

DIGITALIZATION AND THE ENTREPRENEURIAL ECOSYSTEM IN VISEGRAD GROUP (V4) COHESION REGIONS: A COMPARATIVE DESK ANALYSIS OF COHESION POLICY AND NON-INFRASTRUCTURAL BARRIERS

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ABSTRACT

Aim: A thematic synthesis enabling a qualitative comparison of cohesion policy and identifying non-infrastructure barriers affecting the development of digital entrepreneurial ecosystems (EEs) within Visegrad Group (V4) less-developed regions according to EU Cohesion Fund classification (called in the study “cohesion regions”). The aim was also to assess the effectiveness of national strategies in addressing significant shortfalls regarding human capital and e-government. **Methods:** The study relies on comparative desk research, employing thematic synthesis of qualitative research of the official EU and national reports from 2021 to 2025. The Digital Economy and Society Index (DESI) reports, national reports from 2001–2025 published in the EU series Digital Decade Country Report, and V4 national digital strategies have been analyzed to identify policy intentions and various performance gaps between policy goals and actual outcomes. **Results:** Findings suggest primary infrastructure access does not hinder V4 digital transformation, but ongoing systemic non-infrastructure barriers do. These include a skills mismatch, especially in Industry 4.0; border friction in e-government affecting digital services (scores below 40 in Poland and Hungary); and organizational conservatism, leading to low tech adoption among regional SMEs. This diminishes the likelihood of achieving the targeted convergence under the EU cohesion policy. **Conclusions:** The paper emphasizes a vital policy synchronization gap that hampers the V4’s efforts to build robust digital EE. Future policies from the country and the EU should go beyond just offering external infrastructure subsidies. Instead, they need to focus on systemic reforms, such as developing Industry 4.0 human capital and streamlining entrepreneurial e-governance. These measures will help break through institutional and organizational inertia in cohesion regions.

Key words: digitalization, entrepreneurial ecosystem, Visegrad Group, cohesion policy, digital skill, e-government, Industry 4.0

JEL codes: O33, R58, F50

INTRODUCTION

The cohesion policy strategic imperative of enhancing socio-economic convergence within the European Union has remained in line with the aims of the com-

prehensive framework called Digital Decade Policy Programme 2030 [Konomi 2025]. The requirement to achieve sustainable regional development and to empower the entrepreneurial ecosystem (EE) in less-developed regions is digitalization, characterized

by infrastructure expansion, skills development, and e-governance.

An important case in this convergence dilemma is the Visegrad Group (V4), which includes Poland, Czechia, Slovakia, and Hungary. These countries have a history of economic transition, meaning that their developmental shortcomings are similar, especially in the areas where they are united [Gyimesi 2021]. Although the V4 records high fixed broadband coverage, key performance indicators vital to a successful digital EE, such as the digital skills and the digital transformation of businesses, are consistently below the EU average [EC 2025a, EC 2025b]. It is reported that SMEs' adoption of innovative technologies is low, and identified gaps in policies hinder the scalability of start-ups across borders [EC 2021, EC 2022]. To summarize on this research work, the term "cohesion regions" is used to denote the less-developed regions as well as transition regions that can be classified according to the NUTS 2 classification by the EU, as the cohesion policy can be granted to regions whose GDP per capita levels are below the average of the EU. Additionally, national strategy documents, including those in Slovakia, are explicitly focused on overcoming the acute skills gap emerging from rapid fourth industrial revolution development, which presents a considerable qualitative bottleneck to entrepreneurial capacity [MIRRI SR 2023, Turcan and Pojar 2024].

AIM AND METHOD

Existing literature provides quantitative benchmarks and broad policy outlines for the V4. However, a structured comparative desk analysis that synthesizes policy mechanisms and qualitative, non-infrastructure barriers impacting the digital EE, specifically within the cohesion regions, is currently lacking.

This paper aims to conduct a comparative synthesis of V4 national and EU-supported strategies, and of non-infrastructure barriers, influencing the development of the digital entrepreneurial ecosystem in their respective cohesion regions.

