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# REGIONAL FEATURES OF THE DEVELOPMENT OF THE SMART ECONOMY OF UKRAINE IN THE CONTEXT OF GLOBAL DIGITALISATION TRENDS

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**Abstract.** The digitisation of economic activity is a pivotal factor in enhancing the productivity, transparency and innovation of business processes, ensuring rapid data exchange and access to global markets. It has been demonstrated that the aforementioned factors contribute to the creation of new business models, reduce transaction costs and form competitive advantages in the global digital economy. The article examines the peculiarities of the implementation of digitalisation policies in developed countries, identifies the peculiarities of the innovation development strategy, and conducts a comparative analysis of existing approaches in developed countries. The identification of salient features thus enabled an analysis of Ukraine's digitalisation policy in the context of prevailing global trends and the ongoing state of war. The research was conducted through the administration of surveys to business representatives regarding their collaboration with other stakeholders and the extent of their utilisation of digitalisation and digital recovery policies in the process of rebuilding and relocating businesses. Digitalisation is emerging as a pivotal catalyst for regional advancement in Ukraine, fostering the establishment of a smart economy, even within regions that have traditionally experienced limited development. In the contemporary geopolitical landscape, characterised by profound challenges related to military situations and the pressing need for strategies focused on post-war recovery, this process assumes a particularly salient role. A multi-level approach to digital transformation is dictated by the specific characteristics of Ukraine's regions, which demonstrate varying degrees of readiness to implement modern digital solutions. Western regions, including Lviv, Ivano-Frankivsk, and Ternopil, are distinguished by their accelerated development in digital services, advanced logistics, educational technologies, and the establishment of IT clusters. This progress establishes the basis for the subsequent scaling of their achievements and the integration of regional successes into the national context. The central part of the country is characterised by significant opportunities for the digitalisation of the agro-industrial complex and industrial sectors, where the latest technologies can become a key factor in productivity growth and production process optimisation. Conversely, the Eastern and Southern regions encounter a multitude of obstacles that impede their digital advancement. In this context, it is imperative to implement measures that will result in a substantial enhancement of the infrastructure base, with particular emphasis on the domains of energy, public safety, and the acquisition of technical equipment to augment production capacities. The establishment of a smart economy necessitates a bespoke approach to each region, with consideration for numerous factors, including natural resources, the digital competence of the population, human resources, and the investment attractiveness of the territories. The successful implementation and development of these approaches is significantly influenced by public-private partnerships. The present interaction facilitates the implementation of projects that are intended to develop infrastructure, establish modern industrial parks, launch innovative startups and prepare educational programmes with the aim of deepening digital literacy. The advent of global digitalisation trends has engendered a plethora of novel prospects for Ukraine to integrate into the European Union's digital sphere, to attract foreign technological investment, and to establish competitive smart regions on the international stage. In the context of martial law, the introduction of smart solutions is becoming a critically important means of managing urban

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infrastructure, ensuring uninterrupted business operations, and guaranteeing the availability of digital services to the population. The efficacy of such models is contingent upon the implementation of multi-level development strategies that are designed to address prevailing impediments and establish sustainable foundations for prosperity within each region.

**Keywords:** digitalisation, digital policy, innovative development, post-war development, smart economy, regionalisation.

**JEL Classification:** O33, O38, O57, F63, Q55

## 1. Introduction

There is now no doubt that Ukraine's post-war recovery and economic development must be based on progressive smart economy principles, including modern digitalisation, sustainable development, and innovative resource management approaches. Today, entrepreneurial activity in Ukraine largely depends on the region in which it takes place, the risks associated with war and ongoing military operations, and the extent to which access to resources and infrastructure is critical for businesses. It also depends on whether there are currently effective ways to overcome these problems and threats. Furthermore, it is imperative to acknowledge the relocation of business structures and production capacities, both within Ukraine and, on occasion, to foreign countries. It is evident that these factors exert a significant influence on the efficacy of economic activity and the propensity of businesses to adopt the concept of smartisation, which is predominantly characterised by the intellectualisation and digitalisation of activities. Digitalisation has become a determining factor in global development, not just a technological innovation. It is transforming the economy, everyday life, education, healthcare and public administration.

