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CONCEPTUAL AND TERMINOLOGICAL DELINEATION OF CLUSTERING AND ITS PLACE WITHIN MODERN APPROACHES TO ECONOMIC DEVELOPMENT

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КОНЦЕПТУАЛЬНО-ТЕРМІНОЛОГІЧНЕ ОКРЕСЛЕННЯ КЛАСТЕРИЗАЦІЇ ТА ЇЇ МІСЦЯ В СУЧАСНИХ ПІДХОДАХ ДО ЕКОНОМІЧНОГО РОЗВИТКУ

The article examines the conceptual and terminological foundations of clusterisation and substantiates its place among contemporary approaches to economic development. The starting premise is that the wide diffusion of cluster rhetoric in academic research and development policy has not been accompanied by sufficient terminological unity, which creates a risk of substituting the cluster logic with adjacent categories and instruments operating through different causal

mechanisms. In this study, a cluster is defined as a territorially embedded economic system of related activities in which specialisation, value creation linkages, competition and cooperation, and institutional embeddedness jointly generate reproducible productivity and innovation effects through proximity and coordinated collective action. The paper synthesises the evolution of cluster thinking from explanations centred on localisation advantages and proximity effects to a modern interpretation of clusters as structured fields of interconnected firms and associated institutions capable of sustaining upgrading trajectories and enhancing competitiveness.

Special attention is given to identifying the specific characteristics of clusterisation and distinguishing it from neighbouring paradigms and formats. Agglomeration-based approaches attribute performance primarily to density and general urbanisation economies without requiring field-specific relatedness and value-chain interdependencies; infrastructure-based territorial development instruments provide location conditions or incentives without ensuring reproducible interaction effects; and broad innovation and institutional frameworks coordinate knowledge and actors at a higher level of abstraction without necessarily specifying the boundaries of specialisation and the economic structure of related activities within a particular territory. The study outlines the methodological implications of terminological ambiguity for the comparability of empirical results, measurement validity, and the rationale of support instruments.

Thus, the practical significance of the obtained findings lies in the fact that they enable correct operationalisation of clusterisation in analysis and development policy, reduce the risk of substituting it with infrastructure-based or purely strategic categories, and support evidence-based differentiation between clusters, cluster initiatives, and co-location formats lacking durable interdependencies.

У статті досліджено концептуально-термінологічні засади кластеризації та обґрунтовано її місце серед сучасних підходів до

економічного розвитку. Вихідним положенням є те, що широке поширення кластерної риторики в наукових працях і політиці розвитку не супроводжується достатньою термінологічною єдністю, унаслідок чого виникає ризик підміни кластерної логіки суміжними категоріями та інструментами, які діють через інші причинно-наслідкові механізми. У статті кластер розглянуто як територіально закріплену економічну систему пов'язаних видів діяльності, у межах якої спеціалізація, ланцюги створення вартості, конкуренція і кооперація та інституційна вбудованість спільно формують відтворювані ефекти продуктивності та інноваційності на основі близькості та узгоджених колективних дій. Узагальнено еволюцію уявлень про кластеризацію від пояснень локалізаційних переваг і ефектів близькості до сучасного трактування кластерів як структурованих полів взаємопов'язаних фірм та асоційованих інституцій, здатних підтримувати траєкторії оновлення і підвищення конкурентоспроможності.

Окрему увагу приділено виокремленню специфічних ознак кластеризації та її відмежуванню від «сусідніх» парадигм і форматів. Показано, що агломераційні підходи пояснюють результативність через щільність і загальні урбанізаційні ефекти без обов'язкової профільної пов'язаності та ланцюгових взаємозалежностей, інфраструктурні інструменти територіального розвитку забезпечують умови розміщення або стимули без гарантії відтворюваних ефектів взаємодії, а інноваційно-інституційні рамки задають ширший рівень координації знань і акторів, не завжди фіксуючи межі спеціалізації та економічну структуру пов'язаних діяльностей у конкретній території. Окреслено методологічні наслідки термінологічної невизначеності для порівнюваності емпіричних результатів, валідності вимірювання та обґрунтованості інструментів підтримки.