The study addresses the following questions:

1. What is the comparative effectiveness of V4 national strategies in addressing the digital skills deficit within their entrepreneurial ecosystems?

2. How do the levels of digital public services (e-governance) compare across the V4, and how do policy shortcomings affect the ease of start-up creation?
3. What key non-infrastructure barriers (e.g., policy implementation gaps, cultural factors) are identified in official reports as hindering the digital entrepreneurial capacity of V4 cohesion regions?

This study utilizes a comparative desk research methodology combined with thematic qualitative synthesis, consistent with scholarly practice for policy-focused economic analysis in transitional economies [Konomi 2025]. This approach involves systematically reviewing and synthesizing official documents, policy reports, and secondary academic sources to address the defined research questions.

The analysis is based on a structured sample of European Union (EU) and Visegrad Group (V4) national policy documents and data reports, selected for their direct relevance to the digital entrepreneurial ecosystem in cohesion regions:

1. EU benchmarks (digitalization status): The Digital Economy and Society Index (DESI) reports provide critical quantitative benchmarks on connectivity, human capital (skills), and the digitalization of public services (e-governance) for all V4 countries [EC 2021, EC 2022]. The annual reports for Czechia and Poland called Digital Decade Country Report offer the most recent policy goals and performance evaluations [EC 2025a, EC 2025b].
2. National strategy (policy mechanisms): Documents such as National Digital Skills Strategy of the Slovak Republic for 2023–2026 detail specific national action plans to address digital skills deficits, a critical component of policy synthesis [MIRRI SR 2023].
3. Academic comparative analysis (barriers): Secondary academic sources, including comparative studies on Industry 4.0 platforms in the V4 [Gyimesi 2021] and the impact of technology on skill requirements [Turcan and Pojar 2024], provide the qualitative framework for identifying common non-infrastructure barriers and policy implementation deficits.

The selection of documents was done according to four directions: (i) official authorship by institutions on the EU or national level, (ii) directly related to the sphere of digitalization, entrepreneurial ecosystems, or cohesion policy, (iii) similarity of indicators included across V4 countries, and (iv) the latest publication in the policy cycle.

The analysis proceeds in three steps: data charting, thematic coding, and comparative synthesis. Firstly, relevant indicators and policy objectives from the DESI [EC 2021, EC 2022] and the Digital Decade Country Report series [EC 2025a, EC 2025b] are charted across the V4. Secondly, the thematic coding process is applied to all policy documents to isolate specific actions and qualitative statements related to human capital, e-government, and business adoption. Finally, comparative policy synthesis is employed to identify commonalities, divergences, and best practices in addressing digital barriers across the V4 cohesion regions, directly answering the research questions.

Being a desk-based study, this study uses policy documents and aggregate indicators, which limit the capture of informal practices, regional administrative diversity, and firms' experiences.

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

This paper analyzes the digital entrepreneurial ecosystem within the V4 cohesion regions, necessitating a clear definition of the core concepts and a review of the theoretical and empirical links between digitalization and regional entrepreneurial vitality.

The entrepreneurial ecosystem concept

The entrepreneurial ecosystem (EE) shifts the focus from individual firms or entrepreneurs to the holistic environment that fosters and sustains new venture creation and growth [Volkman et al. 2021]. It is defined as a set of interconnected actors (e.g., universities, venture capitalists, support organizations), institutions (e.g., government, legal framework), and factors (e.g., culture, human capital, finance) that combine to create a regional environment conducive to entrepreneurship [Stam 2015]. A fundamental characteristic of the EE is that its performance is determined not by

the strength of any single component, but by the quality of the interactions and flows between them. For instance, substantial financial capital is ineffective without skilled human capital and a supportive regulatory culture.