In the digital age, the world's economies are competing for leadership. The European Union is implementing a strategic programme called 'Europe's Digital Decade: Digital Targets for 2030' (Europe's Digital Decade..., 2024); the United States is investing heavily in artificial intelligence development; and Asian giants such as South Korea and Singapore are setting high standards in smart technology. An increasing number of countries recognise that digital infrastructure is becoming a key factor in global competitiveness. Despite the challenges posed by war, Ukraine is integrating into the global digital landscape at an impressive rate. The Diia project is a prime example of innovative e-government solutions, and the rapid growth of the IT sector has established the country as a major exporter of technology services. This shows that digital transformation is about more than just technology; it's about adaptability, responding quickly to challenges and being ready for constant change. Digitalisation is not just a passing trend; it is an inevitable path to development and competitiveness in the modern world.

## 2. Literature Review

The present scientific approaches to the development of the smart economy are predicated on the notion of the interconnection between digitalisation, innovative activity and the institutional capacity of territories. A review of the extant literature reveals both the key global benchmarks for the transformation of regional economies and the national characteristics of the processes of implementing smart approaches in Ukraine.

As stated in the OECD report "Digital Economy Outlook 2020" (OECD (2020)), the prevailing trends in global digital transformation currently under observation include the establishment of suitable infrastructure and regulatory frameworks, the development of digital platforms, and the integration of artificial intelligence. It is evident that OECD countries are adopting a more robust strategic approach to digital transformation policy. Digital governance, connectivity and skills are identified as the top national digital policy priorities (OECD, 2024). The study observes that among the 1,200 policy initiatives tracked by the OECD, one-third are directed towards stimulating the adoption of digital technologies, social prosperity, and innovation. It is notable that artificial intelligence and 5G are the technologies most frequently mentioned.

The European approach is predicated on smart specialisation as a regional growth policy that activates the innovative potential of territories through partnerships between government, business and science. The S3 platform, established under the auspices of the European Commission, functions as a pragmatic instrument for the monitoring of the implementation of such strategies in EU countries (Inforegio - S3..., 2019).

The notion of smart regions is supported by scientific evidence, as outlined in the research of Nam & Pardo (2011). This seminal study defines the smart economy as the integration of three dimensions: technological, human and institutional. The findings of Ketels & Protsiv (2020) on European cluster initiatives are also of significance in this context, given that these initiatives function as institutional platforms for the development of the smart economy.

Storonyanska (2022) examines the practical tools of smart regional development strategies in EU countries, outlining potential areas in which the best European practices could be implemented in Ukraine.

In general, domestic research in the field of the smart economy focuses primarily on the potential for the digital transformation of regions, the institutional barriers to implementing this transformation, and the practical aspects of introducing innovative technologies (Yaremko & Yaremko, 2020). When it comes to implementing the concept of smart specialisation in Ukraine, researchers cite the following problems: weak coordination of national and regional policies, fragmented statistical data and limited business participation in innovative projects (Slynko, 2020).

## 3. Materials and Methods

The comprehensive study, "The role of business in the recovery of Ukraine's economy: development of the knowledge ecosystem in the context of the formation of a smart economy", conducted as part of the scientific project "Global smartisation as the basis for Ukraine's post-war reconstruction", enabled a thorough evaluation of Ukrainian businesses' involvement in regional knowledge ecosystems, identifying specific regional characteristics and issues in the development of a smart economy in Ukraine. The study covered the entire territory of Ukraine (excluding territories temporarily occupied by the Russian Federation) and involved 300 business entities representing a variety of economic sectors, including small, medium and large businesses.

## 4. Results

It is becoming evident that the formulation of appropriate state policy, which is informed by specific regional characteristics and challenges, has the potential to catalyse the development of the smart economy in Ukraine. Indeed, economic policy and institutional decisions have become the driving forces behind the smart economy in many countries worldwide. The most successful cases are Estonia, Singapore and South Korea.

In Estonia, the primary emphasis was placed on the utilisation of digital government as an economic strategy. The fundamental policy initiative was the concept of e-Estonia (implemented since the 1990s) (We have built..., 2025). The initiative encompassed digital services for business, e-citizenship, and automated taxation. A clear division of roles between government agencies was achieved, and the e-Governance Academy was established. The economic consequences of the strategy's implementation included a reduction in administrative expenditures and the facilitation of foreign investment through the streamlining of procedures.

