based on many years of experience in successful reproductive activity. In addition, institutional changes are actualizing the phenomena of neophobia – an irrational fear of the unknown, loss of stability, or an imaginary decline in one's own professional status, which is reinforced by a chronic shortage of relevant information and destructive rumors at the initial stages of reengineering management processes.

In these coordinates, traditional directive management shows complete incapacity, since the forcible suppression of resistance only leads to the transition of the conflict into a latent phase, which provokes hidden sabotage of innovations and rapid professional burnout of the team. Therefore, an integral and critically important component of modern innovation management becomes a flexible system of anti-crisis mediation, conflict support and facilitation of changes.

Management activities under such conditions shift the emphasis from punitive and controlling functions to diagnostic and prognostic ones, where the conflict is viewed not as a destructive anomaly, but as a natural trigger for institutional renewal, which highlights the weaknesses of the existing system and stimulates the search for new consensus solutions.

The problems of conflict management, overcoming barriers to the perception of innovations, and optimizing the socio-psychological climate in educational teams are in the focus of attention of the scientific school of G. El'nikova. Investigating the laws of adaptive management in education, representatives of this scientific school substantiate the paradigm according to which the viability of an educational institution directly depends on its ability to flexibly respond to fluctuations in the external and internal environments through mechanisms of self-organization and participatory (joint) decision-making. The concept of adaptive management according to G. El'nikova involves the formation of such a management space, where the interaction between the manager and subordinates is built on parity, subject-

subject principles, which automatically reduces the level of anxiety in the team and minimizes the prerequisites for the emergence of interpersonal tension [1].

Adaptive monitoring systems occupy a special place in the architectonics of conflictological support developed within the framework of the mentioned scientific school. They act as a high-tech qualimetric toolkit, which allows for continuous, systematic and objective screening of the state of an educational organization.

Unlike classic inspections, adaptive monitoring is focused on proactively identifying areas of socio-psychological discomfort, deformations in communication networks, and the first signs of resistance to innovations. Thanks to the use of pedagogical qualimetry methods, the head of an educational institution receives not just a statement of facts, but a dynamic profile of the organization, which reflects the level of satisfaction of teachers with their work, the degree of their psychological readiness for the implementation of cloud technologies or artificial intelligence, as well as an index of team cohesion.

The effectiveness of anti-crisis mediation within the adaptive approach is ensured by the implementation of clear feedback algorithms. When monitoring systems record an increase in tension or a decrease in motivation, new generation management initiates conflict support procedures, which include:

– conducting facilitation sessions, where each subject of the educational process has the opportunity to verbalize their concerns;

– thorough information decompression, which eliminates the lack of knowledge about the purpose and stages of modernization;

– involving potential opponents of innovations in working groups for designing changes, which turns them from passive objects of management into active co-authors of the reform [1].

Thus, the implementation of the conceptual principles of the scientific school of G. El'nikova allows transforming intra-organizational conflicts from a destructive factor that destroys the integrity of the institution into a constructive resource for strategic development. Optimization of the socio-ecological environment of an educational institution based on adaptive monitoring and mediation ensures the

psychological safety of all participants in the educational process. This, in turn, creates a solid humanistic foundation for the painless assimilation of technological and didactic innovations, guaranteeing high quality of educational activities and overall resilience of the organization in the conditions of modern nonlinear civilizational progress.

Developing the theory of adaptive management, G. Elnikova notes that conflict in an innovative environment should be considered not as a destructive element, but as an indicator of the need for change and a source of organizational development [1].

Innovative conflict management involves the implementation of the following praxeological steps:

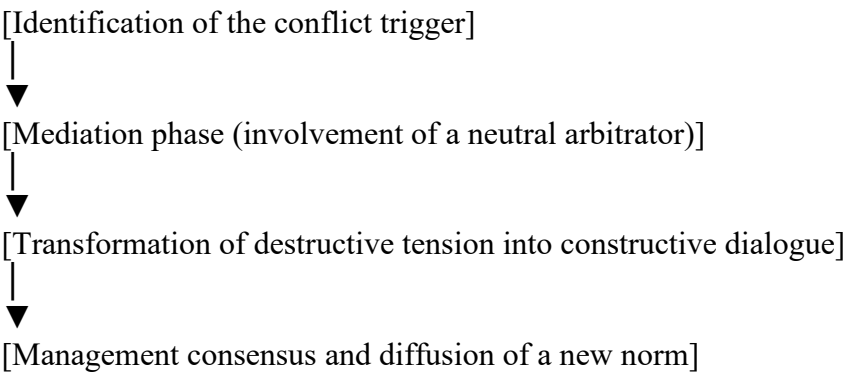

Figure 4 – Implementation of praxeological steps, systematized by the author according to G. Elnikova.

According to G. Elnikova, the task of an anti-crisis mediator (who is a manager or an invited expert) is to transfer the conflict from the interpersonal level to a constructive production level [1]. This allows to relieve social tension, identify hidden institutional problems and find an optimal solution that satisfies the interests of all stakeholders, ensuring the preservation of the internal resilience of the institution.

In the context of financial autonomy, substantiated in the works of V. Glukhova, and the rapid strengthening of the integration of science, education, and production, the innovative management of a modern higher education institution is objectively forced to go beyond traditional budget administration and master the latest technology transfer methodology [8]. Financial autonomy in this context is

viewed not simply as an extension of an institution's rights to manage funds, but as a fundamental tool for building an institution's economic self-sufficiency and institutional resilience. It serves as the basis for implementing the concept of an «entrepreneurial university», where the ability to independently generate and diversify financial flows is the main marker of competitiveness in the coordinates of the modern market of educational services and scientific developments.

The synergistic combination of financial independence with the imperatives of European integration actualizes the construction of sustainable connections in the triad «science – education – production». This process reflects the logic of the classic model of the «Triple Helix», where the university becomes not just a translator of ready-made knowledge, but the primary driver of the innovative development of society. Under such conditions, innovation management is transformed into a strategic partnership with stakeholders and business structures, aimed at commercializing the results of the intellectual activity of scientists and education seekers.

Mastering the technology transfer methodology requires the management of an educational institution to reengineer the entire internal organizational structure and create a specific infrastructure that ensures the full life cycle of innovation – from the fundamental idea to the market product. In the practical management plane, this is implemented through the development of the following institutional elements:

– technology transfer centers and intellectual property management offices: specialized units that provide legal protection, patenting, and qualitative assessment of the commercial potential of university scientists' developments;

– university startup incubators and science parks: venues where academics and students have the opportunity to convert theoretical knowledge into real business projects, using strategic fundraising and venture capital tools;

– cluster associations with high-tech production: creation of joint research laboratories, dual educational programs and ICT platforms, which allow for flexible adaptation of the vector of scientific research to the real breakthrough demands of modern industry [8].

Management activities based on the technology transfer methodology fundamentally change the philosophy of resource allocation within the institution. Funds received from the sale of science-intensive products, the provision of expert services, or royalties from patents, thanks to the mechanisms of financial autonomy according to V. Glukhova, are reinvested in the modernization of the cloud-oriented educational and scientific environment, advanced training of teachers, and stimulation of didactic creativity.

Thus, technology transfer becomes an effective financial and economic circuit that connects the humanistic guidelines of human-centrism with the real pragmatic challenges of post-industrial society. This allows an educational institution not only to gain economic freedom, but also to capitalize on its reputation brand, guaranteeing the advanced development and harmonious entry of domestic higher education into the world space of knowledge.

An educational institution must function not only as a translator of knowledge, but also as a subject of the intellectual property market. The theoretical and methodological principles of intellectual capital management and commercialization of scientific developments in the educational sphere of Ukraine are studied by the scientific school of Professor T. Obolenskaya [31].

The application of technology transfer tools in the innovative activities of the institution is deployed in the following strategic areas (Table 2):

Table 2 – Application of technology transfer tools in the innovative activities of the educational institution

Transfer component	The essence of the process	Target result
Intellectual property audit	Identification, inventory and legal protection of copyrighted methods, patents, and software created by educators	Formation of the institution's intangible assets portfolio
Academic entrepreneurship	Creation of startup incubators, small innovative enterprises and science parks on the basis of the institution	Attracting additional extra-budgetary financial flows
Commercialization of licenses	Selling rights to use copyrighted didactic content and simulation platforms to other institutions or the corporate sector	Brand capitalization and entry into the international technology market

Source: systematized by the author based on T. Obolenskaya

As T. Obolenska emphasizes, the development of academic entrepreneurship allows an institution to overcome financial dependence on the state budget, increase the level of material incentives for scientists, and ensure the real competitiveness of the organization in the coordinates of the global knowledge economy.

Completing the panoramic analysis of modernization processes, it is necessary to bring the research to the level of philosophical generalization. Innovative management cannot be reduced to a set of dry management matrices or digital algorithms; it requires a deep ideological justification. The problems of the philosophy of education, the anthropological dimensions of globalization and the strategic forecasting of human potential development are in the focus of the scientific school of V. Kremen [21].

Developing the concept of human centrism, V. Kremen emphasizes that the main goal of innovative management in the era of post-industrial society is the formation of strategic agility of the educational system. This implies the ability of an educational institution to instantly reformat its value, didactic and organizational dimensions in accordance with civilizational shifts. Innovative management in this context is based on the principles of:

– the priority of human-centeredness: any technological or organizational innovation (in particular, the implementation of AI or cloud systems according to V. Bykov) is evaluated exclusively by the criterion of its humanistic impact on the development of the applicant's personality and the well-being of the teacher;

– the anticipatory nature of education: management is focused not on meeting current, present-day demands of the labor market, but on the formation of future competencies (Future Skills), ensuring the graduate's readiness for life in unpredictable socio-cultural realities;

– greening thinking: forming in all subjects of the educational process a global responsibility for preserving the socio-natural environment and developing a culture of sustainable development [21].

Thus, philosophical and educational reflection according to V. Kremen allows us to combine all technological, financial and qualimetric contours of our research

into a holistic, human-centered and highly ethical system that guarantees the sustainable development of domestic education and its harmonious integration into the European and global space of knowledge.

In the context of the outlined paradigm, strategic agility acts not simply as an adaptive tool, but as a fundamental philosophical and managerial strategy that transforms the very nature of educational management. The transition from rigid, static management models to dynamic self-organizing systems allows educational institutions to overcome the challenges of the era of living knowledge. This requires a deeper explication of the above-mentioned principles of innovative management, which together form a new architectonics of the domestic educational space.

Developing the principle of the priority of human-centrism, it is worth emphasizing that the synergistic integration of V. Kremen's ideas regarding the anthropocentric dimension of progress and V. Bykov's concepts regarding a high-tech cloud-oriented environment makes it impossible to consider digitalization as an end in itself. In classical cybernetic management, the implementation of artificial intelligence (AI) or Big Data is often aimed at cost optimization or control automation. Instead, in the human-centric model of innovation management, digital tools are reinterpreted as a means of freeing a person from routine intellectual work, amplifying their creative potential, and creating personalized development trajectories. With this approach, the management of an educational institution evaluates the effectiveness of innovations through the prism of «digital well-being»: reducing the teacher's professional burnout and increasing the student's subjective sense of success.

The principle of the anticipatory nature of education in the post-industrial era transforms the predictive function of management. Traditional response to labor market demands (reactive management) is a priori outdated today due to the exponential rate of technological innovation. Strategic flexibility, which V. Kremen emphasizes, implies a transition to proactive (innovative) management, where didactic systems model future socio-cultural praxis. Future Skills – such as systems thinking, cognitive flexibility, emotional intelligence and the ability to continuously

retrain (lifelong learning) – are becoming cross-cutting guidelines for educational programs. The task of innovation management is to create an open, fractal educational environment that teaches the learner to act in conditions of high uncertainty (VUCA and BANI worlds), transforming crisis phenomena into triggers for personal growth [21].

In times of global transformations, the ecologization of thinking is of particular importance, which, within the framework of innovative management, grows beyond the framework of a purely academic discipline and becomes a cross-cutting philosophy of the life of an educational institution. Management focused on sustainable development forms a new ecosystem culture. It is based on the understanding of the indissoluble unity of technological progress, socio-cultural stability and biospheric balance. The head of an innovative educational institution considers the institution as a «green ecosystem» (both in the material and technical and mental dimensions), where each management step – from the choice of cloud servers to the construction of communication strategies – is verified by ethical criteria of global responsibility.

Thus, philosophical and educational reflection according to V. Kremen allows us to combine all technological, financial and qualimetric contours of our research into a holistic, human-centered and highly ethical system that guarantees the sustainable development of domestic education and its harmonious integration into the European and global space of knowledge.

The monographic study provides a comprehensive theoretical and methodological generalization and proposes a holistic solution to the current scientific and practical problem of modernizing the management of an educational institution based on innovative approaches.

Summarizing the logic of the development of our research, the finale of the scientific search appears not just as a dry list of points, but as a holistic worldview reflection that captures a fundamental paradigm shift in modern educational management.

The analysis proves that the era of rigid, reproductive administration and linear bureaucracy has finally exhausted its constructive resource under the pressure of global socio-cultural challenges and European integration imperatives. Today, the modernization of educational institution management goes far beyond the local updating of tools – it requires the development of a flexible, human-centered and high-tech ecosystem, where traditional control gives way to an authentic culture of quality.

The main synergistic effect of the proposed integrative Smart management model is revealed at the intersection of digital transformation and humanistic leadership. Freeing the educational space from bureaucratic pressure through process reengineering and cloud-based technologies becomes the basic impulse that eliminates professional burnout of pedagogical personnel and frees up space for didactic creativity. At the same time, the objectivity of this progress is rigorously verified by the transition to Data-Driven management, where pedagogical qualimetry and institutional audit tools of the State Education Quality Service transform monitoring from a punitive tool to a predictive regulator of the organization's development.

Ultimately, the viability and competitiveness of a modern educational institution in the coordinates of the turbulent BANI world are determined by the level of its organizational resilience, financial autonomy, and reputational brand capitalization. The involvement of strategic fundraising tools, technology transfer, and anti-crisis mediation allows transforming internal conflicts and external risks into drivers of institutional renewal. The philosophical understanding of this process through the prism of the idea of human centrism proves: innovative management of the new generation successfully combines high-tech solutions with the greening of thinking, guaranteeing not only the high quality of the educational process, but also the advanced development of the national education system in a single European knowledge space.