Digitalization as a cross-cutting entrepreneurial ecosystem factor

Digitalization is the transformative process that affects every component of the EE, serving as a 'meta-driver' rather than just a single factor [Autio et al. 2018]. Its impact is felt across three primary dimensions relevant to the V4 cohesion regions:

1. Digital infrastructure: provides the foundational connectivity (broadband, 5G), reducing the geographical friction that historically disadvantaged cohesion regions [EC 2022].
2. Digital public service: digital public services (e-governance) involve modernizing policy and administrative processes, which could directly affect the policy component of the EE by potentially lowering bureaucratic barriers to entry and operation [EC 2021].
3. Digital capabilities: This dimension encompasses the necessary human capital (skills) and business culture to adopt and integrate digital technologies [Gyimesi 2021]. It is particularly critical in transitional economies where legacy systems and traditional business practices are prevalent.

The challenge of Industry 4.0 and skills in transitional economies

The digital challenge of the V4 is best perceived through the shift to Industry 4.0, the integration of physical and digital in production and services. Nations within the V4 recognize the need for digitalization to achieve economic success. However, they lack specific skills, education, and incorporation of such new technologies into companies [Gyimesi 2021].

As mentioned in the literature, the change to Industry 4.0 results from a severe skills mismatch, a critical qualitative obstacle in the human capital aspect of the EE. Țurcan and Pojar [2024] confirm that Industry 4.0 requires transforming specific occupational skills into sophisticated transversal, data analytics, cybersecurity, problem-solving, and traditional technical skills. In underdeveloped regions, the inability

to quickly produce or retain this specialized human capital directly kills the creation and development of new digital start-ups. In addition, the Slovak Digital Skills Strategy for 2023–2026 acknowledges that this deficit is not only an issue of availability but also one of retention and institutional flexibility in the education system [MIRRI SR 2023].

Industry 4.0 is conceptualized in this paper as: (i) a structural technological shift, transforming the skills requirements and business models, (ii) a policy goal, which is included in the digitalization strategies of nation states and the EU. This role of duality is especially applicable to transitional economies, where policy ambition is usually ahead of institutional capacity and human capital.

Accordingly, this analysis presents the problem of the entrepreneurial ecosystem in V4 cohesion regions as one that is grappling with both the challenges of the requirements of Industry 4.0 and legacy systems to be adapted to and the challenges of systemic, non-infrastructural barriers (such as policy fragmentation and skills mismatches) to hinder the required convergence that cohesion policy facilitates. This conceptual model will be applied in the following policy synthesis to classify the desk research findings.

POLICY ANALYSIS AND COMPARATIVE RESULTS

The comparative analysis of the V4 cohesion regions reveals a pattern of strong infrastructural commitment juxtaposed with significant systemic weaknesses in human capital and public service delivery, hindering the full potential of their digital EEs. The synthesis is organized around the key components of the EE.

Digital infrastructure and connectivity (base layer)

The foundational layer of the digital EE – connectivity – shows relative strength across the V4, primarily due to targeted cohesion policy funding [EC 2023]. However, disparities exist between national policy aims and regional rollout, which affect entrepreneurial access (Table 1).

The V4 countries have made significant progress in national connectivity, with Poland and Hungary in particular demonstrating ambitious targets for fixed broadband take-up (full fiber connection delivery services – FITP) and nationwide 5G coverage, often surpassing or narrowing the gap with the EU average [EC 2025b]. This level of infrastructure generally provides a sufficient foundation for basic digital start-up operations. However, the major challenge lies in the uneven quality of rollout across cohesion regions, especially in non-capital NUTS 2 and NUTS 3 areas. Despite high national 5G coverage, the widespread deployment of very high-capacity networks (VHCNs) – a key prerequisite for Industry 4.0 and advanced business services – remains insufficient. Czechia, for example, lags behind in VHCN rollout, which limits the ability of innovative enterprises in its regions to adopt data-intensive technologies such as advanced cloud computing and real-time data analytics [EC 2025a]. Although national Industry 4.0 platforms correctly identify digitalization as a central economic priority [Gyimesi 2021], implementation tends to focus on urban-industrial centers, leaving smaller and rural cohesion regions affected by persistent last-mile infrastructure deficits that hinder the development of geographically dispersed digital

Table 1. Comparative digital performance of V4: key digital entrepreneurial ecosystem indicators