Singapore is known for its Smart Nation initiative, which is a national strategy. The fundamental policy is the Smart Nation programme (implemented since 2014) (A Thriving Digital … , 2025), which invests in big data, transport automation, and smart energy systems. With regard to the institutional component, a special state agency (the Smart Nation and Digital Government Office) was established with the purpose of centralising project financing. The economic consequences of this state policy have been twofold: firstly, an increase in economic productivity and, secondly, a significant strengthening of innovation potential.

South Korea is implementing an innovative economy approach through public-private partnerships. The Creative Economy and Digital New Deal strategies (Korea's Digital... 2025) provide support for startups, develop digital infrastructure, and invest in R&D. A notable institutional feature is the close collaboration between the government, major corporations such as Samsung and LG, and scientific institutions. This policy has transformed industry and significantly increased the proportion of high-tech exports.

Poland's experience of implementing institutional modernisation and digital transformation is also interesting. Key policies include national strategies for the digitalisation of public services, logistics and education (Digitalisation of Poland 2035, 2025). Another important element of Poland's strategy is tax reform to support innovation, such as tax incentives for research and development (R&D). Successful institutional steps include establishing the Digitalisation Agency (Centralny Ośrodek Informatyki) and ensuring effective coordination between the Ministry of Digital Affairs, the Ministry of Economy, and municipalities across the country. This approach has resulted in the development of a robust IT sector and substantial growth in digital startups and urban projects (e.g., smart transport in Warsaw).

The Czech Republic's strategic focus on Industry 4.0 and the promotion of public-private synergy is evidenced by the implementation of key policies aimed at modernising industry through the utilisation of digital solutions, the stimulation of digital skills, and the provision of support to industry clusters (Czech Republic..., 2025). The institutional aspects of the Czech strategy include the establishment of the National Industry 4.0 Platform, which unites businesses, scientists and the government. The government has also established an Economic Council to coordinate innovation policy. These measures have increased manufacturing productivity and attracted foreign investors to "smart manufacturing".

Lithuania is also focusing on establishing a digital state and a legal framework to encourage innovation. Key policies include a sustainable growth strategy based on the digital economy (Lithuania – Industry… , 2025). Another important area is developing the fintech environment through simplified regulations.

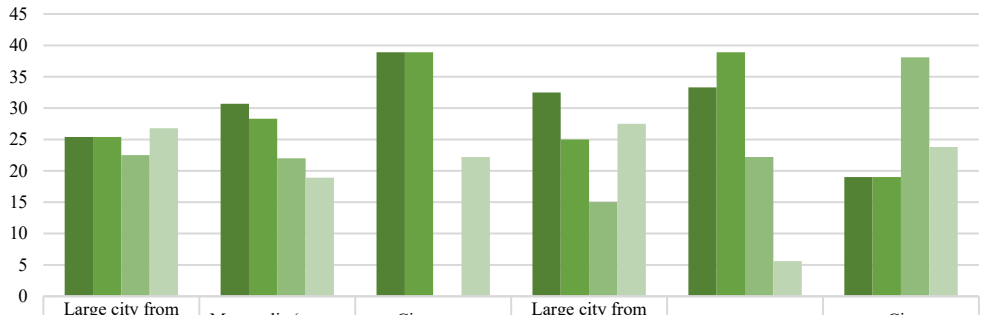
The institutional aspects of the Lithuanian strategy are of particular interest, with the country's Central Bank playing a pivotal role in driving innovation, as evidenced by the establishment of the LBChain platform for blockchain solutions. The creation of the Invest Lithuania agency and GovTech Lab is also noteworthy. Consequently, Lithuania is exhibiting accelerated growth in the fintech sector (ranked second in the EU in terms of the number of fintech companies per capita) and substantial advancement in smart public services (e.g., electronic courts, registries).