Таким чином, практичне значення отриманих положень полягає в тому, що вони забезпечують коректну операціоналізацію кластеризації в

аналітиці та політиці розвитку, знижують ризик її підміни інфраструктурними або суто стратегічними категоріями та уможливають доказове розмежування кластерів, кластерних ініціатив і форматів співрозміщення без стійких взаємозалежностей.

Keywords: *clusterisation; clusters; regional development; competitiveness; innovation; institutional interaction; value creation linkages.*

Ключові слова: *кластеризація; кластери; регіональний розвиток; конкурентоспроможність; інновації; інституційна взаємодія; ланцюги створення вартості.*

Introduction. In today's economy, which is characterised by rapid technological change, increasingly complex global value chains, and the growing importance of knowledge and intangible assets, a key practical challenge for countries and regions is to enhance competitiveness through innovation, productivity growth, and structural upgrading. In this context, clusterisation has become one of the most widely used approaches to organising economic development, as it combines market incentives with the advantages of spatial proximity and sustained cooperation between firms and institutions. In its classical interpretation, clusters are understood as geographically concentrated groups of interconnected companies and related institutions within a particular field, which strengthen competitive advantages through specialisation, complementarity, and dense linkages.

The practical relevance of clusterisation lies not merely in the concentration of production, but in its capacity to generate higher-quality economic effects. These include deeper specialisation among suppliers and service providers, improved access to skilled labour, faster diffusion of knowledge and technologies, lower transaction costs of interaction, and the development of collaborative innovation projects and shared infrastructure in research, education, testing, and engineering. For this reason, European Union policy conceptualises clusters as

groups of firms and associated economic actors and institutions located close to one another and reaching a scale sufficient to build specialised expertise, resources, suppliers, and skills, thereby enabling small and medium-sized enterprises to innovate and scale more effectively, including via internationalisation and intellectual property protection.

At the same time, the academic salience of clusterisation is reinforced by conceptual expansion and terminological overlap. Alongside clusters, research and policy increasingly employ notions such as networks, ecosystems, innovation districts, and agglomerations, often without clear boundaries between them. This produces methodological heterogeneity, as different studies apply divergent identification criteria ranging from proximity and sectoral relatedness to the intensity of interaction, governance structures, specialisation, and value chain integration, thereby limiting comparability of empirical findings and the robustness of the evidence base for support policies. A further applied risk is the formal labelling of territorial concentrations or ad hoc partnerships as clusters despite the absence of stable production and cooperation linkages, institutional coordination, and reproducible economic effects. In such cases, a cluster is treated as an organisational label rather than an economic system of interaction, which weakens outcome measurement, the selection of policy instruments, and the assessment of clusters' contribution to innovation-led structural transformation.

Therefore, the core problem concerns strengthening the conceptual clarity of clusterisation as a category of economic development and ensuring its rigorous use in analysis and policymaking. Accurate differentiation from related phenomena conditions indicator selection, the logic of public support, the institutional design of cluster initiatives, and the validity of conclusions about clusters' role in economic modernisation under digital and green transitions.

Literature Review. Analysis of recent research and publications. The theoretical foundations of spatial concentration of production and the external effects of localisation were developed in the works of A. Marshall [1], while the contemporary conceptual framing of clusters as a driver of competitiveness and

productivity is associated with M. Porter's approach [2; 3]. The advancement of analytical perspectives on agglomeration processes and the endogenous formation of "core" and "periphery" within the framework of the new economic geography is presented in the works of P. Krugman [4].

In the Ukrainian academic discourse, issues related to the essence of clusters and clusterisation, their key characteristics, institutional composition, and practical mechanisms for the formation and development of cluster entities have been addressed in the works of S. Sokolenko [9], M. Voinarenko [10], O. Tyshchenko [11], and M. Kyzym [12], as well as in research by Z. Liulchak and Kh. Vyshniavska [13], which considers clusterisation as an instrument for strengthening the competitiveness of enterprises and regions.