Indicator	Poland (PL)	Czechia (CZ)	Slovakia (SK)	Hungary (HU)	EU average
Basic digital skills [% of individuals]	low/below average	near/below average	below average	below average	~54
ICT specialists [% of employment]	below average	near/at average	below average	below average	~4.5
SMEs with at least basic digital intensity [%]	lagging	progressing	lagging	lagging	~69
Cloud computing take-up [% of enterprises]	below average	below average	below average	below average	~42
VHCN coverage [% of households]	progressing	lagging	progressing	progressing	~70

Source: EC [2022], EC [2025a], EC [2025b].

enterprises [EC 2024]. Although Czechia performs comparatively better in terms of specialists in the field of information and communication technology (ICT), availability is concentrated structurally in metropolitan areas, thus restricting the spillover of these effects to cohesion areas. This implies that the performance in a country conceals the presence of inequalities at a sub-regional level, which is vital in the development of the entrepreneurial ecosystem.

Human capital and digital skills (the critical barrier)

The most pronounced qualitative barrier identified across the V4 is the deficit in human capital, which directly threatens the sustainability of their digital EEs. This analysis answers Research Question 1.

Despite sustained national efforts, the proportion of individuals possessing at least basic digital skills remains insufficient in several V4 countries. Although Czechia and Poland are making notable progress in this area, a substantial shortage of ICT specialists persists, representing a critical constraint for any start-up ecosystem [EC 2022, EC 2025c]. This quantitative deficit is particularly acute in cohesion regions, where brain drain toward capital cities and Western Europe further weakens local labor markets. In response, some countries have introduced targeted policy measures, with Slovakia providing a clear example through its National Digital Skills Strategy for 2023–2026, which explicitly prioritizes the development of ICT specialists, youth digital skills, and active labor market interventions, including actions aligned with the European Recovery Plan [MIRRI SR 2023]. Nevertheless, ac-

ademic literature emphasizes that the challenge extends beyond the sheer number of skilled workers. The rapid transition toward Industry 4.0 requires a qualitative shift toward transversal competencies – such as data literacy, critical thinking, and complex problem-solving – which traditional education systems in the V4, particularly within regional vocational education, have been slow to deliver [Turcan and Pojar 2024]. This mismatch between skills supply and technological demand creates a structural bottleneck: even where financial support is available, enterprises in cohesion regions often cannot recruit the talent necessary to implement advanced digital business models. While policy intent across the V4 is broadly aligned, implementation effectiveness varies, with Czechia’s relatively stronger performance in ICT specialists likely reflecting a more mature educational base than that of Hungary or Poland. Overall, the qualitative synthesis indicates that the skills gap constitutes the most restrictive non-infrastructure barrier to scaling digital entrepreneurship in V4 cohesion regions.

Digital public services (e-governance)

The efficiency of digital public services (DPS) is a key determinant of the policy component of the EE, directly impacting the ease and cost of launching and operating a business. This analysis answers Research Question 2 (Table 2).

The V4 countries, particularly Poland and Hungary, have historically lagged behind in the provision of cross-border digital public services, a key indicator of digital state capacity [EC 2021]. Although national e-government services for citizens have shown gradual improvement, the specific services

Table 2. Performance of the e-governance and policy friction: digital public services for businesses in V4

Indicator	Poland (PL)	Czechia (CZ)	Slovakia (SK)	Hungary (HU)	EU average
Digital public services for businesses (overall score)	below average	progressing	below average	below average	~75
Cross-border services (score 0–100)	<40	~45–60	~45–60	<40	~65
Availability of eID (key enabler)	lagging	progressing	progressing	lagging	~50
User support for e-services (score 0–100)	<40	~70+	~70+	<40	~70.7

Note: In scale 0–100 means the best.