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3. Transformation of communication management in education: from traditional models to digital smart partnership

Modernization of the general secondary education system of Ukraine in the context of European integration processes and the implementation of the concept of «New Ukrainian School» requires a radical rethinking of the educational management paradigm. The current stage of development of the information society is characterized by the total digitalization of all spheres of human life, which causes the deconstruction of traditional, linear-bureaucratic management architectures. In these conditions, the phenomenon of communicative management moves from the plane of purely auxiliary organizational tools to the status of a basic strategic resource and an invariant component of the general managerial culture of the head of an educational institution [16]. Traditional models of communication in general secondary education institutions, oriented towards a vertical hierarchy («top-down») and overloaded with paper document flow, reveal their complete institutional inability to face the challenges of today (hybrid work formats, the need for rapid response to security risks, high dynamics of change). Instead, the spontaneous, chaotic diversification of digital communication channels that has taken place in most domestic schools has given rise to new destructive phenomena. The unsystematic use of disparate messengers (Viber, WhatsApp), social networks, and personal email accounts to solve professional tasks has led to:

– information asymmetry and dispersion of communication flows;

– the emergence of persistent «communication noise» that distorts management orders;

– a total blurring of the boundaries between the professional and private spaces of employees, functioning in a «round-the-clock» mode;

– massive digital burnout and psycho-emotional exhaustion of teaching staff.

The outlined contradictions actualize the need for purposeful scientific design of a single, orderly and ecological digital communication space of an educational

organization. An objective response to these challenges is the transition to a model of digital smart partnership (smart-partnership) – an open, parity, network interaction of all subjects of the educational process, which is based on the principles of collegiality, mutual respect, transparency and strict adherence to digital hygiene [17].

The practical implementation of such a model requires not only the implementation of modern cloud tools (Google Workspace ecosystem, Miro visual facilitation platforms), but also the formation of a fundamentally new organizational culture, the leading regulation of which is the Corporate Code of Digital Communication. Research into the technologies of such a transition on the basis of specific innovative educational institutions is of high theoretical and practical importance for the development of domestic science on educational management.

The transition to smart partnership is not just a replacement of paper forms for Google Forms, it is a change in the philosophy of interaction, where the leader acts not as a dictator, but as an architect and mediator of an ecological digital environment of joint activity.

Conceptualization of modern architectonics of communicative management in secondary education institutions requires a retrospective analysis of the change in management paradigms, since the genesis of organizational communications directly reflects the transformation of general scientific ideas about the essence, functions, principles and architecture of social management. During the 20th – early 21st centuries, classical approaches to understanding the essence of institutional interaction have undergone a complex and deep evolutionary trajectory, which was due to a systemic change in global technological systems, the transformation of social relations and a fundamental rethinking of the socio-cultural orientations of humanity. Communication within the organization has gone from a linear tool for transmitting commands to a complex, multi-level socio-synergetic phenomenon that determines the viability of a modern institution.

In the era of industrial society, when the classical and bureaucratic schools of management were dominant in the scientific and practical environment, communication within organizations was considered exclusively through the prism of

a mechanistic, technocratic approach. In this linear-functional paradigm of an educational institution, a model of a rigid hierarchical structure was artificially imposed, where information flows had a pronounced monological, vertically directive character. The main instrument for implementing managerial will was an order, instruction, circular or order, which descended from top to bottom along a strictly regulated chain of command. The subject-object matrix of such interaction completely leveled the personal and professional subjectivity of the teacher, reducing his role to that of a zealous, uninitiative executor of clearly defined functions [8].

Feedback in the classical administration system had a predominantly fiscal-reporting, retrospective focus and served exclusively as a tool for strict external control and error detection, rather than a source for internal self-correction, reflection and development of the system. Information was perceived as a scarce resource, the concentration of which at the upper levels of the hierarchy emphasized the powerful status of the administrator. Such a model was characterized by high staticity, total formalization and operational rigidity, which in conditions of a stable, predictable external environment provided a certain linear predictability, but was completely helpless in the face of the challenges of any dynamic changes or non-standard socio-cultural situations [3].

With the change in post-industrial orientations and the emergence of the school of human relations and behavioral sciences, the vector of scientific research has radically shifted from studying the technocratic parameters of the functioning of the «cog person» to the socio-psychological contour of the organization. Communicative management began to be interpreted not as a dry translation of codes, but as a multilevel process of interpersonal and intergroup interaction, where the effectiveness of the institution's activities directly correlates with the psycho-emotional climate in the team, the level of job satisfaction, the feeling of involvement in a common cause and the quality of horizontal ties. The conceptualization of communication as a complex process of exchanging meanings, values and emotional states, and not just sending coded information signals, laid the foundation for a radical rethinking of the role of the head of an educational institution. From an uncompromising, authoritarian

administrator, he was to transform into a leader-facilitator, coordinator and integrator, capable of harmonizing the personal goals, motives and aspirations of individual employees with the general mission and strategic objectives of the institution. During this period, an understanding of the importance of informal communication channels arises, which were previously considered destructive «rumors», and are now recognized as a flexible compensatory mechanism of the organizational structure [5].

At the end of the 20th century, the rapid spread of synergistic and systemic approaches allowed scientists to look at the institution of general secondary education as a complex, open, nonlinear socio-synergetic system, which is in a state of continuous energy-information, personnel and material exchange with the external environment. Within this methodological paradigm, adapted in detail to the specifics of educational systems in the fundamental works of G. Yelnikova, communicative management acquires the features of adaptive management. Information processes in a self-organizing system finally lose their rigid attachment to vertical axes and office regulations. They diversify, branch out and form complex network structures, where fluctuations (innovative ideas, creative breakthroughs, local initiatives of individual teachers or methodological associations) with proper management support are able to bring the organization out of a state of crisis or stagnation to a new, qualitatively higher level of order, stability and holistic development. Adaptive management in such a system is based on parity dialogue, decentralization of power, delegation of authority and continuous monitoring of system parameters through branched feedback loops [19].

In the continuum of the modern knowledge society, information explosion and total, widespread digitalization of society, a new management paradigm is objectively being formed – network, connectivist [12, 15].

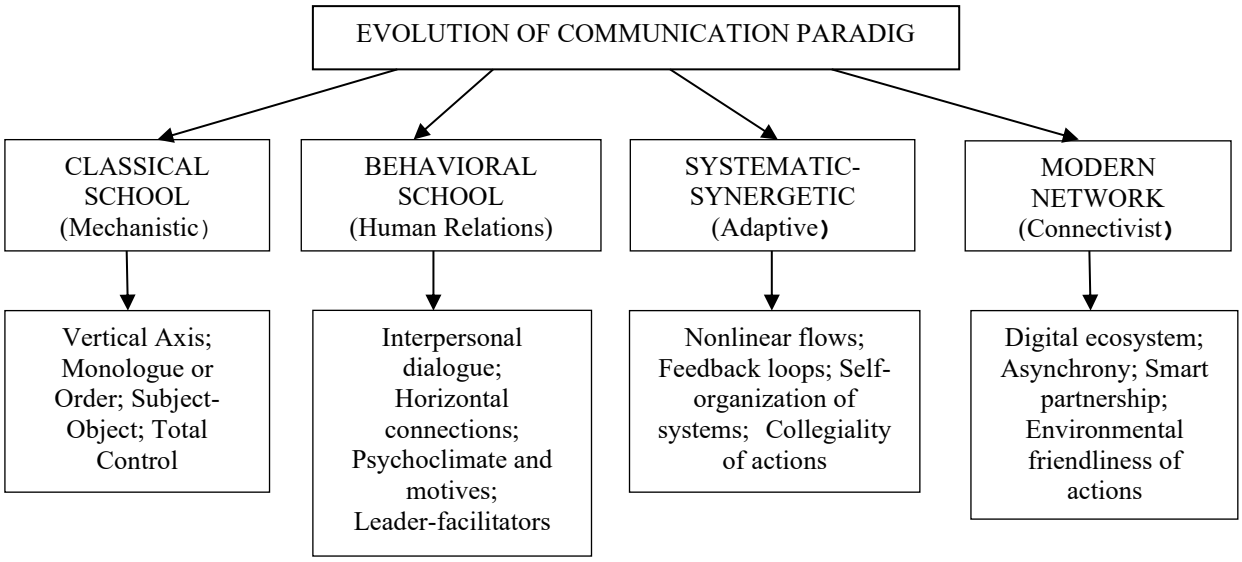

Figure 1 – Evolution of communicative paradigms

Information flows in a modern lyceum can no longer be physically and mentally limited by the framework of traditional paper document flow, scheduled meetings or the geographical boundaries of an educational institution. Communicative management today is transformed into the design of intelligent digital ecosystems, where the interaction between subjects is marked by a high degree of asynchrony, multimedia, hypertextuality and polysubjectivity. The information environment of the institution becomes dispersed and at the same time integrated. The main task of modern management is not total control over compliance with formal communicative regulations, but the professional creation of conditions for the emergence of emergent (newly discovered) synergistic effects through smart partnership tools. Technologies in such a model do not act as a burdensome superstructure that complicates the work of a teacher, but as a natural ecological environment for life, professional self-expression and development of the entire educational community.

Considering the evolution of communicative management paradigms, we can clearly trace how the role positions of key participants in the educational process and the instrumental content of management activities have changed. A comparative analysis of these paradigms allows us to understand more deeply the objective prerequisites for the transition to the latest management models.

Table 1 – The latest management models

Comparison parameters	Classical paradigm (mechanistic)	Social-psychological paradigm	System-synergistic paradigm	Network paradigm (smart partnership)
The nature of information flows	Strictly vertical, linear, unidirectional (top-down).	Combined (vertical-horizontal) with elements of informal ties	Nonlinear, branched, multi-vector, open	Dispersed, asynchronous, networked, cloud-integrated
The dominant form of interaction	Monologue, directive, order, job description	Dialogue, conversation, interview, collegial discussion, consulting	Polylogue, adaptive coordination, sociosynergistic interaction	Collaborative visual design, smart interaction, asynchronous polylogue
Position of the head of the institution	Administrator, fiscal, controller, bearer of absolute knowledge and power	Motivational leader, humanist, psychologist, coordinator of team efforts	Facilitator, strategist, adaptive manager, change initiator	Digital space architect, smart partner, eco-moderator
The role and status of the teacher	Object of control, cog in the system, unconditional executor of will	Subject of interpersonal relationships, a person with his own needs	Active subject of self-organization, bearer of managerial initiative	Autonomous smart partner, co-author of digital content and solutions
Feedback function	Control and fiscal, ascertaining deviations from standards	Diagnostic, identifying the level of satisfaction and stress	Regulatory, a tool for constant self-correction and adaptation	Transformational, the basis for generating new knowledge and smart solutions
Key tool or medium	Paper document, order book, official meeting	Production meeting, teachers' council meeting, personal conversation	Comprehensive monitoring, matrix structures, target groups	Cloud outline (Workspace), facilitation maps (Miro)

For a comprehensive disclosure of the essence, boundaries and heuristic potential of the subject of our research, there is an objective need for a deep theoretical and methodological analysis, deconstruction and definition of the basic denotation of «digital smart partnership». Within the framework of our scientific work, this category is positioned not simply as a modern technological metaphor, but as a leading, integral category of innovative educational management, which marks the transition of an organization to a higher degree of socio-cultural maturity. The etymology and scientific genesis of the concept of «smart partnership» go back to

Western theories of strategic alliance, concepts of network economy and models of knowledge management, where it was initially considered as a long-term, mutually beneficial, parity interaction between heterogeneous institutional actors (public sector, private business, academic institutions and public organizations) in order to achieve an additional synergistic effect through the integration of intellectual, financial and high-tech resources. However, with the purposeful extrapolation of this phenomenon into the specific plane of intra-lyceum management and its organic combination with the attribute «digital», this concept undergoes a deep substantive transformation, filled with qualitatively new pedagogical, managerial and axiological shades.

Within the framework of our study, by digital smart partnership in the management of an educational institution, we understand an intellectual-network, highly adaptive, ecological and value-oriented form of interaction between subjects of the educational process (administration, teachers, students, parent community), which is purposefully implemented in a single secure cloud environment on the principles of parity, mutual trust, transparency of information flows, clearly distributed responsibility and strict adherence to the individual psycho-emotional boundaries of each participant in the interaction for the purpose of joint design, monitoring and achievement of high quality educational activities.

The essential architecture and internal logic of digital smart partnership are revealed through an extensive system of basic descriptors and imperatives that allow it to be clearly differentiated from traditional, fragmented forms of electronic communication or spontaneous, chaotic digitalization of an educational institution:

– axiological descriptor (value-oriented). Smart partnership is fundamentally impossible without a radical transformation of the internal ethos and culture of the organization. It is based on a complete rejection of psychological dominance, manipulative techniques and administrative pressure, offering instead a stable culture of mutual trust, respect for the professional autonomy of the teacher and unconditional recognition of the subjectivity of each participant in the dialogue. Information ceases to be an instrument of power or intimidation; it is transformed

into a common good to which all partners have authorized, transparent and equal access. The value contour of smart partnership requires the formation of a new ethics of network behavior, where respect for the time and intellectual efforts of colleagues is a top priority;

– technological descriptor (intellectual-cloud). Unlike the spontaneous, unsystematic use of disparate digital tools, messengers or personal accounts, digital smart partnership is deployed exclusively in a clearly organized, homogeneous, corporately protected cloud circuit. Digital technologies in this model function not as mechanical means of communication or additional control superstructures, but as cognitive assistants. They are designed to automate routine data collection operations, visualize complex cause-and-effect relationships, ensure reliable preservation of the institution's institutional memory and create a barrier-free environment for joint work regardless of the physical location of the participants;

– praxeological descriptor (activity-adaptive). This aspect involves the broad, systematic use of tools for asynchronous interaction, joint distributed design and visual facilitation. Coordination of actions and monitoring of task performance are carried out here not through daily directive orders or exhausting physical meetings, but through open visualization of collective thinking, construction of mental maps, operational schemes and flexible matrices of joint responsibility.