At the same time, despite the substantial body of scholarship, the literature has not achieved terminological unity regarding the relationship between the concepts of "cluster," "clusterisation," and related categories. Differences also persist in the criteria used to identify clusters, including spatial proximity, sectoral relatedness, the intensity of cooperation, the presence of coordination mechanisms, and the degree of integration into value-added chains.

Research Aim and Objectives. *The aim of this study is to provide a conceptual and terminological synthesis and substantiation of the notion of "clusterisation," to identify its defining features and principal distinctions from related phenomena, and to clarify its place within contemporary paradigms of economic development.*

To accomplish this aim, the study pursues *the following objectives:*

- to conduct a theoretical and methodological review of scholarly sources on cluster formation, with particular attention to the stages of clusterisation development;
- to analyse the factors influencing the formation and functioning of clusters in the national economy;
- to identify the specific characteristics of clusterisation within modern economic development paradigms;

– to monitor current trends in cluster development in the global and national economy.

A set of scientific methods was employed to ensure analytical coherence, including systems analysis, generalisation, the comparative-historical method, structural-functional analysis, and analytical methods, which enabled the formulation of scientifically grounded conclusions regarding the role of clusterisation in shaping the contemporary economic environment.

Main Discussion. The theoretical and methodological review of the literature indicates that the genesis of clusterization as a category of economic development has evolved through successive stages, moving from explanations of the effects of spatial concentration of production to interpretations of clusters as multi-level network-based systems of interaction among economic actors and institutions. The foundational premises are associated with the neoclassical tradition of analysing localisation externalities. In *Principles of Economics* (1920), A. Marshall [1] substantiated the mechanisms of external economies arising from the territorial concentration of specialised producers, including the formation of local labour markets, the emergence of specialised suppliers, and the accelerated circulation of knowledge within a localised milieu (Table 1).

A subsequent stage is linked to the conceptual shift from a narrow description of localised production towards an understanding of territorially concentrated production systems as socio-economic communities supported by local norms, trust, and the institutional embeddedness of actors. This line of reasoning was systematised in research on Italian industrial districts and inter-firm cooperation, consolidated by F. Pyke, G. Becattini, and W. Sengenberger in *Industrial Districts and Inter-Firm Co-operation in Italy* (1990) [14], where local production agglomerations are treated as coordinated systems rather than merely spatial groupings of firms. In the 1980s, the logic of network-based organisation of production and flexible specialisation, as an alternative to the Fordist model of mass production, was developed by M. Piore and C. Sabel in *The Second Industrial Divide: Possibilities for Prosperity* (1984) [15]. This shift reoriented the

analytical focus from firm-level scale to inter-firm cooperation, specialisation, and the adaptive capacity of local production systems.

Further methodological clarification concerns the distinction between passive agglomeration benefits and active cooperation. In “Collective Efficiency: Growth Path for Small-Scale Industry” (1995), H. Schmitz [16] introduced the concept of collective efficiency as the combined outcome of external economies and joint action by cluster participants. This approach is methodologically important because it moves cluster analysis beyond co-location towards the examination of coordination mechanisms and institutional conditions that enable sustained cluster performance.

The contemporary conceptual consolidation of clusters as a driver of competitiveness, productivity, and innovation is most closely associated with M. Porter’s framework. In *The Competitive Advantage of Nations* (1990), Porter [2] articulated the competitiveness logic through which clusters contribute to productivity and upgrading, while in “Clusters and the New Economics of Competition” (1998) he provided a mature conceptual statement of clusters as geographic concentrations of interconnected companies and associated institutions that enhance performance through complementarities, rivalry, and knowledge spillovers [3]. In parallel, the formal modelling of agglomeration processes and self-reinforcing spatial concentration was advanced by P. Krugman in “Increasing Returns and Economic Geography” (1991) [4], strengthening the methodological toolkit for analysing core-periphery dynamics and spatial inequality.