Source: EC [2021].

required by digital entrepreneurs – such as remote company registration, cross-border VAT compliance, and secure digital identification (eID) for international transactions – remain underdeveloped. This policy gap generates significant friction for emerging digital start-ups, which are inherently oriented toward regional and international markets. In the absence of seamless cross-border e-government services, entrepreneurs face higher administrative burdens, slower scaling trajectories, and increased operational costs, placing them at a competitive disadvantage relative to firms operating in Western EU countries [EC 2021]. While policy emphasis within the V4 differs, with Czechia demonstrating stronger overall performance in citizen-oriented e-government usage and Poland focusing more intensively on cybersecurity measures across different levels of government – an essential prerequisite for secure digital public services [EC 2025c] – a common structural weakness persists. National digital strategies continue to prioritize general citizen services, rather than systematically addressing the specific needs of digital entrepreneurs, thereby reinforcing cross-border digital public services as a policy-induced barrier to the development of the digital entrepreneurial ecosystem.

Business digital adoption and Industry 4.0 barriers

The final thematic area focuses on the EE's business adoption component, which is the ultimate test of digitalization policies. This addresses Research Question 3.

Official reports consistently identify the slow adoption of advanced digital technologies – such as artificial intelligence, cloud computing, and big data – by small and medium-sized enterprises as a major systemic weakness across the V4 countries, including Czechia and Poland [EC 2025a, EC 2025b]. This pattern reflects not only technological inertia but also deeper organizational conservatism and limited managerial capacity within regional SMEs. Although national strategies, including the V4 Industry 4.0 platforms, explicitly aim to stimulate the uptake of advanced technologies [Gyimesi 2021], qualitative evidence indicates a substantial gap between policy intent and regional implementation. In cohesion regions, SMEs frequently lack the organi-

zational capital and strategic capabilities required to undertake high-risk technological investments [Türcan and Pojar 2024]. This reluctance is further reinforced by persistent skills shortages, creating a self-reinforcing cycle in which firms are unable to adopt Industry 4.0 technologies due to insufficient human capital, while skilled workers migrate toward metropolitan centers in search of more advanced career opportunities. Beyond organizational and human capital constraints, the desk research also aligns with findings from the literature on transitional economies, which highlight limited access to diversified financing – particularly risk capital and venture funding – as an additional, though secondary, barrier to digital start-up growth [Konomi 2025]. As a result, many early-stage digital firms in cohesion regions remain dependent on traditional debt-based financing instruments that are poorly suited to high-risk, high-growth digital business models. The absence of robust regional venture capital ecosystems, therefore, constitutes a critical non-infrastructure financial constraint. Taken together, the synthesis of the evidence indicates that digital entrepreneurship in V4 cohesion regions is primarily hindered by a triad of interrelated non-infrastructure barriers: a persistent mismatch between Industry 4.0 skill requirements and available human capital, structural friction arising from gaps in cross-border digital public services, and entrenched organizational conservatism combined with low managerial risk appetite for advanced technology adoption among regional SMEs.

DISCUSSION AND POLICY IMPLICATIONS

Interpretation of persistent barriers

The synthesis demonstrates that the digital entrepreneurial gap in V4 cohesion regions is not primarily an issue of hardware access but systemic, non-infrastructure inertia [Gyimesi 2021]. The persistence of the identified barriers can be interpreted through three lenses standard to transitional economies [Konomi 2025]:

1. Policy fragmentation versus systemic integration: National and EU policies often address digitalization as separate components – for instance, funding infrastructure (cohesion policy) versus training skills (ESF+). However, the entrepreneurial eco-

system requires systemic integration. Funding high-capacity networks is ineffective if the simultaneous policy to generate Industry 4.0 specialists [Türkan and Pojar 2024] is too slow or misdirected. The core challenge is the lack of policy synchronicity: the supply of digital infrastructure outpaces the supply of digital human capital and the demand created by modernized e-governance.

2. Institutional path dependence (e-governance): The slow progress in cross-border DPS indicates institutional path dependence. Modernizing public administration requires deep, often politically challenging, reforms to legacy bureaucratic systems. Since e-government services for citizens often receive priority for political visibility, the less visible but economically critical services for digital businesses (e.g., eID for entrepreneurs, remote legal entity formation) are consistently deprioritized [EC 2021]. This creates a structural barrier to scaling digital ventures beyond national borders.
3. Organizational conservatism and risk aversion: Regional SMEs' low adoption rates of advanced technologies (AI, cloud computing services) stem from deep-seated organizational conservatism. Many regional firms prefer incremental efficiency gains over radical digital transformation due to perceived risk, cost, and the unavailability of skilled internal management and IT staff [EC 2025a]. This risk aversion in the business culture of cohesion regions is a significant non-infrastructure drag on the entire digital EE.