Ukraine is currently experiencing an urgent need to transition to new technologies, driven by the necessity to rebuild the economy, develop new technological conditions, and advance digitalisation in line with global trends and the country's economy (Digital Strategy..., 2024). In the context of scientific research, a business survey revealed that company representatives assess the state of their enterprises differently, taking into account the prevailing circumstances. Approximately one-third of respondents (29.7%) indicated that as of 2025, they had fully resumed their activities. It is estimated that approximately the same proportion (27.3%) had partially resumed their activities. The remaining enterprises have either commenced their operations again or indicated that they require substantial resources to do so. Qualitative assessments demonstrate significant variability, ranging from an increase in activity to a decline. The process of resuming activity demonstrated greater success in small towns and in the Northern and Western regions of Ukraine (Fig. 1).

In the context of small towns and villages, businesses are confronted with considerable challenges, necessitating augmented support to facilitate effective renewal and development. While urban centres demonstrate a higher level of adaptation, particularly thanks to advances in digitalisation, this area requires further improvement. The implementation of support policies that are tailored to the specific characteristics of each settlement is of paramount importance. This must take into account the scale of business and the level of access to digital technologies. The restoration of activity has been more successful in small towns and in the Northern and Western regions of Ukraine (Fig. 2).

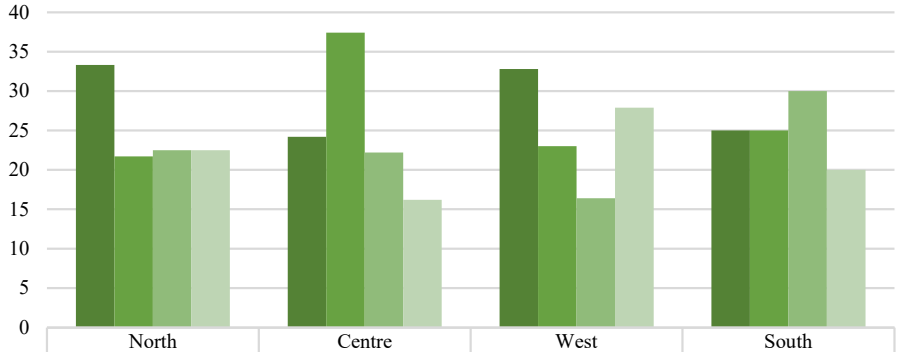
It is evident that the regions of Northern and Western Ukraine have demonstrated the most significant progress in terms of business recovery. In the Northern region, 33.3% of enterprises have been fully restored, with a further 21.7% operating partially. In the Western region, these figures are 32.8% and 23%, respectively. It is evident that a significant proportion of businesses in these regions, amounting to over 55%, persist in their operations, albeit in various forms. This can be attributed to the lower level of destruction caused by hostilities and the Western region's status as a relocation centre. Here, businesses have adapted more quickly, attracted new markets, and taken advantage of state or donor support. The Central region shows a high level of partial recovery: 37.4%. However, only 24.2% of enterprises have been fully restored. This may indicate gradual reorganisation, financial difficulties, logistical problems, or the impact of the unstable situation in certain areas. The situation in the South is the most challenging of all the regions. Only 25% of businesses have fully recovered, while 30% require significant resources to remain operational. This is due to prolonged hostilities, the occupation of territories, the destruction of infrastructure and population migration. In contrast, active adaptation is evident in Western Ukraine, where 27.9% of enterprises are in the process of recovery.

This indicator is indicative of the development of new business models, especially digital formats. The degree of business recovery is contingent upon the prevailing security conditions in the region.




| | Large city from 100,000 to 400,000 population | Megapolis (over 1 million population) | City up to 50,000 population | Large city from 400,000 to 1 million population | Village | City 50 100,000 population |
|---|---|---|---|---|---|---|
| fully restored | 25,4 | 30,7 | 38,9 | 32,5 | 33,3 | 19 |
| partially restored | 25,4 | 28,3 | 38,9 | 25 | 38,9 | 19 |
| requires significant resources to restore | 22,5 | 22 | 0 | 15 | 22,2 | 38,1 |
| in the process of recovery | 26,8 | 18,9 | 22,2 | 27,5 | 5,6 | 23,8 |