The institutional and policy dimension of clusterization has been codified in documents produced by supranational institutions, where the cluster approach is treated as an instrument of innovation policy and competitiveness enhancement. A prominent example is the European Commission (EC) communication “Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy” [5]. In addition, the Organisation for Economic Co-operation and Development (OECD) consolidated the cluster approach as a policy-relevant analytical framework in *Boosting Innovation: The Cluster Approach* (1999) [6].

Practical methodologies for the development of clusters and networks of small and medium-sized enterprises were systematised by the United Nations Industrial Development Organization (UNIDO) in *Development of clusters and networks of SMEs: The UNIDO programme (2001)* [8].

Empirical work aimed at quantifying the relationship between regional cluster composition and economic performance is represented, *inter alia*, by M. Delgado, M. Porter, and S. Stern in the National Bureau of Economic Research (NBER) working paper “Clusters, Convergence, and Economic Performance” (2012) [7]. At the implementation level, applied syntheses translated conceptual definitions into practical design choices for cluster initiatives: in *The Cluster Initiative Greenbook (2003)*, O. Sölvell, G. Lindqvist, and C. Ketels systematise international evidence on cluster initiatives and their organisational models [17].

At the same time, E. M. Bergman and E. J. Feser in *Industrial and Regional Clusters: Concepts and Comparative Applications (1999)* provide an operational framework for comparative cluster analysis [18]. Within Ukrainian scholarship, clusterization has been adapted to the objectives of national economic policy, with particular emphasis on organisational and institutional mechanisms of cluster formation and their contribution to enterprise and regional competitiveness [9-13].

Table 1. Stages in the development of the clusterization concept and the contribution of key scholars

Stage	Approximate period	Key scholars	Core contribution to clusterization theory	Methodological focus
Localisation theories and external effects	<i>Late 19th century to mid-20th century</i>	A. Marshall [1]	Substantiation of localisation externalities and advantages of spatial concentration	Microeconomic mechanisms of localisation
Industrial districts as socio-economic systems	<i>Second half of the 20th century</i>	F. Pyke, G. Becattini, and W. Sengenberger [14]	Interpreting local production systems as communities with interaction norms and institutional embeddedness	Socio-territorial approach
Flexible specialisation and networked production	<i>1980s</i>	M. Piore and C. Sabel [15]	Explaining competitive advantages of local specialised networks vis-à-vis mass production	Organisational evolution of production
Collective efficiency and joint action	<i>1990s</i>	H. Schmitz [16]	Integrating external economies and joint action as a source of additional performance	Institutional and cooperative analysis
Cluster as a driver of competitiveness		M. Porter [2; 3]	Conceptualising clusters as concentrations of interconnected firms and institutions; linking to productivity and innovation	Competitive-advantage paradigm
Formalisation of agglomeration and spatial equilibria		P. Krugman [4]	Modelling concentration through increasing returns and cumulative spatial forces	New economic geography
Institutionalisation, policy design, and empirical validation	<i>1999 to present</i>	OECD [6], EC [5], UNIDO [8], M. Delgado, M. Porter, S. Stern within (NBER) [7], O. Sölvell, G. Lindqvist, C. Ketels [17], E. M. Bergman and E. J. Feser [18]	Policy and instrument design; methodological standardisation; development of empirical impact assessments; operationalisation of cluster initiatives and comparative frameworks	Development policy and performance measurement

Source: compiled by the authors

Note. The stages synthesise parallel strands; references are representative rather than strictly chronological.

For operational purposes, the identified evolution can be represented through two complementary analytical dimensions. The first reflects the historical trajectory of scholarly approaches to clusterization and the logic of cumulative theoretical refinement (Table 1). The second captures differences in methodological perspectives through which clusterization is studied (spatial, competitive, institutional, and policy-instrumental), which directly affects cluster identification criteria and the selection of empirical indicators (Table 2).