According to recent research on the role of digital entrepreneurial ecosystems, skills, the ability to govern, and institutional trust are increasingly more important than infrastructure for resource in the regional performance of entrepreneurship, as in Audretsch et al. [2019], Spigel and Harrison [2022]. The results align with the literature in EE, which highlights the role of interaction quality as a prerequisite for ecosystem performance rather than the individual strength of factors [Stam 2015]. These interactions are deterred in the V4 cohesion regions by broken policy enactment and curbed self-reinforcement of ecosystems.

Policy implications and recommendations

To effectively address the digital EE gap in V4 cohesion regions, policy interventions must shift focus from broad infrastructure spending to targeted, synergistic support for human and organizational capital.

Recommendations for national governments (V4):

- Integrated Industry 4.0 skill retooling: National policies (like the Slovak one) must explicitly integrate educational pathways with regional industrial demands. This requires prioritizing transversal digital skills for existing SMEs workforces, focusing on data literacy and cloud management, delivered through regional training hubs [Türkan and Pojar 2024].
- Prioritize entrepreneurial e-governance: Governments must urgently prioritize and ring-fence funding for the “business layer” of digital public services. Specifically, accelerate the rollout of mandatory, cross-border eID solutions and digitized business registration processes to reduce friction for start-ups aiming for the single market [EC 2021].

Recommendations for the European Commission (cohesion policy):

- Conditional cohesion funding on systemic change: Future cohesion policy (post-2027) should more rigorously tie digital funding to evidence of systemic policy synchronicity. Infrastructure funding should be conditional on simultaneous, measurable progress in regional digital skills attainment and improved DPS for businesses in the target cohesion region, rather than relying solely on national average figures.
- Targeted SMEs digital vouchers: To overcome organizational conservatism, the European Commission should promote regional schemes that offer highly subsidized, risk-mitigated digital adoption vouchers specifically for advanced technologies (AI/cloud computing services) [EC 2025a]. These vouchers must include human capital training alongside technology adoption, effectively subsidizing both the software and the necessary skills acquisition to drive fundamental transformation at the micro-level.

- Encourage regional risk capital: According to the financial barriers analysis, the latter ought to be used by the European Commission and European Investment Fund (EIF) to launch special digital seed funds for V4 cohesion regions [Konomi 2025]. This would add much-needed risk capital and venture experience in the regional markets, breaking the current reliance on traditional debt funding, which is not conducive to the growth of digital start-ups.

CONCLUSIONS

This paper aimed to compare policy summaries of national and EU-based policies supported by V4, and to examine non-infrastructure barriers to the digital entrepreneurial ecosystem (EE) within their respective cohesion regions. In the focus, through comparative desk research and thematic qualitative synthesis, the research may substantiate the acute split between good intentions and the low implementation efficacy of infrastructure policy regarding human and organizational capital.

The most significant conclusions are that connectivity ceases to be the force worth being pulled by the V4 digital EE, but becomes a chronic systemic, tripartite and non-infrastructure drag:

1. Skills mismatch: A shortage of specialized ICT labor combined with the slow adoption of transversal Industry 4.0 skills by regional vocational systems [Turcan and Pojar 2024].
2. Friction of e-governance: A distinct policy deficit in developing seamless cross-border digital public services for businesses [EC 2021] directly increases operational costs for digital start-ups.
3. Organizational conservatism: A low managerial risk appetite among regional SMEs creates a low demand for advanced technologies and skilled labor, which defines a dynamic digital EE [EC 2025a].

This paper's unique aspect and value lie in its explicit focus on discussing the V4 cohesion regions as the unit of analysis, beyond national averages, to integrate policy intent with the qualitative barriers to its implementation. Organizing the analysis using the EE framework, the research gives an in-depth, compar-

ative view of the systemic character of the digital transformation challenge, where the national strategies – such as the Slovak Digital Skills Strategy for 2023–2026 [MIRRI SR 2023] – are successful in diagnosing the problem, yet are unable to accomplish the synchronicity of all the EE components.