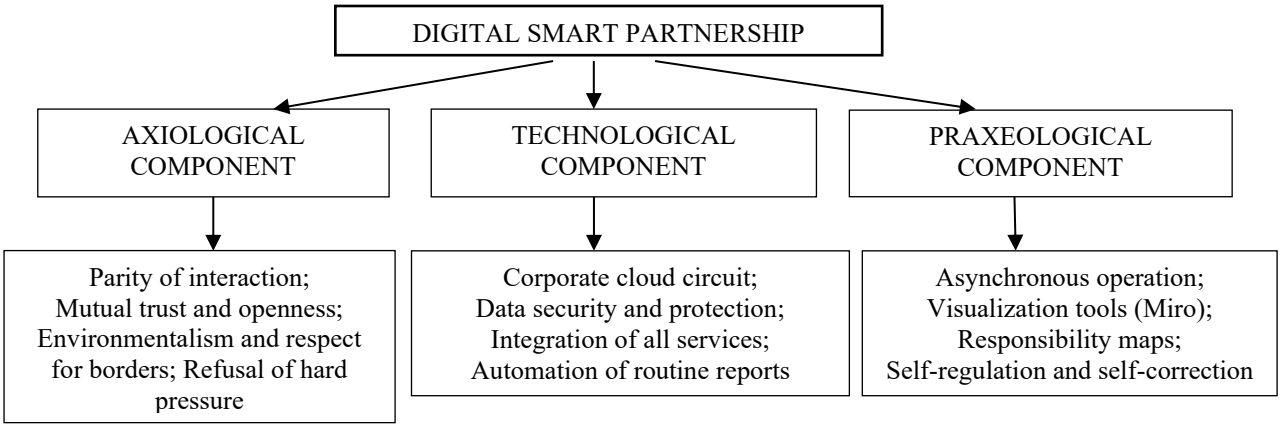

Figure 2 – Diagram of the digital smart partnership phenomenon

For a deep analysis of the phenomenon of digital smart partnership, it is necessary to structure its internal components, criteria for their manifestation and

specific indicators that will be measured during our experimental study. Such decomposition allows us to translate an abstract theoretical model into operational units of analysis:

– component: Axiological-ethical. Analysis criteria: The degree of humanization and ecologization of the organizational culture of the lyceum, the level of parity of interpersonal interaction. Indicators for measurement: The level of mutual trust between the administration and teachers; the degree of respect for the personal time boundaries of employees; the presence or absence of ethical conflicts in the digital environment; the degree of acceptance by the team of common corporate values;

– component: Organizational-management. Analysis criteria: Flexibility, transparency and adaptability of the existing communicative management system. Indicators for measurement: The speed of passage of management information from the source to the executor; the level of debureaucratization and refusal of duplication of reports; the degree of involvement of teachers in the processes of collective strategic decision-making; objectivity and openness of education quality monitoring procedures;

– component: Technological and competence. Analysis criteria: Level of homogeneity, security of the digital space and the degree of formation of ICT competence of subjects. Indicators for measurement: Level of consolidation of communication channels within a single platform; degree of teachers' mastery of cloud services tools and visual facilitation platforms; frequency of use of asynchronous means of interaction; level of protection of personal and institutional data from external threats;

– component: Praxeological and productive. Analysis criteria: Operational efficiency of communication, optimization of time costs and level of preservation of human capital. Indicators for measurement: Dynamics of time costs of administration and teachers for routine communication and approval of documents; level of reduction of symptoms of digital burnout of personnel; degree of productivity and

coherence of actions during team project work; quality of implementation of joint smart initiatives.

Thus, digital smart partnership appears in our study not as a random or purely technical set of tools, but as a complex, integral, multi-component socio-cultural system. It is designed to harmoniously combine the instrumental power of the latest cloud services with the humanistic, axiological guidelines of ecological organizational culture, acting as the only possible effective antidote against managerial chaos, chaos of connections and large-scale communicative destruction in the era of total information overload.

Design, scientific substantiation and practical implementation of innovative models of communicative management in a modern lyceum cannot be effectively carried out without a deep, comprehensive consideration of destructive psychosocial and organizational factors that are inevitably generated by a modern high-tech, but often anthropologically aggressive environment. One of the most acute, destructive and large-scale management problems, which significantly slows down the modernization of a modern school, blocks innovative processes and nullifies any creative or organizational efforts of management, is the phenomenon of digital burnout of pedagogical workers.

In classical scientific discourse, in particular in the fundamental works of L. Karamushka and representatives of her scientific school, professional burnout is traditionally analyzed as a complex syndrome of physical, emotional and mental exhaustion, which develops against the background of prolonged, chronic stress in the process of intensive, daily interpersonal interaction in the "person - person" system. However, in the conditions of forced, rapid and often psychologically unprepared transition of secondary education institutions to distance, mixed and hybrid formats of functioning, this syndrome has acquired fundamentally new, specific features. They are caused by the destructive, uncontrolled pressure of purely digital factors and tools.

Digital burnout of a teacher within the framework of our conceptual approach is considered as a multidimensional psychosomatic, intellectual and organizational-

activity state of personality destruction, which arises as a result of a long, uncontrolled and unregulated stay in the multi-channel information space, chronic information overload, constant techno-anxiety, a feeling of loss of control over time and a total blurring of the boundaries between the professional (work) and private (personal) spheres of life.

Among the leading, systemic organizational and managerial reasons that provoke the mass spread and deepening of symptoms of digital burnout in the teaching staff of modern Ukrainian lyceums, the following destructive factors should be identified and analyzed in detail:

1. The syndrome of «always on connection» (always-on culture or hyperconnectivity): The complete absence of clearly established, normatively regulated time limits and ethical restrictions for electronic communication leads to a situation where teachers receive text messages, requests, complex professional tasks and direct managerial orders from the administration, parent community or students late in the evening, on weekends, holidays or during official holidays. This creates in the teacher a stable, destructive state of constant psychological tension, anxious expectation of a new stressful stimulus and chronic inability to completely disconnect from work tasks, which makes it impossible to fully psycho-emotional and physiological recovery of the personality.

2. Multi-channel communication chaos and information noise: The use of a large number of unintegrated, dispersed messengers (Viber, WhatsApp, Facebook Messenger) to solve daily professional and managerial tasks, in parallel with official corporate mail, phone calls and paper media, produces a colossal level of communicative noise and chaos. The teacher is forced to continuously switch attention between different digital interfaces, which leads to rapid cognitive exhaustion, decreased concentration, an increase in the number of errors and a subconscious fear of missing or distorting vital managerial or educational information.

3. Technostress, ICT anxiety and digital divide: The uneven level of digital competence formation within the team in the absence of systematic, soft intra-lyceum

support, facilitation and mutual assistance causes a significant part of teachers (especially the older age group) a persistent feeling of their own professional inadequacy, chronic fear of using new software products and deep subconscious resistance to any digital innovations coming from the administration. Technology in this case is perceived not as an assistant, but as a hostile, punitive tool of control.

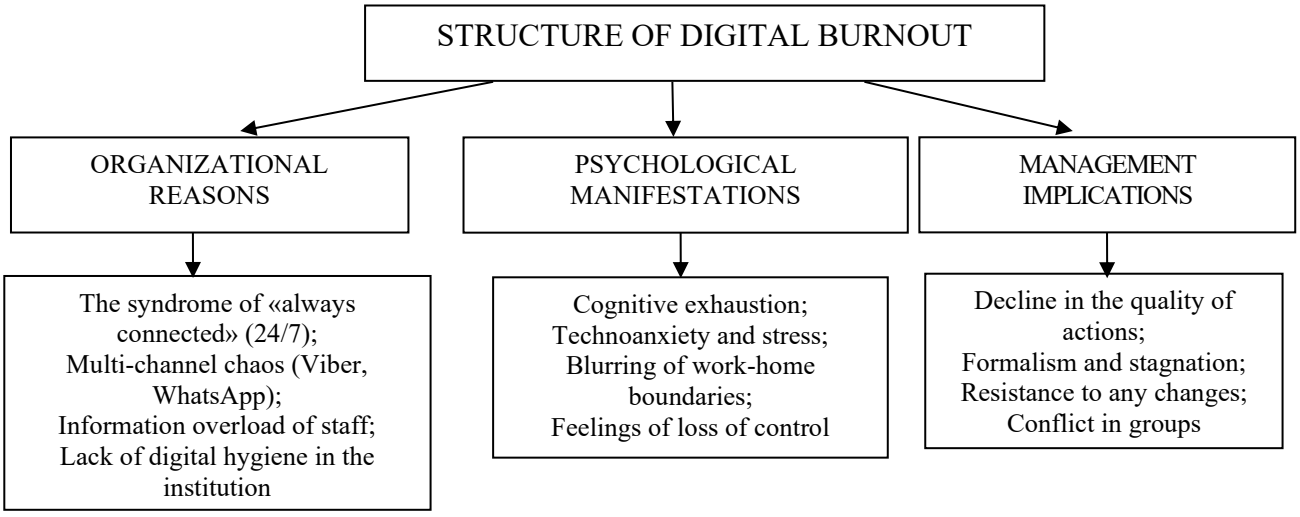

Figure 3 – Structure of digital burnout of the institution's staff

For the modern head of a secondary education institution, digital burnout of personnel quickly and inevitably moves from the category of purely personal, intimate psychological problems of an individual employee to the plane of deep managerial inefficiency and systemic crisis of the entire institution. A burned-out, cognitively overloaded teaching staff begins to demonstrate a sharp, catastrophic decline in the quality of the educational process, switches to a purely formal, indifferent performance of their duties, reveals a high level of hidden or open conflict in microgroups and offers fierce, destructive resistance to any modernization initiatives or innovative projects of the administration.

A change in the emotional background in the team leads to the destruction of organizational culture. The level of empathy in relationships with students and parents decreases, which provokes the emergence of new points of social tension around the educational institution.

Table 2 – Digital burnout of lyceum staff

Burnout stage	Psychological and somatic manifestations in a teacher	Behavioral markers in the digital environment	Necessary management steps for the manager
1. Mobilization and idealism	Increased activity, enthusiasm, neglect of sleep and rest for the sake of creating digital content	The teacher responds to messages instantly at any time of the day, creating many redundant chats	Soft activity restriction, digital hygiene reminders, no nighttime communication
2. Wall fatigue (exhaustion)	The appearance of chronic fatigue, irritability, the first manifestations of techno-anxiety, headaches	Delays in responses, irritated tone in comments, complaints about overload and large number of chats	Conducting an audit of communication channels, transferring some tasks to an asynchronous cloud format
3. Asthenic stage (resistance)	Emotional detachment, cynicism towards innovations, feelings of helplessness, decreased self-esteem	Ignoring messages in unofficial channels, formal unsubscribes, sabotage of filling out electronic forms	Implementation of protective provisions of the Corporate Code, clear fixation of communication hours, facilitation of processes
4. Complete burnout (deformation)	Deep psychosomatic depression, complete indifference to work results, professional deformation	Complete abandonment of the use of innovative tools (Miro, etc.), transition to minimally necessary communication	Providing psychological assistance, radical relief, a radical change in the person's communication structure

Therefore, the ecologization of the communicative space of the lyceum, the systematic protection of the individual temporal and psychological boundaries of the employee, debureaucratization and the implementation of strict local normative and value regulations (such as the Corporate Code of Digital Communication and the integrated cloud platform Google Workspace) appear in modern conditions not as a manifestation of abstract, groundless humanism, but as a direct, praxeological, professional duty of a modern educational manager. This duty is aimed at preserving, reproducing and capitalizing on the intellectual, creative and human potential of the entire organization. Above, we have carried out a comprehensive theoretical and methodological analysis of the essence, structure and evolution of communicative management in institutions of general secondary education in the conditions of total digitalization of the socio-cultural space. The results obtained allow us to formulate the following conclusions:

The evolutionary logic of management paradigms is substantiated: A retrospective analysis of scientific approaches has proven that organizational communication has undergone a complex transformation – from rigid vertical-directive, monological models of classical administration (where the teacher acted exclusively as an object of management) to socio-synergistic and connectivist (network) models of the knowledge society. It has been proven that in the conditions of modern social challenges and high uncertainty, traditional linear-hierarchical structures lose operational efficiency, which determines the objective necessity of transition to flexible adaptive management based on parity dialogue, decentralization and branched feedback loops.

The essence of the «digital smart partnership» is conceptualized: Based on the integration of theories of strategic management and informatization of education (V. Bykov, G. El'nikova, N. Morse), the denotation of «digital smart partnership» (smart-partnership) in lyceum management is defined. It is determined that this is an intellectual-network, highly adaptive form of interaction of all subjects of the educational process, which is deployed in a single secure cloud circuit. Its key components are identified and detailed:

– axiological-ethical (mutual trust, rejection of pressure, parity);

– technological-competence (homogeneity of the Google Workspace cloud environment, data security);

– praxeological-activity (asynchrony of interaction, joint design using Miro visual facilitation tools).

Digital burnout has been identified as a systemic management problem: The socio-psychological contour of organizational communication has been studied and it has been proven that the spontaneous, chaotic digitalization of an educational institution generates specific destructions: technostress, information overload, and the destruction of the boundaries between the professional and private lives of a teacher («always in touch» syndrome). It has been substantiated that the spread of burnout symptoms in a team leads to a decline in the quality of the educational process, hidden sabotage, and persistent resistance to innovations, which transfers this

problem from the category of individual psychological states to the plane of direct managerial inefficiency, which requires immediate organizational intervention [3].

Vectors for overcoming communicative destructions have been identified: It has been theoretically proven that an effective antidote to multi-channel chaos of communication and cognitive exhaustion of personnel is the greening of the information space of the institution. This involves the consolidation of all communication channels within a single platform and the normative and value-based regulation of interaction using local regulations (Corporate Code of Digital Communication). The protection of individual temporal and psychological boundaries of the employee is defined as the praxeological duty of a modern educational manager, aimed at preserving and reproducing the human capital of the organization.

The transition from theoretical and methodological modeling to direct design and empirical deployment of the digital smart partnership model requires a thorough organizational and managerial audit of the current state of the communication space of a specific educational institution. The object of practically-oriented research is a general secondary education institution. Conducting a comprehensive cross-section allowed us to identify the specifics of existing information flows, the level of techno-tension in the team and identify areas of communicative destruction that require urgent managerial intervention.

To obtain objective empirical data, an anonymous questionnaire, in-depth interviews and analysis of existing practices of document flow and intra-lyceum interaction were conducted, in which representatives of the administration, teaching staff and technical staff of the secondary education institution participated. The results of the diagnostics illustrate a key contradiction: despite the high general level of technical equipment of the institution, the logic of using digital tools for a long time remained within the outdated subject-object, directive paradigm. Let us consider the detailed results of the initial cross-section of the state of the information space of a general secondary education institution using analytical monitoring (Fig. 4).