Table 2. Comparative matrix of theoretical and methodological approaches in clusterization studies

Approach	Central performance mechanism	Typical cluster identification criteria
Localisation [1]	localisation externalities	spatial proximity, specialisation
Socio-territorial (districts) [14]	interaction of economic and social factors	local embeddedness, stable ties, norms of interaction
Organisational-evolutionary [15]	flexible specialisation, adaptive cooperation	network ties, capacity for rapid reconfiguration
Institutional-cooperative [16]	collective efficiency (externalities plus joint action)	cooperation intensity, coordination mechanisms
Competitive (Porterian) [2; 3; 7]	productivity, innovation, competition	complementarities, related industries, value chains
Spatial-formalised [4]	increasing returns, cumulative spatial forces	concentration, core-periphery patterns, spatial inequality
Policy-instrumental [5; 6; 8; 17; 18]	coordinated development and competitiveness support	support programmes and institutions, services, infrastructure

Source: compiled by the authors

Importantly, the same observed territorial concentration may yield different analytical conclusions depending on whether performance is attributed primarily to localisation externalities, competitive dynamics, or coordinated collective action. This distinction explains the persistent heterogeneity of identification criteria in the literature and in applied policy practice.

Building on the conceptual evolution outlined above, it is analytically important to examine what enables clusters to emerge and remain viable in a national economy, because theoretical definitions acquire practical meaning only through the conditions that transform spatial proximity into sustained productivity and innovation effects.

Cluster formation is primarily driven by the presence of a critical mass of firms and specialised capabilities across related and supporting activities, which allows complementarities, rivalry, and repeated interactions to generate upgrading dynamics rather than simple co-location [2; 3]. The availability of specialised human capital and innovation infrastructure, including universities, research and technology organisations, vocational training, and applied quality services, further determines whether knowledge diffusion and learning become systemic within the cluster environment [6; 8]. In turn, the long-term functioning of clusters depends on coordination capacity and governance arrangements that enable collective action, reduce transaction costs of cooperation, and support joint initiatives such as training, shared infrastructure, and collaborative innovation projects [8; 17].

At the macro level, the institutional and regulatory environment conditions cluster sustainability through the predictability of rules, competition policy, contract enforcement, and intellectual property protection, which jointly influence incentives to invest and cooperate in innovation-intensive activities [5; 6]. Finally, clusters are increasingly shaped by external connectivity, as integration into international markets and value chains affects access to technologies, partners, and demand, while policy coherence and evaluation mechanisms determine whether cluster support instruments reinforce structural transformation goals rather than producing formally labelled but economically weak initiatives [5; 6].

Within contemporary regional and industrial policy discourse, clusterisation is frequently positioned alongside a wide set of adjacent concepts, which creates a non-trivial risk of analytical substitution of the cluster logic with other paradigms or instruments that operate through different causal mechanisms. Conceptually, a cluster is best treated as a territorially anchored economic system of related

activities in which specialisation, value creation linkages, competition and cooperation, and institutional embeddedness jointly generate productivity and innovation effects through proximity-based externalities and coordinated collective action [2; 3; 5]. In contrast, many “neighbouring” notions emphasise either density without sectoral relatedness, governance instruments without endogenous inter-firm interdependence, or innovation coordination frameworks whose spatial and sectoral boundaries are defined differently. The proposed differentiation criteria and representative distinctions are summarised in (Table 3).

For spatial and territorial concepts, the crucial dividing line concerns whether performance effects stem primarily from urbanisation economies and general density, or from sector-related localisation combined with sustained inter-firm and institutional interaction. Thus, *urban agglomeration* focuses on city-level density advantages such as thick labour markets, shared infrastructure, and diversified demand, without requiring a coherent sectoral system of suppliers, specialised services, and coordinated upgrading trajectories that characterise a cluster [19].

A Marshallian industrial district is closer to the cluster logic because it is grounded in local specialisation and “industrial atmosphere,” but classic treatments typically foreground small and medium-sized enterprise-based local production communities and inter-firm cooperation patterns, rather than the full configuration of modern cluster institutions, multi-scalar governance, and innovation infrastructures [1; 14].

Growth poles approaches, originating in Perroux’s theory of uneven development, usually privilege an “anchor” industry, firm, or urban node as the driver of spillovers, rather than a distributed system of related firms and institutions characterised by simultaneous rivalry and cooperation [20].