**Figure 1. Assessment of the current state of business activity taking into account military operations depending on the size of the settlement, 2025, %**




| | North | Centre | West | South |
|---|---|---|---|---|
| fully restored | 33,3 | 24,2 | 32,8 | 25 |
| partially restored | 21,7 | 37,4 | 23 | 25 |
| requires significant resources to restore | 22,5 | 22,2 | 16,4 | 30 |
| in the process of recovery | 22,5 | 16,2 | 27,9 | 20 |

**Figure 2. Assessment of the current state of business activity, taking into account military operations, depending on the region of Ukraine, 2025, %**

The Southern region requires special support programmes, infrastructure restoration and investment incentives. The North and West demonstrate examples of flexibility, successful digital adaptation and changes in business formats. It is imperative that Central Ukraine receives supplementary support to facilitate the transition from partial to full business recovery.

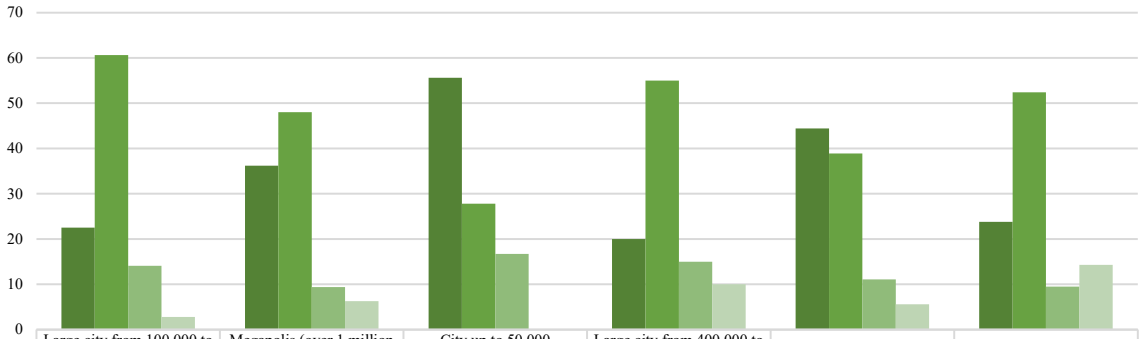
The most significant challenges to business development were identified as follows: loss of customers (69.7%), lack of qualified personnel (54%), lack of funding (46.3%), and damaged infrastructure (24.3%). Entrepreneurs from the Southern regions, and to a lesser extent those from the Centre, cite the most problems. The resources that are currently most critical for companies are investment (for 53.3% of companies that participated in the survey), technical equipment (44.3%), infrastructure (36%), and staff training (33.7%).

The results of the survey on the level of digitalisation of business activities are interesting. Around a third of companies reported that their activities are fully digitalised. Most of these companies started implementing digitalisation at the beginning of the pandemic. For many of these companies, digitalisation now includes scaling up the use of AI. At the same time, 12.3% of companies surveyed are not digitised at all and 50.3% are only partially digitised. For many companies, the lack of affordable Ukrainian software has hindered their digitisation efforts.

Most fully digitised companies are located in cities with populations of up to 50,000 (55.6%), while partially digitised companies are more prevalent in large cities (60.6%) (see Fig. 3). Fully digitised companies are more prevalent in the North of the country, whereas partially digitised companies are more common in the Centre (see Fig. 4).

It is evident that partial digitalisation has become a dominant phenomenon among Ukrainian businesses. In the Central region, 60.6% of enterprises are on the path to integrating digital solutions, which is the highest indicator in Ukraine. In the Western and Southern regions, almost half of companies have partially digitised–49.2% and 50%, respectively. Despite the traditionally high level of full digitisation in the Northern region, it is noteworthy that 42.5% of businesses are currently at an intermediate stage of digital development. In general, the majority of Ukrainian enterprises have already initiated the process of digital transformation, but have not yet completed it. The Northern region is at the forefront of full digitalisation, with 40.8% of businesses having fully integrated modern technologies. The Southern region follows with 35.0%, a result of particular significance given the challenging circumstances engendered by the war. The Western region exhibits a rate of 26.2%, while the Central region exhibits a significantly lower rate of 22.2%. The superiority of the Northern region is attributable to its advanced IT infrastructure, extensive access to skilled professionals, cloud services and automation.