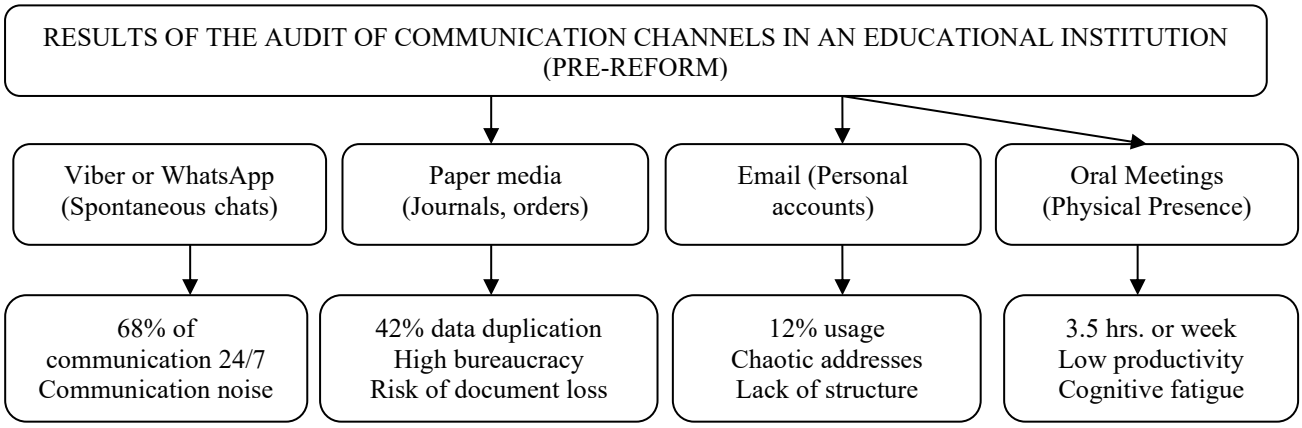

Figure 4 – The state of the information space of a general secondary education institution

The analysis of the collected data clearly indicated that the main source of stress for teachers is not the technologies themselves, but the lack of a culture of their use and clear organizational regulations. Based on the audit results, we formed a strategic matrix for reforming the communication space of a general secondary education institution. It involves the transition from spontaneous multi-channel to a single cloud ecosystem.

Table 3 – Analysis of collected data for reforming the communication space of a general secondary education institution

Communication environment diagnostic parameter	Current state in the institution (according to audit results)	Level of destructive impact on the team
Number of parallel digital channels	From 5 to 8 separate messengers and platforms are used (Viber, Telegram, personal emails, telephone communication)	High. Information dispersion, frequent loss of important management decisions and orders
Time limits for receiving messages	24/7. 74% of teachers indicated that they receive work messages after 8:00 PM and on weekends	Critical. Blurring the boundaries of private life, forming persistent technoanxiety and insomnia
Level of information duplication	Electronic reports are duplicated by paper journals or printed information in 42% of cases	High. Artificial overload of teachers with routine paper work, drop in motivation
Feedback effectiveness	Mostly fiscal (performance report). Collegial discussion in digital is chaotic	Average. Teachers feel like executors, not full partners in decision-making

The systemic management response to the identified destruction and chaos of information flows was the design and deployment of a single corporate cloud circuit for a general secondary education institution based on the Google Workspace for Education platform. This allowed consolidating all types of institutional interaction within one protected digital space, completely eliminating the use of disparate personal messengers to resolve work issues.

The logistical and operational structure of the secondary education institution's cloud space was designed to ensure maximum transparency, speed, and at the same time, delicacy of communication:

1. Administrative deployment and domain branding. Stage 1: Technical launch.

Registration of a unique corporate domain of the Lyceum, creation of accounts for each teacher according to a single nomenclature standard (last name.initials@domain_lyceum). Complete exclusion of the use of private mailboxes (such as ukr.net, gmail.com) from the institution's workflow.

2. Differentiation and structuring of Google Drives. Stage 2: Storage organization. Creation of a system of Shared Drives according to the functional principle: «Administration», «Methodological Council», «Departments/Subject Committees», «Class Leader». Access to folders is strictly regulated by job responsibilities, which makes unauthorized access impossible, but ensures absolute transparency within working groups.

3. Transfer of operational communication to Google Chat and Meet. Stage 3: Consolidation of channels. Creation of thematic corporate spaces (Spaces) in Google Chat instead of chats in Viber: «General Announcements» (access for reading only by teachers), «Methodological work» (dialogue), «Operational planning» (coordination). For online meetings and teacher councils, only the Google Meet service is used, with mandatory automatic recording and saving in the cloud for those who are absent for good reasons.

4. Implementation of Google Calendar as a time management tool. Stage 4: Time synchronization. Integration of the School-wide corporate calendar. All meetings of teacher councils, meetings of methodological commissions, open lessons,

monitoring sections and deadlines for submitting reports are entered there in advance. The teacher sees his workload schedule in real time, which eliminates the effect of surprise and urgency in work.

Effective smart partnership requires not just communication channels, but tools that allow you to jointly create new meanings, design the development of the institution, and clearly see the area of your personal responsibility. In a general secondary education institution, the leading praxeological tool for interactive management and visual facilitation has become the online platform Miro.

The use of Miro interactive whiteboards allowed traditional, often unproductive physical meetings and meetings of pedagogical councils to be transformed into a dynamic, visual, asynchronous design format. Instead of long, monotonous reading of reports, the lyceum staff was able to work in a common visual field. The main tool for coordination in a pair or microgroup was the development of digital maps of joint activities:

– the model «My responsibility in a pair or creative group»: The Miro visual panel clearly demarcates activity zones, for example, during preparation for a school-wide event or development of a monitoring tool. Teachers use multi-colored digital stickers, communication lines, and tags to record: which tasks are performed jointly, where the boundary of each person's autonomous responsibility lies, and by what date an intermediate result is expected;

– task dispatching using Kanban technology: Flexible work zones are created on the board: «To Do» – «In Progress» – «Review/Monitoring» – «Done». The administration and teachers see the progress of each project (for example, preparing the lyceum for state certification or accreditation) without additional meetings and mutual tug-of-war, which significantly saves human and time resources.

Thanks to Miro, each teacher clearly sees his contribution to the overall development strategy of the lyceum, which radically changes the internal motivation of activity and transforms the teacher from a passive performer to an proactive smart partner.

The most important, closing element of the model we designed, which is designed to directly solve the problem of digital burnout of the staff in a general secondary education institution, is the development and implementation of the Corporate Code of Digital Communication. This is a local normative and value regulation that was discussed, adjusted and adopted at a meeting of the pedagogical council of the lyceum on the basis of full consensus.

The Code acts as a voluntary agreement between the administration and teachers on the rules of «digital hygiene», aimed at preserving the psycho-emotional health of the team and improving the culture of interaction.

Main provisions of the Corporate Code of Digital Communication of a general secondary education institution:

1. Time-Gate Rule: All official digital communication within the corporate spaces of a general secondary education institution is carried out strictly during working hours (from 08:00 to 18:00 on weekdays). Sending messages, requests or orders after 18:00, on weekends or holidays is strictly prohibited for all interaction subjects (including the director and deputies).

2. Right to disconnect: The teacher has a full, legally protected right not to respond to any digital messages, emails or calls during their non-working hours, during illness or vacation. No sanctions, reprimands or administrative penalties for exercising this right can be applied.

3. Urgency regulations: If a message is sent to Google Chat during working hours, the standard response or review time is up to 4 working hours (this eliminates the need to check the phone screen every minute during lessons or checking notebooks). For emergency, force majeure situations, only a direct phone call is used.

4. Taboo on emotional destruction and caps lock: In digital communication, it is prohibited to use an aggressive tone, accusations, discuss the personal qualities of colleagues. It is prohibited to write messages in capital letters (which in network etiquette is equated with shouting) and abuse exclamation marks.

The implementation of the Code has allowed to drastically reduce the level of background stress in the team. Teachers of the secondary education institution got rid

of the syndrome of anxious expectation («always-on»), regained control over their own free time and private space, which was directly reflected in the improvement of the psycho-emotional climate in the groups and the overall improvement of the quality of their professional activities.

To quantitatively assess and visually monitor the results of implementing the digital smart partnership model in a secondary education institution, we developed a mathematical model of the effectiveness of the communication space. This model is based on the ratio of time spent, the number of communication channels, and the subjective level of digital stress of teachers.

The internal greening of an educational institution will not be complete without extending the rules of «digital hygiene» to the external contour, in particular to the interaction of class teachers and subject teachers with parents of students. Parent chats in messengers are traditionally one of the most psychologically tense zones, where spontaneous communication often provokes conflicts, technostress and violation of the teacher's time boundaries. To regulate these processes, the provisions of the Corporate Code of the secondary education institution were integrated into the practice of external communication through the creation of special rules of interaction in the triangle «Teacher – Parents – Secondary Education Institution».

Before the reform, parent chats operated around the clock. Teachers received complaints, questions about grades or homework late in the evening, and sometimes at night. In addition, public disputes between parents often arose in general chat rooms, confidential student data was made public (for example, public discussion of low grades or the behavior of individual children), and the collection of any information was accompanied by hundreds of disparate messages, in which important announcements from the administration were lost.

The introduction of environmental standards made it possible to structure this interaction. Class teachers clearly outlined working time limits for communication and established rules for moderating chats. A strict taboo was introduced on publicly discussing the progress or problems of a particular child in general groups – any issues related to the individual progress of a student are now resolved exclusively

through private messages or electronic diaries. To collect information (for example, surveys on participation in activities or nutrition), teachers began to use built-in voting tools or Google Forms, which completely eliminated communicative noise.

Special attention was paid to the culture of text and responding to emotional outbursts. Emotional and manipulative messages in chats no longer become a reason for text disputes – the teacher translates such communication into a face-to-face format or the format of a calm telephone conversation during working hours. This allowed us to change the perception of the teacher, raise his professional status, and transform the parent community from a source of technostress into a constructive partner in the educational process. Below is a comparative table of destructive practices and ecological smart standards for inclusion in monuments and regulatory documents of a general secondary education institution (Table 4).

The transition to new standards of interaction requires a consistent and logically structured algorithm of actions of the management level, since the directive imposition of rules of etiquette and restrictions often causes natural resistance from the team [7]. The entire process of implementing the project in a general secondary education institution was divided into several interconnected stages, each of which aimed to involve teachers in the joint design of changes.

At the first stage, an initiative group was created, which included representatives of the administration, the leader of the trade union committee, a practical psychologist of the educational institution, heads of subject-specific methodological associations and representatives of young specialists. This composition allowed taking into account the interests and concerns of different categories of employees.

The initiative group carried out an initial analysis of the current situation and developed a starting draft of the Code, adapted to the material and technical capabilities of the general secondary education institution.

Table 4 – Destructive practices and ecological smart standards

Aspect of interaction in chat	Destructive practice (Code violation)	Environmental smart standard (Environmental communication)	Management and psychological effect
1	2	3	4
Respecting time limits	A father or mother writes to a teacher in a shared chat or in a personal message on Saturday at 10:45 PM: «Good evening! Why does my son get a 6 for independent work, he learned everything? Check again!» The teacher begins to make excuses or get nervous	At the beginning of the year, the teacher establishes rules in the chat description: working hours for communication are from 8:00 AM to 6:00 PM on weekdays. Having received an evening message, the teacher replies on Monday at 8:30 AM: «Good afternoon! I will review the work and argue the grade today during the break after the 3rd lesson»	Protection against burnout. The teacher regains control over personal time. Parents get used to the fact that the teacher is a professional with a clear work schedule, not a 24-hour support service
Disclosure of confidential data and grades	The class teacher writes in a general chat, where all 30 parents are: «Parents of Petrenko, Sydorenko and Kovalenko! Your children skipped physics again and got an A on the test! Urgently take measurements as much as possible!»	The teacher publishes only system information in the general chat, and describes grades and behavior exclusively in personal messages (or via an electronic diary): «Olena Nikolaevna, good afternoon. I am concerned about Maksym's absence from physics class. Please check to see if everything is in order»	Protection of the dignity of the child and parents. Public condemnation only causes aggression and defensive resistance. An individual approach builds trust and encourages parents to real cooperation
Organization of information collection (Poll)	The teacher writes: «Who will go on a museum excursion on Friday? Write in the comments!» As a result, the chat explodes with 30 messages: «We are going», «We don't know», «How much does it cost?», «Oh, can I tell you later?». Important information is lost	The teacher uses the built-in poll function (Poll) or Google Form: «Dear parents, we are planning an excursion. Please vote in the form below by Wednesday (6:00 PM) so that I understand the exact number of children»	Elimination of communicative noise. Parents do not receive dozens of unnecessary notifications, and the teacher sees ready-made, automatically calculated statistics without having to ask each person individually

Continuation of table 4

1	2	3	4
Responding to emotional outbursts and toxicity	In response to the mother's emotional claim in the chat: «How much can you save for those notebooks, why are you putting them in your pocket?!», the teacher enters into a text argument: «How shameless of you! I actually buy chalk with my own money! If you don't like it, study at another school!»	The teacher stops the conflict with one phrase: «Dear parents, I remind you that our chat was created exclusively for mutual respect and job announcements. We can safely continue discussing financial or organizational issues at the parent meeting on Tuesday or in a phone conversation»	Localization of the conflict. Text disputes in chats have the ability to grow like a snowball. Transferring communication to a face-to-face or phone format instantly reduces the degree of emotions
Announcement schedule (Text structure)	The teacher sends chaotic remarks throughout the day: 1. «Come tomorrow in embroidered shirts» 2. «Oh, I forgot, take colored paper too» 3. «And don't forget the money for lunches»	The teacher forms one summary message once a day (for example, at 16:00): «Important information for tomorrow (03.06): 1. Clothes: festive (embroidered shirts). 2. For art class: colored paper and scissors. 3. Organizational: please check the balance on the lunch cards»	Clarity and high quality of information perception. Parents see a structured plan, do not miss important details, and the level of forgetfulness of students decreases significantly

At the second stage, the draft document was submitted for open asynchronous public discussion in a cloud environment. The text was posted in Google Doc format on the Shared Drive of the secondary education institution with access for commenting. During the week, each teacher had the opportunity to study the provisions of the Code at a convenient time for him/her, make his/her suggestions, express reservations or suggest corrections. The institution's psychologist carried out a constant analysis of the comments to identify areas of greatest tension and potential resistance, which allowed adjusting the wording of the document before its official approval.