The main weakness of this research is that it relies on secondary research (desk research) that provides policy intent and aggregate performance scores but does not provide detailed, real-time information on day-to-day interactions between entrepreneurs and local public administrations.

Future studies must work on quantitative validation. Namely, empirical quantification of the relationship between the convenience of international digital business services and the survival frequency of start-ups in V4 cohesion areas should be carried out to test the mechanisms of interaction policy assumed in this paper, not only by DESI scores. It would provide necessary evidence to help plan the strategic implementation of future cohesion policy funding.

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CYFRYZACJA ORAZ EKOSYSTEM PRZEDSIĘBIORCZOŚCI W REGIONACH SPÓJNOŚCI GRUPY WYSZEHRADZKIEJ (V4): ANALIZA PORÓWNAWCZA POLITYKI PUBLICZNEJ I BARIER POZAINFRASTRUKTURALNYCH

STRESZCZENIE

Cel: Synteza tematyczna umożliwiająca porównanie jakościowe polityki publicznej oraz identyfikację barier pozainfrastrukturalnych wpływających na kształtowanie cyfrowych ekosystemów przedsiębiorczości (EE) w regionach Grupy Wyszehradzkiej (V4), które zgodnie z klasyfikacją Funduszu Spójności UE mają status słabiej rozwiniętych (w badaniu określono je jako regiony spójności). Celem była także ocena skuteczności strategii krajowych w niwelowaniu istotnych niedoborów w obszarze kapitału ludzkiego oraz administracji elektronicznej (*e-government*). **Metody:** Analizę porównawczą *desk research* oficjalnych raportów Unii Europejskiej oraz krajowych dokumentów strategicznych państw Grupy Wyszehradzkiej (V4) z lat 2021–2025 przeprowadzono z wykorzystaniem syntezy tematycznej danych jakościowych. Analizie poddano w szczególności raporty Digital Economy and Society Index (DESI), raporty krajowe z lat 2001–2025 w ramach sprawozdań publikowanych w serii Digital Decade Country Report, a także krajowe strategie cyfrowe państw V4 w celu identyfikacji intencji politycznych oraz określenia luk pomiędzy deklarowanymi

założeniami strategii publicznych a ich faktycznymi rezultatami wdrożeniowymi. **Wyniki:** Uzyskane wyniki wskazują, że podstawowy dostęp do infrastruktury nie stanowi istotnej bariery dla transformacji cyfrowej w krajach V4, zaś systemowe bariery pozainfrastrukturalne nadal się utrzymują. Obejmują one niedopasowanie kompetencji w szczególności w obszarze przemysłu 4.0, tarcia transgraniczne w *e-government* wpływające na usługi cyfrowe (wyniki poniżej 40 punktów w Polsce i na Węgrzech) oraz konserwatyzm organizacyjny prowadzący do niskiego poziomu adopcji technologii przez regionalne MŚP. Czynniki te ograniczają prawdopodobieństwo konwergencji zakładanej w ramach polityki spójności. **Wnioski:** Artykuł podkreśla istnienie istotnej luki w synchronizacji strategii publicznych, która osłabia wysiłki państw V4 na rzecz budowy trwałych cyfrowych ekosystemów przedsiębiorczości. Przyszłe działania strategiczne na poziomach krajowym i unijnym powinny wykraczać poza subsydiowanie infrastruktury zewnętrznej i koncentrować się na reformach systemowych, takich jak rozwój kapitału ludzkiego dla przemysłu 4.0 oraz usprawnienie elektronicznej administracji zorientowanej na przedsiębiorców. Działania te mogą przyczynić się do przełamania inercji instytucjonalnej i organizacyjnej w regionach objętych polityką spójności.

Słowa kluczowe: cyfryzacja, ekosystem przedsiębiorczości, Grupa Wyszehradzka, polityka spójności, kompetencja cyfrowa, e-administracja, przemysł 4.0