Conversely, the central region is distinguished by a substantial presence of traditional and industrial enterprises, which encounter considerable challenges in their efforts to adapt to the digital age. A pervasive absence of digitalisation is evident in 10–12% of enterprises across all regions, with the most pronounced outcomes observed in the Centre (12.1%). In the North, South and West, this figure fluctuates around 10%. This suggests that, even amid active IT development and the challenges of war, around one in ten companies does not utilise digital tools. Additionally, between 5% and 6.7% of respondents were unable to determine



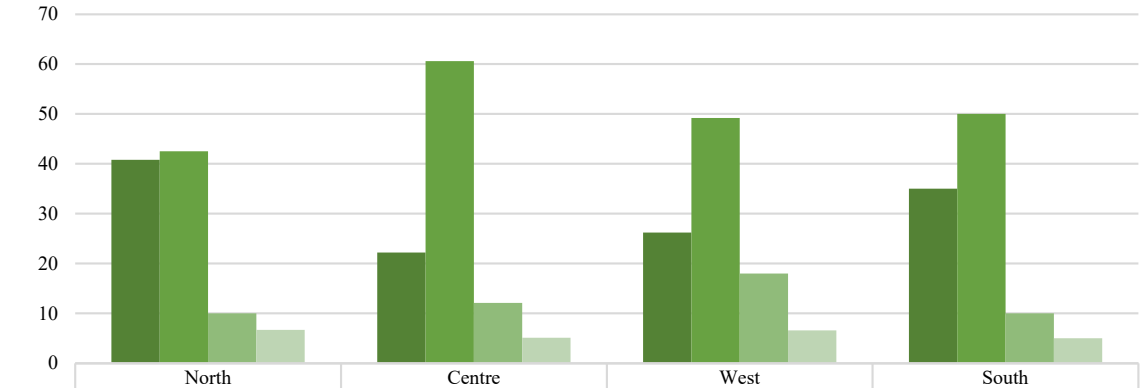

| | Large city from 100,000 to 400,000 population | Megapolis (over 1 million population) | City up to 50,000 population | Large city from 400,000 to 1 million population | Village | City 50-100,000 population |
|---|---|---|---|---|---|---|
| fully digitalised | 22,5 | 36,2 | 55,6 | 20 | 44,4 | 23,8 |
| partially digitalised | 60,6 | 48 | 27,8 | 55 | 38,9 | 52,4 |
| not digitalised at all | 14,1 | 9,4 | 16,7 | 15 | 11,1 | 9,5 |
| difficult to answer | 2,8 | 6,3 | 0 | 10 | 5,6 | 14,3 |

**Figure 3. Assessment of the level of digitalisation of a company's activities depending on the size of the settlement, 2025, %**

the level of digitalisation of their enterprises. Reasons for this could include weak management control of digital processes, an insufficient understanding of the relevant terminology, or an immature systematic approach. Partial digitalisation is already commonplace for most Ukrainian companies. The north continues to demonstrate leadership in fully integrating digital technologies, while the central region is the main centre for partial digitalisation, with the fewest companies having completed this process. At the same time, 10–12% of businesses are still completely non-digitised and require active state support. Ukrainian businesses are calling for accessible digital education, strategic IT consultancy and the development of modern infrastructure to speed up the digital transformation process.