The third stage involved the direct holding of the Pedagogical Council dedicated to the implementation of the Code. The meeting was organized using interactive visual facilitation technology. Instead of traditional reports and reading the

text, teachers united in creative microgroups and worked with Miro boards. Each group worked on a separate communication aspect (for example, rules for working with parents or time-gate regulations), recording on digital stickers the factors that would help implement these rules, and organizational risks that may arise. This allowed the removal of psychological barriers, as teachers felt themselves to be direct authors and creators of the new rules of the game.

The fourth stage ended with the fixation of consensus, a final open vote and the legal consolidation of the adopted Code by making a corresponding entry in the Minutes of the Pedagogical Council meeting and issuing an order of the head of the institution to put the local act into effect. The closing fifth stage involved declaring the first month of work a «test adaptation period». During this time, no remarks were applied for accidental violations of the rules of digital hygiene (for example, sending a message after 6:00 PM), and members of the initiative group delicately reminded colleagues of the existing agreements. After the adaptation period was completed, repeated monitoring was conducted to assess the effectiveness of the new model [14].

The entire set of actions to reform and legitimize the digital space of the lyceum unfolded according to the following scheme:

Step 1: Work of the initiative group and preparation of the project: Duration: 1-2 weeks. Creation of a temporary working group (representatives of the administration, trade union, lyceum psychologist, young teachers and heads of methodological associations). Conducting an initial audit. Adapting the basic template of the Code to the real technical and organizational needs of the general secondary education institution.

Step 2: Asynchronous public discussion in the cloud: Duration: 5-7 days. The draft Code is uploaded to the Shared Google Drive in Google Doc format with open access for commenting by the entire team. Each teacher has the opportunity to familiarize themselves with the document at a convenient time, leave comments, suggest changes or mitigation of certain points directly in the text. The institution's psychologist analyzes the comments for hidden resistance or concerns of colleagues.

Step 3: Facilitation session at the Pedagogical Council meeting: Duration: 45-

60 minutes. Instead of the traditional reading of the Code, the meeting is held using the Miro interactive whiteboard. The team is divided into microgroups by department. Each group works on a specific section of the Code (for example, «Time locks», «Ethics of chats») and posts stickers on the board: «What will help us to do this», «What risks do we see». The moderator (director or deputy) removes contradictions in real time.

Step 4: Fixing consensus and voting: On the day of the Pedagogical Council meeting. Making final edits agreed upon during the facilitation session. Conducting an open vote of the team on the approval of the «Corporate Code of Digital Communication of the Lyceum». Entering the relevant decision into the Minutes of the Pedagogical Council meeting. Signing the order of the head of the institution «On the implementation of the decision of the Pedagogical Council...».

Step 5: Adaptation period and monitoring of compliance: Constantly (cut-off after 2 months). The first 30 days are declared «test» – for occasional violations (for example, an accidental message in the chat at 19:30), the administration does not make any comments, and colleagues delicately remind about the rules of the Code. After 2 months, the initiative group conducts a repeated anonymous survey (or uses the Efficiency Calculator) to assess the dynamics of stress reduction and record real changes in the communication culture of the team.

For quantitative assessment, visual monitoring and verification of the results of the implementation of the digital smart partnership model in a general secondary education institution, a special mathematical model for assessing the effectiveness of the institution's communication space was developed. This model is based on the integral coefficients of the ratio of time spent on coordination, the total number of communication channels used and the subjective level of digital stress and overload of the teaching staff.

The developed tool allows the administration of an educational institution to carry out regular express monitoring of the state of the information environment and timely detect signs of degradation of management processes or risks of mass professional burnout of teachers. Visual modeling demonstrates that a simple

consolidation of communication channels in combination with strict adherence to «evening time gateways» can free up a significant amount of a teacher's time resource, which was previously spent on overcoming communicative noise, and redirect it to directly improving the quality of the educational process and self-development.

We suggest using an interactive tool that allows you to visually simulate how the implementation of digital hygiene rules and the consolidation of channels affect the overall index of communicative efficiency and the preservation of human capital in an educational institution:

Table 5 – Burnout & Efficiency Calculator

Indicator	Current Level	Guidance & Insight
Communication Efficiency	43%	Ability to complete deep work without interruptions
Professional Burnout	95%	Risk of cognitive exhaustion and boundary blurring
System Status	High	High risk. Prioritize 'offline' windows and consolidate tools

The implementation of a digital smart partnership requires fundamentally new approaches to tracking joint activities. Traditional management usually relies on retrospective monitoring (analysis of reports for the past month or quarter). However, the specificity of smart interaction lies in its dynamism, therefore the monitoring methodology should be based on the principle of real-time monitoring and maximum automation of data collection [2].

Methodological principles of monitoring:

– Continuity principle: Data on transactions, communication and fulfillment of obligations are read continuously using integrated digital systems;

– Data-Driven principle: Exclusion of the human factor during the initial collection of information. Indicators are formed on the basis of logs (system logs) and digital traces in a common ecosystem;

– Shared Visibility principle: Each participant in a smart partnership has access to a single «dashboard» that eliminates information asymmetry.

Digital monitoring tools. To implement these principles, the architecture of a digital smart partnership should include three main technological levels of tools:

1. Data Capture and Integration Tools:

– API Integration (Application Programming Interface): Allows you to combine the internal IT systems of different partners (for example, a manufacturer's ERP system and a carrier's logistics platform) into a single loop without violating their confidentiality;

– IoT Sensors (Internet of Things): If the partnership concerns material production or logistics, IoT devices automatically transmit data on geolocation, temperature, or equipment status directly to the monitoring system.

2. Consolidation and Processing Tools:

– ESB (Enterprise Service Bus or enterprise structure): Provides routing and transformation of data flows between partners in a single standard;

– Cloud Data Warehouses: Shared secure repositories for accumulating the partnership's Big Data.

3. Data Visualization and Decision-Making Tools:

– BI Platforms (Business Intelligence): Tools like Power BI or Tableau that transform arrays of technical logs into understandable graphs, trends, and predictive models for partnership management.

The main goal of this toolkit is to create a Digital Twin of Partnership – a dynamic virtual model that reflects the current state of execution of joint agreements, financial flows, and resource use with an accuracy of seconds.

The architecture of the modern post-industrial economic space is undergoing permanent transformations under the influence of the intensification of digitalization processes. These trends determine the objective need to rethink classical management paradigms, in particular in the context of the organization and functioning of inter-firm cooperation [11]. The implementation of digital smart partnership as an advanced form of network integration of business entities requires fundamentally new theoretical and methodological approaches to building monitoring systems for their joint activities. Traditional approaches to management, which are usually based

on discrete, retrospective monitoring (ex-post analysis of reporting data for fixed calendar periods), demonstrate their complete institutional and operational failure in dynamic digital environments. The specificity of smart interaction lies in its high lability, nonlinearity and dependence on the density of information flows [9]. In view of this, the monitoring methodology should be based on the imperatives of continuity, predictability and automation, which are integrated into a single concept of real-time monitoring (Real-Time Monitoring).

Within the framework of academic discourse, the methodological basis for monitoring digital smart partnership processes is proposed to be structured through a system of fundamental principles that determine its architecture:

– the principle of permanent description (continuity): Information signals about transactions, communication acts and the status of mutual obligations are read and recorded autonomously using integrated digital systems, forming a continuous time series without discrete breaks;

– the principle of objectification of primary data (Data-Driven Approach): It assumes the total elimination of the subjective human factor at the stage of generation and primary fixation of information. Activity indicators are formed exclusively on the basis of logs (system logs) and authentic digital traces that subjects leave in the process of operating in a common ecosystem;

– the principle of parity information symmetry (Shared Visibility): Means the elimination of any manifestations of information asymmetry between counterparties by providing each participant of the smart partnership with authorized and operational access to a single analytical control panel (Dashboard). This lays the foundation for the formation of a high level of inter-organizational trust;

– the principle of predictability (predictive focus): Monitoring is transformed from a tool for fixing errors to a tool for proactive response, when, based on the analysis of current trends, the system signals potential deviations and risks before they actually manifest.

For the practical implementation of the specified methodological principles, the architecture of a digital smart partnership should contain a branched, multi-level

technological toolkit, distributed according to the functional levels of information flow processing.

The first level – the level of primary data extraction and fixation – provides direct collection of raw information on operational processes. The main tool here is descriptive API integration (Application Programming Interface), which allows you to connect architecturally heterogeneous (disparate) internal IT systems of different partners (for example, the ERP system of an industrial enterprise and the logistics platform of a distributor) into a single circuit. This achieves a compromise between transparency and confidentiality: the systems exchange only clearly regulated data packages, without revealing internal code or trade secrets that are not related to the partnership. In the field of material production and supply chain management, this level is enhanced by Internet of Things (IoT) sensors and radio frequency identification (RFID) tools, which automatically transmit the parameters of physical processes to the system [4].

The second level – the consolidation, routing and transformation level – is responsible for the aggregation of multi-format information flows. The center of this level is the Enterprise Service Bus (ESB – enterprise service bus), which performs the function of a universal translator and data manager, reducing information from different entities to a single analytical standard. The accumulation of these arrays is carried out in cloud data warehouses (Cloud Data Warehouses) and «data lakes» (Data Lakes), the architecture of which is designed to process large volumes of unstructured information (Big Data). The third level – the level of intelligent visualization and cognitive analysis – transforms aggregated arrays of technical logs into relevant management knowledge. This task is solved using modern BI (Business Intelligence) platforms, such as Power BI or Tableau. Thanks to the implementation of intelligent process analysis technologies (Process Mining), the monitoring toolkit allows not only to build static graphs, but also to reconstruct real interaction models, identify hidden delays in communications and carry out multivariate forecasting of the development of partnership relations.

The ultimate goal of the described methodological and technological toolkit is to form a digital twin of partnership. This is a dynamic virtual model of interorganizational interaction, which reproduces with an accuracy of seconds the current status of joint agreements, the architecture of financial flows, the level of loading of common resources and the degree of satisfaction of the interests of each participant in the ecosystem. The presence of such a twin transfers monitoring from the category of service functions to the category of strategic assets of smart partnership.

In the process of deploying and operating a digital smart partnership, the classic mechanisms for verifying results and controlling the activities of counterparties undergo a deep ontological and structural transformation. Traditional institutional forms of confirming results, which have historically been based on paper-based document flow, multi-stage approval procedures, physical signatures and seals, and the periodic involvement of external auditors, are completely irrelevant in the conditions of high-speed digital ecosystems. Modern management thinking requires a decisive transition to the concept of continuous, decentralized and fully automated verification, which is able to guarantee the authenticity, immutability and legal significance of any of the operational or financial results in the system of inter-firm interaction.

The problem of ensuring trust between business entities within network structures is one of the central ones in the theory of transaction costs and institutional economics [10]. Under classical conditions, the formation of trust is a long, capital-intensive and subjective process, relying on reputational tools, personal connections of top management and the threat of judicial sanctions in case of detection of opportunistic behavior [18]. In the digital ecosystem of smart partnership, the category of trust undergoes desocialization and deinstitutionalization, transforming into the plane of technologically driven trust (Tech-driven Trust), which functions within the framework of the Zero-Trust Architecture [1]. The basic postulate of this concept is that no action, transaction or reporting indicator of any of the partners can

be considered valid a priori until they have passed a systematic, multi-level and independent procedure of automated digital verification.

The fundamental architectural basis for deploying a verification system in smart partnerships is the synergistic combination of distributed ledger technology (blockchain) and smart contract algorithms (Smart Contracts) [13]. Thanks to cryptographic protection methods and decentralized consensus, any data on the achieved intermediate or final results recorded in the blockchain network acquire the property of absolute immutability. This completely eliminates the risks of retrospective distortion, falsification or unilateral adjustment of performance indicators by any of the alliance participants.

The verification procedure within the functioning of a digital smart partnership is systemic in nature and is structured according to three interconnected hierarchical levels:

1. Level of identification and authentication of subjects: This level constitutes the foundation of ecosystem security. It is implemented through the deployment of public key infrastructure (PKI), mass implementation of new generation qualified electronic signatures (QES) and decentralized identifiers (DID – Decentralized Identifiers). This achieves absolute personification and non-repudiation of any action, operation or information message generated in the system.

2. Level of validation of processes and technological regulations: At this stage, continuous monitoring of compliance of current joint business processes with previously approved algorithms and interaction standards is carried out. Verification is implemented by automatic cross-matching (comparison) of actual time and operational log files with reference process models [15]. Any deviations from the regulatory track are recorded instantly, which allows you to localize failures before they are scaled up.

3. The level of verification of results and KPIs (Key Performance Indicators): It is a higher form of control, which consists in assessing the compliance of the received output products (material goods, software code, analytical reports, marketing results) with the criteria of quality, volume and completeness that were

recorded in the partnership agreement. Thanks to the integration of data mining methods and cognitive algorithms of artificial intelligence, the verification system is able to carry out not only a formal check of the availability of the result, but also a deep substantive analysis of its quality, revealing latent anomalies, structural defects or hidden inconsistencies with target benchmarks [20].

A significant advantage of the desocialized verification system in smart partnerships is giving it the properties of institutional self-regulation. In classical models of inter-firm cooperation, the emergence of contradictions regarding the quality or volume of work performed inevitably triggers long, costly and conflict-provoking procedures for claim and lawsuit work. In a smart partnership, conflict situations are minimized due to the algorithmization of compromises. The system automatically applies a differentiated discount rate or activates penalties embedded in the code, ensuring a high rate of capital turnover and a minimal level of risk for all bona fide participants in the ecosystem.

A comprehensive assessment of the effectiveness of the functioning of a digital smart partnership is a complex scientific and practical task, the solution of which requires abandoning one-dimensional management models. Traditional economic analysis, focused exclusively on financial indicators, is methodologically limited, since it captures only direct, visible commercial consequences and completely ignores deep, latent institutional and technological effects [9]. In view of this, the evaluation system in smart partnerships should be based on a descriptive-conceptual approach that considers efficiency as an integral property formed at the intersection of organizational, technological, economic and social subsystems of interaction.

The conceptual descriptive model of efficiency assessment is structured according to four fundamental criterion blocks, each of which describes in detail a specific vector of digital convergence and inter-firm integration:

1. Technological criterion (Level of digital convergence and infrastructure compatibility). This block of criteria is basic, since it determines the physical and algorithmic ability of partners to function as a single, integral organism in the digital space. The main descriptors within this criterion are:

– degree of interface seamlessness (API convergence): Characterizes the level of maturity and depth of integration of information systems, ensuring the effect of «shared memory»;

– level of cyber resistance and architectural security: Describes the ability of the integrated digital environment to counteract complex cyber attacks and ensure the integrity of shared databases [1];

– flexibility and architectural scalability (Scalability): Determines the ability of the digital partnership platform to quickly integrate new participants without the need to stop operational activities.