The notion of a *territorial production complex* reflects a planning-oriented logic of resource and technological complementarity within delineated regions, which differs methodologically from market-based cluster dynamics and from the cluster’s emphasis on competitive pressure as a discipline and innovation driver [21].

Table 3. Neighbouring concepts relative to clusterisation: a condensed differentiation matrix

Group	Concept	Core focus	Key distinction from a cluster
Spatial and territorial concepts	<i>Urban agglomeration</i> [19]	Density and broad urbanisation economies	Does not require sector-relatedness, value-chain architecture, or cluster institutions
	<i>Marshallian industrial district</i> [1; 14]	Local specialisation and embedded inter-firm cooperation	Typically narrower institutional configuration than modern cluster framing
	<i>Growth poles</i> [20]	Anchor-driven spillovers	Privileges a “core” driver rather than a distributed cooperative system
	<i>Territorial production complex</i> [21]	Planning-oriented complementarity	Not grounded in market-based rivalry and endogenous cluster dynamics
Territorial development instruments	<i>Industrial park</i> [22]	Serviced land and infrastructure for tenants	Co-location does not imply specialised interdependence or proximity spillovers
	<i>Science park</i> [23]	Innovation facilities and technology transfer	May lack mature supplier base, deep relatedness, and strong within-field rivalry
	<i>Special economic zone</i> [24]	Incentive and regulatory regime	A policy regime; cluster effects appear only if dense specialised linkages emerge
Innovation and institutional concepts	<i>National innovation system / Regional innovation system</i> [25; 26]	Knowledge institutions across sectors	Broader and multi-sectoral; not necessarily territorially concentrated in one field
	<i>Triple helix</i> [27]	University-industry-government interaction	A governance model that may exist within clusters but is not equivalent to them
	<i>Smart specialisation</i> [28]	Priority-setting through entrepreneurial discovery	Strategy for selection; not a structural economic configuration in itself
Chains, networks, and digital coordination	<i>Global value chains / Supply chains</i> [29]	Cross-location governance and sequencing	Can operate without territorial concentration and local institutional thickness
	<i>Business networks / Strategic alliances</i> [6]	Contractual collaboration	Often geographically dispersed and not proximity-dependent
	<i>Platform economy</i> [30]	Platform governance and network effects	Coordination via platform architecture rather than territorial specialisation

Source: compiled by the authors

Note. The concepts may overlap empirically, but they rest on different core mechanisms; the table supports correct operationalisation and helps avoid substituting clusterisation with infrastructure-based or purely strategic categories.

A separate source of confusion emerges from territorial development instruments that are sometimes labelled as “clusters” in practice, despite representing primarily infrastructural or regulatory arrangements. An *industrial park* is, by definition, a planned and serviced area that provides plots, utilities, transport access, and sometimes shared facilities to tenant firms, yet such co-location does not, by itself, imply specialised value-chain interdependencies, a shared labour market for a defined specialisation, or endogenous knowledge spillovers that are central to the cluster mechanism [22].

A *science park* (or research and technology park) constitutes an organisational and property-based model aimed at fostering innovation, technology transfer, and firm growth through professional management and linkages to research institutions, but it may operate without a mature regional supplier base, deep input–output relatedness, or strong competitive dynamics within a single specialised domain [23].

Similarly, a *special economic zone* is primarily a policy regime that alters incentives through regulatory and fiscal instruments within a delimited territory; it can host clusters, but it is not analytically equivalent to a cluster unless dense, specialised, and interaction-intensive production and innovation linkages actually materialise [24].

Within innovation and institutional concepts, the distinction concerns the level of abstraction and the unit of coordination. A *national innovation system* and a *regional innovation system* describe broader institutional architectures for knowledge creation and diffusion across multiple sectors, often without requiring a single specialised value-chain domain or a narrowly delimited territorial concentration [25; 26].

The *triple helix* model formalises the interaction of university, industry, and government as a knowledge-based development arrangement that can be embedded within clusters, yet it does not, on its own, specify the cluster’s economic structure of related industries, specialised labour markets, and proximity-based externalities [27].