2. Operational-process criterion (Level of transformation and optimization of business models). This criterion allows to assess qualitative changes in the architectonics and dynamics of execution of common end-to-end business processes [1]. Key descriptors include:

– compression of transactional and operational cycles (Time-to-Market, Lead Time): Describes a qualitative reduction in time intervals from the moment of initiation of an idea to the receipt of value by the end consumer;

– coefficient of algorithmic displacement of routine operations: Characterizes the degree of liberation of human resources from performing repetitive functions due to their transfer under the control of software algorithms;

– dynamic lability of the value chain: Describes the speed with which a smart partnership is able to instantly reconfigure its production or logistics routes in response to sharp macroeconomic shocks [4].

3. Organizational-management criterion (Level of institutionalization and capitalization of trust). Focuses on qualitative changes in corporate culture and mental models of management:

– symmetry and transparency of the information field: Describes the state of the absence of intentional concealment or distortion of information between partners (Single Source of Truth);

– level of self-regulation and reduction of conflict: Characterizes the ability of the system to independently, based on built-in digital algorithms, level out contradictions [6];

– level of cultural and digital convergence: Determines the degree of harmonization of internal values, ethics and speed of thinking in different organizations.

4. Strategic-ecological criterion (Level of generation of long-term value and sustainable development). Describes the higher-order effects that determine the long-term viability of the partnership and its impact on the global socio-ecological space:

– dematerialization and greening of processes index (Eco-Efficiency): Characterizes the qualitative effect obtained as a result of the total transition to paperless technologies and optimization of spatial routes;

– co-creation of Value: Describes the ability of a smart partnership to function as an innovation incubator that produces unique digital products and business models [9].

The formation of such an extensive descriptive system of criteria allows us to transfer the process of assessing effectiveness from the position of a conservative accounting approach to the position of a strategic navigator. High scores on qualitative descriptors of technological and organizational compatibility act as a reliable leading indicator that guarantees the long-term market sustainability of the alliance.

The essential and final objective function of the initiation, deployment and long-term functioning of a digital smart partnership is the stable production and capitalization of an integral synergistic effect. Within the framework of classical academic methodology, this phenomenon is considered through the fundamental prism of systems theory and the concept of systemic emergence. An objective descriptive assessment of the nature of this effect and the construction of flexible management contours based on it are prerequisites for continuous optimization of the development strategy of an integrated structure.

In the context of the deployment of the fourth industrial revolution, the nature of the synergistic effect is significantly transformed under the influence of digital factors, acquiring a multidimensional and differentiated character:

– organizational and operational synergy: It consists in the radical elimination of inter-firm functional duplications and optimization of joint operational cycles. Thanks to the implementation of a single digital architecture, partners are freed from the need to conduct repeated checks and mutual verification of documents;

– transactional digital synergy: It arises due to the total algorithmization of control processes and verification of results [6]. The transfer of the institution of trust into verified program code of smart contracts minimizes the risks of opportunistic behavior [18]. Economic resources that would otherwise be spent on lawyers under classical agreements are freed up and transformed into a joint investment fund;

– market-complementary and innovation synergy: Based on the principle of complementarity of unique core competencies (Core Competencies). Combining specific technological developments of one company with the large-scale logistics infrastructure of another allows for disruptive market innovations, reducing costs and diversifying the risks of innovation activities between participants [9].

The process of continuous optimization of the smart partnership development strategy should be organized as a permanent, cyclical and highly automated process based on a descriptive model of a closed feedback loop (Feedback Loop). Based on qualitative assessments and analytical signals received in real time from the digital monitoring and verification system, the strategic management mechanism constantly calibrates the partnership development trajectory through the sequential implementation of four key phases:

– Phase 1. System diagnostics and localization of deviations: Provides for constant scanning of the ecosystem to identify infrastructure gaps, areas of process slowdown or the emergence of information barriers;

– Phase 2. Dynamic redistribution of aggregate resources: Based on diagnostic data, decisions are made on the operational maneuvering of the partnership's financial, technological and information assets;

– Phase 3. Evolutionary and structural scaling: Provides for a flexible change in the configuration of the partnership itself by attracting new actors (startups, universities) to the ecosystem that have competencies that are scarce for the system;

– Phase 4. Strategic reconfiguration of algorithms: It consists in adapting the basic rules of the game, enshrined in the code of smart contracts and regulations of common platforms, which allows keeping the system in a state of dynamic equilibrium with the external environment.

Thus, within the concept of digital smart partnership, the assessment of the synergistic effect and optimization of the strategy are transformed into a vital cognitive mechanism of organizational self-organization. The partnership acquires the properties of a living adaptive system that is able to independently learn based on current data, flexibly eliminate its own shortcomings and constantly increase its synergistic potential.

As a result of the study of the theoretical and methodological principles of building control systems, it is substantiated that effective monitoring of processes in the digital smart partnership system requires a complete departure from the paradigm of retrospective analysis in favor of the concept of real time (Real-Time Monitoring). It is proven that the integration of multi-level technological tools (API, IoT, BI platforms) allows you to form a full-fledged «digital twin» of inter-organizational interaction, which ensures the continuity and predictability of primary data collection.

It is determined that the mechanisms for verifying results and ensuring trust within the functioning of modern digital ecosystems undergo a qualitative transformation, moving into the plane of technologically driven trust (Tech-driven Trust). It is established that the synergy of distributed ledger technology (blockchain) and smart contract algorithms forms a mathematically deterministic control system that eliminates the human factor, guarantees the absolute immutability of recorded performance indicators and ensures automatic self-regulation of the ecosystem.

A comprehensive descriptive-conceptual model for assessing the effectiveness of the implementation of digital smart partnership has been formed, which overcomes the limitations of classical financial-oriented analysis. The model integrates four

fundamental criterion blocks: technological (level of digital convergence), operational-process (degree of business model transformation), organizational-management (institutionalization of trust) and strategic-ecological (level of sustainable development), which allows for a multidimensional assessment of the qualitative parameters of inter-firm integration. It is proven that the ultimate objective function and criterion for the viability of a smart partnership is the constant generation and capitalization of an integral synergistic effect that arises due to the systemic emergence of the digital ecosystem. A descriptive model of development strategy optimization based on a continuous closed feedback loop (Feedback Loop) is substantiated, which transforms strategic management into a constant process of self-organization and evolutionary scaling of the ecosystem.

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4. Digital communicative culture as a factor for ensuring sustainable development and smart partnership in innovative educational management

The globalization challenges of the 21st century, intensified by the rapid deployment of the fourth industrial revolution (Industry 4.0), total digitalization and systemic socio-cultural transformations, require a radical rethinking of the fundamental principles of management science in the educational sphere. The modern knowledge society is characterized by a high level of dynamism, information overload and permanent variability of the external environment. Under such conditions, classical, linear-bureaucratic management models, which for decades have relied on a rigid vertical hierarchy, strict administrative control and standardized regulatory regulation, are finally losing their operational and strategic effectiveness. They turn out to be too rigid, unwieldy and unable to adequately respond to crisis phenomena and challenges of the present. In the modern architectonics of social development, an educational institution can no longer function as a closed, isolated institution. Instead, it should transform into a flexible, open, adaptive ecosystem that has a high level of internal plasticity, capable not only of promptly responding to external fluctuations, but also of outpacing them through the generation, transfer and implementation of systemic innovations. In this context, communication becomes the central axis of innovation management. It ceases to be simply a utilitarian tool for transmitting management directives or a purely information channel. Communication acquires the status of a key strategic resource, intellectual capital and system-forming factor that determines the ability of an educational institution to long-term sustainable development and the development of a parity smart partnership.

The relevance of the study is enhanced by the urgent need to resolve the contradiction between the objective process of saturation of the educational space with the latest digital tools and the subjective unpreparedness of traditional management structures for their ecological and rational integration. Chaotic implementation of technologies without proper socio-cultural and ethical support

often leads to the destruction of the information space, professional burnout of pedagogical personnel and a decrease in the quality of educational services. Therefore, the theoretical and methodological justification and practical design of digital communicative culture as a conceptual basis for the development of smart partnership is one of the urgent tasks of modern theory and practice of educational management.

Within the framework of the modern scientific discussion devoted to the transformation of complex social and educational systems in the conditions of globalization turbulence, a deep rethinking of the ontological and praxeological nature of the interaction of management subjects acquires a special heuristic value. Historical and evolutionary analysis of management paradigms shows that classical models of institutional partnership, which were formed in the era of industrial society, were based mainly on formalized, linear-contractual, fiscal-reporting or purely hierarchical relations. In such systems, the interaction between institutions and stakeholders was mainly reactive and was reduced to the implementation of directives issued from above or the signing of framework agreements, which often remained purely declarative. In the continuum of the postmodern information society, where the key resource is the speed of knowledge processing and the flexibility of capital, such patterns reveal significant limitations, sluggishness and institutional helplessness. Rigid interaction algorithms are not suitable for multi-vector, nonlinear processes occurring in the modern labor market and educational environment. Instead, the objective imperative of innovative progress is the conceptualization, justification, and step-by-step practical implementation of smart-partnership models as a flexible, highly adaptive variety of a new type of intellectual-network interaction.

In modern scientific discourse, «smart partnership» in education is conceptualized as a higher, integrative and synergistic form of interaction between subjects of educational, scientific, industrial and socio-cultural spaces, which is totally mediated by the latest digital technologies and is based on the principles of cognitive openness, joint risk sharing, mutually beneficial generation of a unique innovative product and parity of communicative discourse. Unlike classical patterns

of cooperation or conventional social partnership, smart partnership focuses on forward development, flexible self-organization and the creation of intellectual ecosystems, where interaction brings an additional effect (added intellectual value) to all participants, which cannot be obtained autonomously. This involves a transition from a simple exchange of resources to the creation of a common intellectual field, where rigid inter-institutional boundaries are blurred, and joint design of the future comes to the fore.

The study of this complex deliberative and network architectonics in management is based on deep theoretical invariants of foreign scholars. First of all, this concerns the concept of self-learning organizations by P. Senge [10], which proves that the ability of an organization to learn faster than its competitors is the only sustainable source of its competitive advantage, and systems thinking is the main integrating discipline. The methodological basis is also the theories of the network society by M. Castells [5], which substantiates that in the information age, power and strategic influence are concentrated not in geographical or administrative centers, but in the network nodes themselves and the intersection points of information flows. Outside the network, a modern institution automatically finds itself on the periphery of social development.

This foreign experience is organically combined with the fundamental developments of domestic researchers in innovation management and adaptive management. In particular, the works of G. Yelnikova, who revealed the mechanisms of adaptive response of socio-pedagogical systems to environmental challenges through flexible goal-setting, diagnostic and prognostic support and delegation of authority, as well as L. Karamushka, who studied in detail the psychological aspects of managing innovative activities in education, the readiness of personnel to perceive organizational changes, psychological barriers and the leveling of destructive conflicts during the modernization of traditional management structures, are of exceptional importance here. The combination of resources, competencies, technological platforms and creative potentials of various entities within the

framework of smart partnership unfolds along two interconnected, complementary vectors – internal and external.

The intra-institutional vector involves a deep deconstruction of autocratic and rigidly vertical principles of administration in favor of participatory (participatory) management. The principles of such an approach in the context of dynamic organizational changes and overcoming internal resistance of personnel are substantiated in detail in the works of the well-known specialist in crisis management and organizational leadership J. Kotter [6], who identifies the stages of creating an atmosphere of urgency for change and forming powerful coalitions of support for innovation. Communicative discourse within such a model is radically transformed from monological (top-down directive) to dialogical and polylogical, where each participant in the educational process appears as an authentic, autonomous and responsible subject of change design.

The management culture, mediated by the principles of smart partnership, is based on a solid axiological foundation of mutual respect, correctness, collegiality and joint responsibility for the final result. This allows to level the risks of internal communicative destructions, overcome information asymmetry (when the administration owns the data, and teachers are isolated from the decision-making process) and optimize the processes of continuous monitoring of the quality of the institution's functioning. A vivid example of internal smart partnership in a secondary education institution is the joint design of the educational environment through digital platforms, where student self-government, parent committee and teaching staff act as equal co-authors of local innovative projects (for example, within the framework of the implementation of school participatory budgeting and the development of internal communication regulations).

The external vector reflects the institutional openness of the institution and its ability to diversify integration into the global and regional socio-economic space through the construction of sustainable relationships with a wide range of stakeholders. The educational institution ceases to be a simple consumer of budget allocations and turns into an active player in regional development. The practical

model of such a partnership is clearly implanted in the interaction of a general secondary education institution with the territorial community. This relationship goes far beyond the purely formal administrative subordination of the Department of Education and unfolds in the plane of intersectoral synergy. An example here is the participation of a general secondary education institution in digital and environmental initiatives of the community, partnership with local IT clusters to create digital literacy hubs, as well as hackathons, workshops and foresight sessions. Such a smart partnership appears as a joint creation of value-meaning platforms for knowledge transfer and adaptation of the lyceum's operational processes to the dynamic demands of the municipal and globalized market, which echoes the foreign concepts of the «knowledge society» of D. Scott [9], where education is considered as a driver of the creative economy.

Ensuring sustainable development of an educational institution directly correlates with the effectiveness of the functioning of the specified partnership networks. In the context of modern educational management, «sustainable development of an educational institution» is defined as a process of continuous, balanced and purposeful transformation of an institution, which ensures its high dynamic viability (adaptability, competitiveness, personnel and innovation potential) in conditions of chronic turbulence of the external environment without losing its basic identity and socio-cultural mission. The issue of sustainable development of educational systems and state-public partnership is the subject of in-depth analysis by domestic scientists, in particular V. Bykov, who substantiates the principles of long-term open cooperation of the parties as a factor of socio-economic balance and preservation of human capital in crisis conditions. Sustainable development of an organization is determined not by its static stability (which in times of crisis inevitably leads to fragility and stagnation), but by the ability to maintain basic functions and modernize institutional existence, where smart partnership with the community acts as the main catalyst.

Ultimately, the viability of such complex interaction entirely depends on the level of formation of the institution's digital communicative space. In this regard,

there is a need for a detailed analysis of the phenomenon of «digital communicative culture», which in innovative management is defined as an integrative subsystem of the general management culture, encompassing a set of digital competencies, ethical and normative prescriptions, corporate standards of virtual dialogue and technological tools that ensure environmental friendliness, orderliness and efficiency of information flows in the ecosystem of an educational institution.

The study of the digital dimension of management culture is based on the modern European framework of digital competencies and the concept of media culture by K. Welk, which allows transforming virtual interaction from a chaotic array of messages into a structured, reflective and transparent environment of joint activity.

For a holistic perception of the architectonics of the phenomenon under study, we developed a structural-logical model that visualizes the mutual determination of key components of the innovative development of an educational institution (Figure 1).

The graphic explication of the presented model proves that in the conditions of globalization turbulence, digital communicative culture acts as the primary infrastructural and mental basis (platform). It is it that transforms chaotic information flows into orderly channels of interaction. This, in turn, enables the parallel deployment of internal and external vectors of smart partnership. The internal vector ensures the transition to participatory management and the formation of joint responsibility within the general secondary education institution, and the external one integrates the institution into the general ecosystem of the territorial community and ties with stakeholders. The resulting vector of this system is the sustainable development of the institution, which is expressed through its high adaptability, innovative potential and dynamic viability.

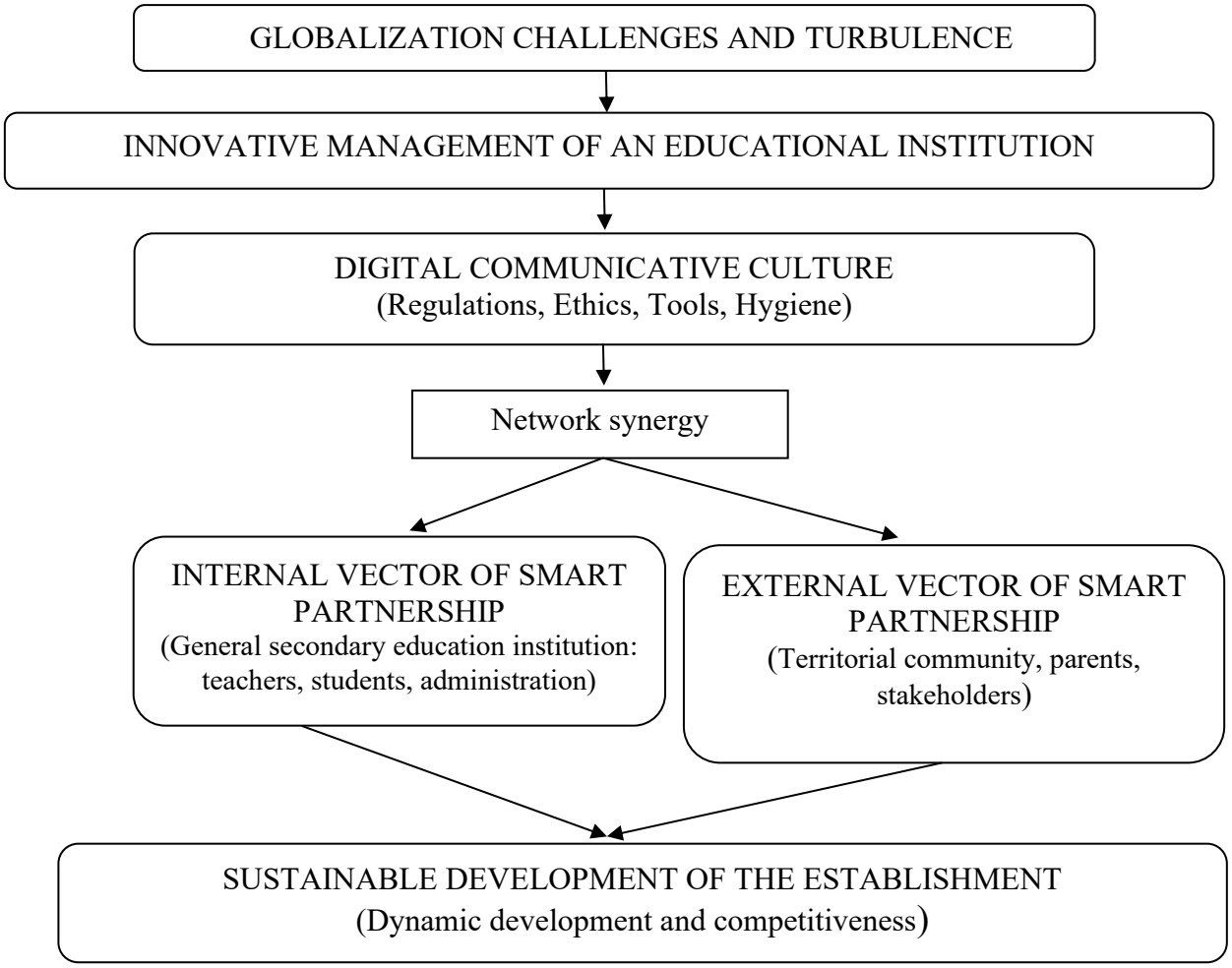

Figure 1 – Structural-logical model of smart partnership as a factor of sustainable development of an educational institution

In the socio-cultural space of the information society, traditional managerial architectonics are undergoing significant deconstruction under the influence of total digitalization. Under these conditions, the phenomenon of digital communicative culture of the head of an educational institution and the teaching staff moves from the plane of auxiliary technological skills (digital skills) to the status of a basic strategic resource and an invariant component of the general managerial culture. It reflects the qualitative state of the organization of information exchange, the depth of understanding of media processes and the ability of the leader to act as an architect of a digital environment that does not oppress the personality, but creates optimal conditions for its internal potential. An educational leader today is not just an administrator, but a mediator of cloud communications.

In the context of study, the «digital communicative culture of an educational organization» is defined as a holistic, dynamic subsystem of general management that integrates a set of digital tools, ethical and normative prescriptions, standards of virtual interaction and psycho-emotional attitudes that ensure environmental friendliness, orderliness and purposefulness of information flows in the innovative environment of the institution. The theoretical basis for the analysis of this phenomenon is laid in the fundamental concepts of «digital culture» by N. Negroponte [7], who brilliantly predicted the transition from the «world of atoms to the world of bits» and a change in the very anthropological foundations of communication, as well as in modern models of electronic leadership (e-leadership) by B. Avolio [4]. The authors argue that in the era of virtualization and hybrid work formats, the key quality of a manager is the ability to inspire, motivate, delegate, and coordinate distributed teams through digital channels without losing empathy, trust, and human capital.

The main destructive challenge for modern communicative management in education has become the spontaneous, chaotic diversification of communication channels. Empirical experience shows that the unsystematic use of disparate messengers (Viber, WhatsApp), social networks and personal email boxes to solve professional tasks leads to information asymmetry, dispersion of communicative flows, chronic overload of interaction subjects and, as a result, to the destruction of management algorithms. Such multi-channel chaos undermines the innovative potential of the organization, creates situations of loss or distortion of important orders, destroys executive discipline and generates the effect of «communicative noise». In addition, it completely eliminates the boundaries between the professional and private space of employees, functioning in the «24/7» mode, which inevitably produces the phenomena of mass digital burnout, psycho-emotional exhaustion and hidden communicative destructions in the team. A teacher who receives work assignments in a messenger at 10:00 PM loses creative motivation, which directly affects the quality of the educational process.

The solution to the outlined contradiction lies in the plane of purposeful scientific design of a single, orderly digital communication space of an educational organization. A rational transition from dispersed (dispersed) network communication to an institutionalized digital ecosystem involves the mandatory implementation of intra-corporate standards. The leading instrument of such regulation is the Corporate Code of Digital Communication - a local normative and value act that determines the architecture of virtual interaction through three fundamental dimensions:

1. Regulatory and technological dimension: provides for a clear differentiation and consolidation of specific digital channels by information types. Official documentation, reporting and planning are carried out exclusively in the Google Workspace ecosystem; project work and visual facilitation are carried out on Miro interactive whiteboards; and operational and emergency notifications are carried out in one approved corporate messenger. No working documents should be sent via personal social networks.

2. Ethical and axiological dimension: aimed at cultivating a high culture of network etiquette (netiquette), respect for academic integrity, tolerance and constructiveness during text discussions. This dimension regulates the inadmissibility of emotional outbursts in work chats, the use of caps lock (which is perceived as shouting), and also determines the rules for conducting online meetings (the requirement to have cameras turned on, compliance with the speech regulations, etc.), preventing manifestations of cyberbullying or mobbing.

3. Ecological-temporal dimension (digital hygiene): introduces a rigid fixation of time limits for professional communications (for example, a strict taboo on messages on work issues during non-working hours, weekends and holidays). The code also defines the legitimate time to wait for a response to a letter or message (for example, up to 4 hours for current issues), which relieves the employee of the stress of constant presence on the network and protects his right to rest and personal life.

For a detailed scientific decomposition of the mechanism of action of this tool, we modeled the structural-functional architecture of an ordered communication

environment of an educational institution (Figure 2).

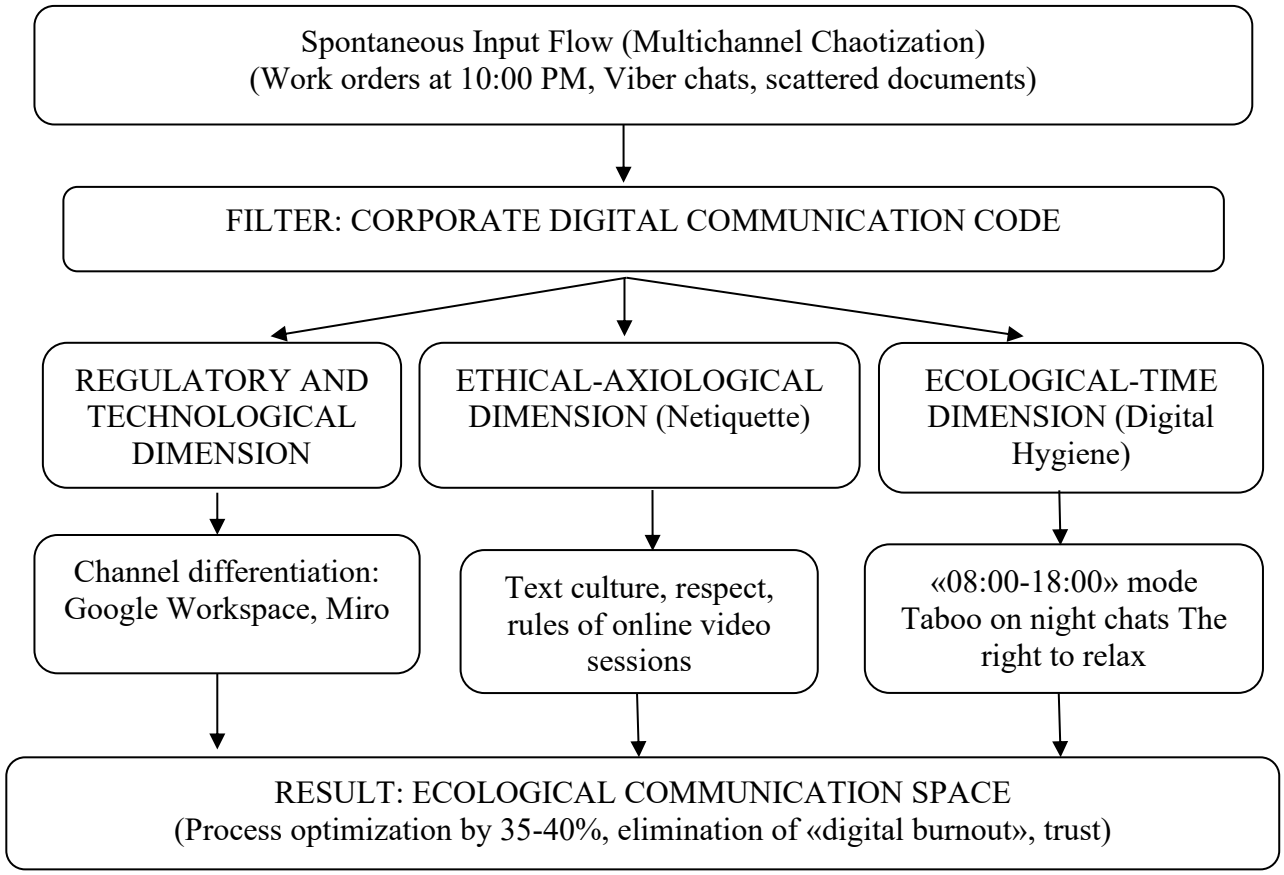

Figure 2 – Structural and functional model of optimization of the communication space of an educational institution

The graphic explication of the presented model (Figure 2) illustrates the technological and psychological-pedagogical effect of eliminating managerial chaos. The corporate code functions as a system filter-transformer.

Passing through its three dimensions, destructive and dispersed information flows acquire strict structure. The regulatory and technological block channels information into the appropriate services, the ethical and axiological block ensures psychological comfort and correctness of virtual dialogue, and the ecological and temporal block acts as a reliable barrier against professional burnout of personnel. Thus, the system results in a stable ecological communication space.

The effectiveness of the practical implementation of the Corporate Code of Digital Communication and the restructuring of the information space was verified on

the basis of a general secondary education institution. As part of internal monitoring of management quality, a comparative analysis of the effectiveness of communication processes before and after the introduction of the code and the transition to the Google Workspace platform was carried out.

An analytical review of the results presented in the table shows that a rationally organized digital communicative culture acts as a stabilizing, norm-setting and synergistic core of innovative management of an educational institution.