Smart specialisation provides a prioritisation and governance logic for selecting domains through stakeholder-driven entrepreneurial discovery, whereas a cluster represents one possible organisational form through which activities within the chosen specialisation can be coordinated and scaled [28].

Finally, concepts centred on chains, networks, and digital coordination require separate treatment because their spatial assumptions differ. *Global value chains* and *supply chains* focus on functional sequencing and governance of production across firms and locations; clusters, by contrast, explain how territorial proximity can intensify knowledge spillovers, enable specialised suppliers and services, and support collective upgrading, even when firms are simultaneously embedded in international value chain governance [29].

Business networks and *strategic alliances* are often contractual and may be geographically dispersed, whereas clusterisation presumes a strong territorial anchor [6]. *The platform economy* coordinates interactions through platform governance, rules, and network effects, which may enable distributed ecosystems that are not dependent on territorial concentration, although platform-based coordination can complement cluster dynamics when local specialisations build shared digital infrastructures [30].

Against this conceptual background, monitoring current cluster trends in the global economy should focus on how clusters upgrade under technological acceleration, sustainability requirements, and fragmented production networks, rather than on the mere multiplication of “cluster” labels. In practice, the strongest contemporary clusters tend to evolve from production co-location into innovation- and-services-intensive systems that combine specialised firms with research, training, testing, and standard-setting capabilities [2; 3; 6].

This is visible, for example, when an advanced manufacturing cluster adds shared prototyping and certification facilities, joint supplier-development programmes, and specialised workforce pipelines with universities; or when a life-sciences cluster integrates hospitals, laboratories, start-ups, and regulatory expertise to shorten innovation cycles. Accordingly, monitoring becomes

actionable when it tracks not only spatial concentration but also interaction density and upgrading outputs, such as joint R&D and commercialisation projects, specialised skills formation, participation in export consortia, and measurable performance patterns linked to cluster composition and relatedness [5; 7; 17; 18].

In the national economy, the policy-relevant trend is the shift from generic support to evidence-based differentiation between established clusters, emerging cluster initiatives, and infrastructure-only formats that do not yet display durable inter-firm interdependence. Practically, this means treating an “industrial park” with tenants as a potential platform, but recognising cluster status only when tenant firms and local suppliers form stable value-chain linkages, develop collective services, and demonstrate repeated cooperation outcomes, such as shared training centres, joint procurement standards, or coordinated innovation projects [6; 17; 18].

A second practical example concerns SME-based specialisations: cluster programmes are most defensible where coordination failures prevent firms from capturing collective benefits, and where structured support stimulates joint action and capability building rather than distributing resources through nominal membership [8]. These monitoring principles provide a clear bridge to the concluding part of the article: they justify why conceptual precision must translate into operational criteria and why clusterisation should be evaluated through verifiable interaction structures and upgrading effects, consistent with the cluster logic articulated in the foundational and policy-oriented literature.

Conclusion. Therefore, the study confirms that clusterisation should be treated as a distinct paradigm of economic development rather than a general synonym of spatial concentration or cooperation. A cluster is understood as a territorially anchored system of related activities in which specialisation, value-creation linkages, competition and cooperation, and institutional embeddedness jointly generate productivity and innovation effects.

It has been shown that the conceptual evolution of clustering implies a shift from simple co-location to structured interdependence and repeated interaction

among firms and supporting institutions. This clarifies why clusterisation cannot be reduced to infrastructure placement or formal partnership formats.

It has been established that a key unresolved issue in research and policy is the lack of terminological unity and the frequent substitution of clusterisation by adjacent concepts and instruments that rely on different mechanisms. This weakens comparability of empirical results and may distort policy choices unless clusterisation is operationalised only where territorial specialisation coexists with durable interaction structures and measurable proximity effects.

The practical implication is that monitoring cluster development should prioritise observable upgrading mechanisms and outcomes rather than nominal “cluster” designation. Further research should refine operational criteria and metrics for identifying clusters and assessing how governance and support models affect upgrading trajectories under technological and structural change.

Література

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