Table 2 – Comparative analysis of the effectiveness of communication management in a general secondary education institution

Comparison parameters	Traditional model (before the implementation of the code and ecosystem Google Workspace)	Innovative model (after implementation of the Digital Communication Code)	Management and innovation effect
Architectonics of communication channels	Multi-channel, dispersed (chaotic combination of several messengers, personal email, mobile calls)	Monochannel, ecosystem (clear distinction: Google Workspace – for documents, Miro – for projects, one messenger – for operational notifications)	Elimination of information duplication, centralization of management content, transparency of access
Communication ecology and digital hygiene	Diffuse (messages in work chats in the evenings and on weekends; no response waiting period)	Normalized (fixing the time limits of professional dialogue: from 8:00 to 18:00; taboo on resolving work issues during non-working hours)	Reducing the level of psycho-emotional stress of teachers (digital burnout), protecting the employee's private space
Decision-making speed and coordination	Low or medium (need for long offline meetings, long feedback collection via paper forms)	High (use of collaborative document editing tools, Google Forms express surveys, online whiteboards)	Reduction of time spent on administering routine processes by 35-40%; freeing up time for creative pedagogical activities
Educational process quality monitoring	Discrete (periodic collection of reports at the end of the semester, risks of subjectivity and information distortions)	Continuous (automated cloud-based scorecards, real-time digital analytics dashboards)	High predictability of management, the possibility of prompt adjustment of individual trajectories of education seekers

The experience of a general secondary education institution clearly demonstrates that the transition from the chaotic use of information technologies to a holistic digital ecosystem, regulated by local regulations, allows transforming the virtual space of the organization into a highly reflective, safe and productive environment. This is a direct infrastructural and mental imperative for deploying smart partnership models and ensuring the long-term sustainable development of an educational institution in response to today's globalization challenges. As part of internal monitoring of management quality, a comparative analysis of the effectiveness of communication processes was carried out before and after the introduction of the code and the transition to the Google Workspace platform. The results of this management modernization are summarized in Table 2. Thus, a rationally organized digital communicative culture acts as a stabilizing, norm-setting and synergistic core of innovative management of an educational institution. The experience of a general secondary education institution clearly proves that the transition from the chaotic use of information technologies to a holistic digital ecosystem, which is regulated by local regulations, allows transforming the virtual space of the organization into a highly reflective, safe and productive environment. This is a direct infrastructural and mental imperative for deploying smart partnership models and ensuring long-term sustainable development of an educational institution in response to today's globalization challenges.

The empirical projection of the theoretical model of smart partnership proves that its successful implementation is in direct deterministic dependence on the use of flexible digital platforms, which are capable of radically transforming the architecture of interaction between management entities. The spectrum of practical application of this paradigm is clearly traced in the activities of a general secondary education institution, which functions as a holistic innovative ecosystem integrated into the modern digital and socio-cultural space of the community. The process of deploying this model covers several interconnected technological and organizational levels. The transition to the smart partnership paradigm requires fundamentally new technological support for management decision-making. Monitoring the quality of

educational activities in a modern secondary education institution can no longer be based on periodic and subjective paper data collection. Instead, it is turning into a continuous, automated and high-tech process. For a deep scientific decomposition of this process, we have designed a holistic model of digital monitoring that integrates technological tools with specific management actions. The architecture and logic of the functioning of the developed monitoring tool are shown in detail in Figure 3.

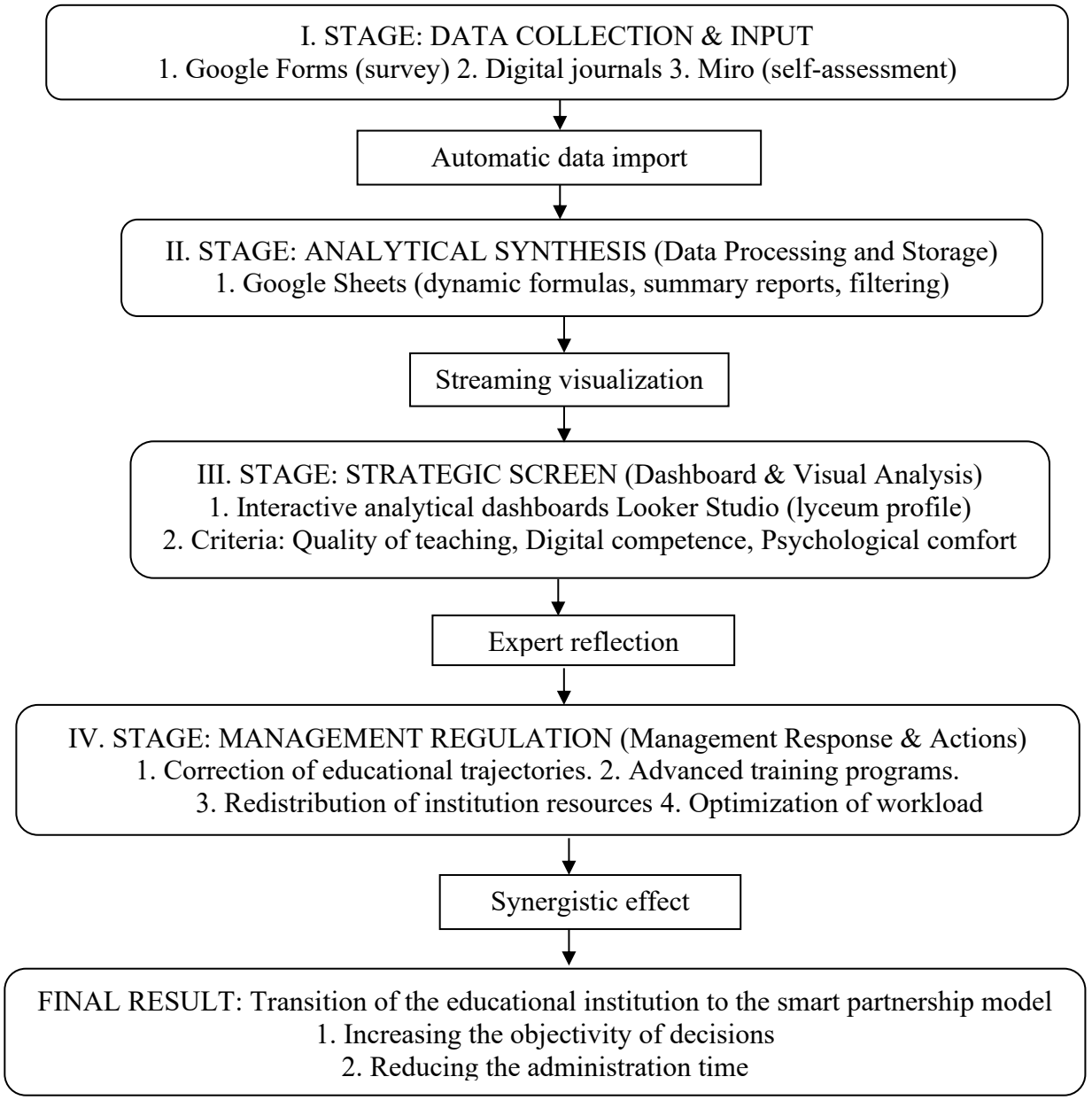

Figure 3 – Structural and functional model of digital monitoring of the quality of the educational process

Graphical explanation and logic of the model's functioning. The presented model (Figure 3) reflects the closed, cyclical nature of monitoring procedures and consists of four interconnected stages:

1. Primary data collection stage (I): serves as the foundation of the model. Thanks to the use of Google Workspace cloud tools (online surveys of parents, students, teachers via Google Forms; uploading statistical sections from digital journals) and interactive Miro maps (where teachers record their own areas of responsibility in pairs and groups during pedagogy), the information collection process is completely decentralized. This relieves the routine burden on the manager and makes data distortion impossible.

2. Analytical synthesis stage (II): provides primary grouping of information. The raw base is dynamic Google Sheets, where text and numerical responses are instantly converted into percentages and quality indices using customized mathematical formulas and pivot tables (Pivot Tables).

3. The strategic screen stage (III): converts digital arrays into visual indicators. Using the Looker Studio platform (formerly Google Data Studio) allows you to display the key performance indicators (KPIs) of the lyceum on an interactive dashboard for the administration. The head of the institution sees the dynamics along three critical vectors: the level of student academic achievement, the dynamics of the development of teachers' digital competence, and the index of psycho-emotional comfort of the environment (environmental friendliness of communication).

4. The stage of management regulation (IV): is the resulting block that closes the monitoring cycle. Based on the analysis of deviations from the norm on the dashboard, the lyceum director and his deputies make specific, well-founded decisions: from adjusting the schedule and directing teachers to specific advanced training courses to modernizing the Corporate Code of Digital Communication.

Practical testing of this model within the activities of a general secondary education institution has proven that the implementation of such an automated analytical cycle allows for the complete elimination of «blind management». Thanks to the transition to Looker Studio dashboards, the time for preparing analytical orders

based on the results of semester or annual assessments was reduced by 45%, and the objectivity and predictability of the administration's management decisions allowed minimizing institutional risks and ensuring the stable development of the institution even in today's crisis conditions.

Visual facilitation technologies in internal management. A striking example of the deployment of the internal vector of smart partnership in a secondary education institution was the complete departure from directive, vertical-linear planning in favor of collective, networked design of the development of an educational institution. The basic tool for this was visual facilitation technologies based on interactive online collaboration platforms (in particular, Miro interactive whiteboards).

Within the framework of this innovative model, traditional pedagogical councils, which previously took place according to the classic scenario of monologue reports and passive listening, have been transformed into open, dynamic sessions of strategic modeling. During such sessions, the administration and the teaching staff of the lyceum jointly develop complex management projects. Each participant, having personal access to a shared virtual space, can make suggestions, add comments, group ideas using visual stickers and vote for priority areas of development in real time.

A special place in this process is occupied by the development and implementation of dynamic models of the distribution of responsibilities, such as interactive interaction maps «My responsibility in a pair». These digital tools allow:

– to visualize complex, multi-stage innovative tasks, breaking them down into specific micro-steps;

– to clearly establish the zones of individual and joint responsibility of teachers working within the framework of one project or interdisciplinary program;

– completely avoid duplication of functions, uncertainty of tasks and hidden organizational conflicts;

– overcome psychological barriers of hierarchy between young specialists and experienced teachers, creating space for open creative search.

This approach ensures authentic parity of communication: any initiative of a teacher is not lost in bureaucratic labyrinths, but is recorded in a common digital field. The decision-making process is transformed into a transparent, reflective and participatory procedure, which significantly increases the internal motivation of staff and loyalty to innovative changes.

Cloud services as a tool for monitoring the quality of education. Another fundamental example of smart interaction in a secondary education institution is the development of systems for comprehensive monitoring of the quality of the educational process and administration based on the cloud services of the Google Workspace ecosystem for education. The creation of a single digital contour of the institution allowed to transfer routine information flows to an automated mode, minimizing time spent on paper work.

Within the framework of this system, a network of interconnected cloud repositories and analytical tables was developed and implemented, which collect and process large data sets in the following areas:

– current and final academic performance of students by class, subject, and individual trajectories;

– effectiveness of internal quality assurance of education (surveys, knowledge sections, monitoring of achievements);

– psychological and pedagogical indicators of the environment (level of adaptation, psycho-emotional state of students, level of satisfaction with the educational process among parents).

The management of a general secondary education institution, acting not as classic controllers, but as modern analytical managers, has gained the opportunity to track the dynamics of key performance indicators (KPIs) of the education system in real time through integrated digital analytical dashboards. This allows you to instantly notice negative trends (for example, a decrease in performance in a certain subject or an increase in anxiety in parallel classes) and make proactive, scientifically based management decisions.

In turn, teachers, students and the parent community act not as passive objects of external control, but as active subjects and partners. Parents have secure access to analytical sections of their children's success and can quickly communicate with teachers and administration through digital forms of feedback. Such a transparent architecture of interaction completely eliminates the risks of subjectivity, bias or information distortions in assessment, creating an atmosphere of high mutual trust and partnership.

In the external dimension, the smart partnership paradigm finds its practical embodiment in the creation of broad cluster innovation networks that unite a general secondary education institution with leading external stakeholders of the municipal, regional and all-Ukrainian educational space. The institution's strategic partners are higher education institutions, academic research institutions, business entities (in particular, representatives of the regional IT cluster) and specialized public organizations.

The main goal of this intersectoral interaction is the joint design of a modern educational environment, the implementation of advanced elements of STEM education, the development of digital literacy and the implementation of programs of systematic academic support for gifted youth. Within the framework of such a partnership, a general secondary education institution acts not simply as a passive recipient of external resources or donor assistance, but as an equal subject and developer of innovative content.

The process of cluster interaction unfolds through specific praxeological forms:

1. Scientific and pedagogical synergy: teachers of the secondary education institution undergo regular internships, trainings and advanced training courses at partner universities; at the same time, leading scientists and university lecturers participate in reviewing and advising on research projects of student members of the Small Academy of Sciences.

2. Practice-oriented projects: together with IT companies, digital competence hubs are created on the basis of a general secondary education institution, where

students work on real cases in programming, robotics, and 3D modeling, undergoing early professional orientation.

3. Municipal integration: the lyceum acts as an active participant and experimental platform for the implementation of strategic initiatives of the Department of Education and the Center for Professional Development of Pedagogical Workers. Joint hackathons, foresight forecasting and seminars allow the successful experience of a general secondary education institution to be transferred to other educational institutions in the community.

Prompt and effective communication between all nodes of this large-scale partner network is supported by the use of shared cloud repositories, integrated corporate communication channels and regular meetings in hybrid formats. As a result, the secondary education institution successfully overcomes traditional institutional closure and conservatism. The institution is transformed into a powerful municipal educational hub that provides its graduates with the acquisition of relevant digital competencies, developed soft skills and leadership qualities, directly adapted to the tough demands of the modern globalized labor market and the challenges of the knowledge society.

Theoretical and methodological substantiation of the smart partnership paradigm in the context of the transformation of educational systems. As a result of the conducted research, it is substantiated that in the conditions of globalization turbulence, high socio-economic uncertainty and total digitalization of the knowledge society, traditional linear-bureaucratic models of management of educational institutions have finally lost their operational capacity. Rigid vertical hierarchy, formalized control and rigid administration algorithms are becoming the main destructive factor that inhibits innovative development and reduces the competitiveness of institutions. The objective imperative of modernization of the modern educational sphere is determined to be the transition to a flexible, adaptive paradigm of smart partnership.

Within the framework of the developed concept, smart partnership in education is defined as a higher, integrative and synergistic form of interaction between subjects

of educational, scientific, industrial and socio-cultural spaces, which is totally mediated by the latest digital technologies and is based on the principles of cognitive openness, parity of communicative discourse, mutually beneficial generation of a unique innovative product and joint risk sharing. It is proven that the sustainable development of a modern educational institution – its dynamic viability, ability to self-organize and preserve human capital in crisis conditions – is directly determined by the effectiveness of the parallel deployment of two vectors of interaction:

– intra-institutional, which involves the deconstruction of autocratic management in favor of participatory (participatory) management through the involvement of teachers, students and parents in the joint design of changes;

– external, which is implemented through the construction of open, intersectoral cluster networks with municipal authorities, academic institutions, etc.

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