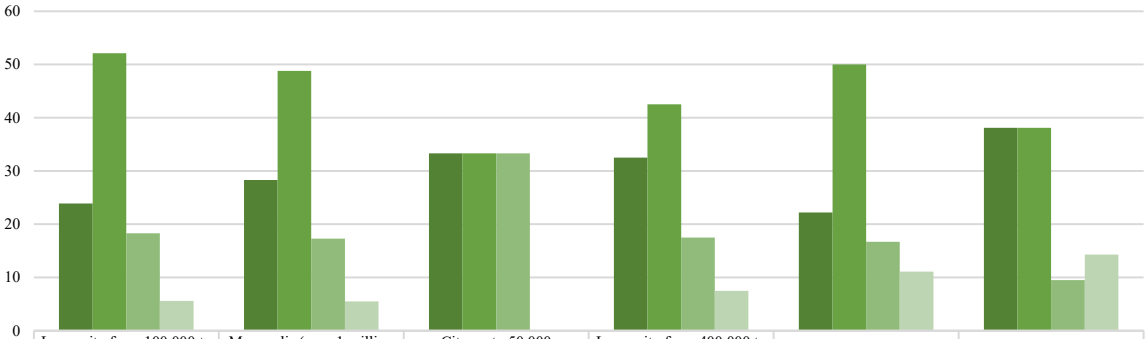
Research has shown that military action forces companies to actively implement digital solutions, as it causes economic and staffing constraints. Given the difficulty of finding personnel, owners are more actively considering replacing their functions with robots, computer programs, etc. Companies that were already digitally advanced were able to adapt quickly, even increasing their level of digitalisation. In some cases, however, the level of digitalisation remained unchanged due to a lack of necessity and reduced demand. However, even in such cases, attempts were made to apply digital technologies, particularly for online trading. Figures 5 and 6 present information on changes in the level of digitalisation of companies' activities during the war.

The survey results indicate that 27% of participating companies have incorporated artificial intelligence technologies into their operations. The vast majority (52%) of respondents have not yet integrated AI into their business activities. Furthermore, it is noteworthy that one-fifth of respondents have expressed intentions to utilise the capabilities of generative artificial intelligence within their professional practice. Notwithstanding the challenges posed by the war, the majority of respondents



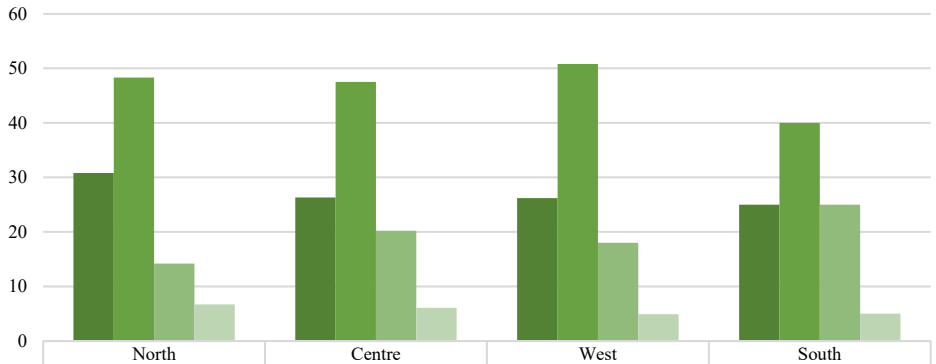

| | North | Centre | West | South |
|---|---|---|---|---|
| fully digitalised | 40,8 | 22,2 | 26,2 | 35 |
| partially digitalised | 42,5 | 60,6 | 49,2 | 50 |
| not digitalised at all | 10 | 12,1 | 18 | 10 |
| difficult to answer | 6,7 | 5,1 | 6,6 | 5 |

**Figure 4. Assessment of the level of digitalisation of a company's activities depending on the region of Ukraine, 2025, %**




| | Large city from 100,000 to 400,000 population | Megapolis (over 1 million population) | City up to 50,000 population | Large city from 400,000 to 1 million population | Village | City 50-100,000 population |
|---|---|---|---|---|---|---|
| increased | 23,9 | 28,3 | 33,3 | 32,5 | 22,2 | 38,1 |
| at the same level | 52,1 | 48,8 | 33,3 | 42,5 | 50 | 38,1 |
| decreased | 18,3 | 17,3 | 33,3 | 17,5 | 16,7 | 9,5 |
| difficult to answer | 5,6 | 5,5 | 0 | 7,5 | 11,1 | 14,3 |

**Figure 5. Change in the level of digitalisation of a company's activities after the start of hostilities, depending on the size of the settlement, 2025, %**




| | North | Centre | West | South |
|---|---|---|---|---|
| increased | 30,8 | 26,3 | 26,2 | 25 |
| at the same level | 48,3 | 47,5 | 50,8 | 40 |
| decreased | 14,2 | 20,2 | 18 | 25 |
| difficult to answer | 6,7 | 6,1 | 4,9 | 5 |

**Figure 6. Change in the level of digitalisation of the company's activities after the start of hostilities, depending on the region of Ukraine, 2025, %**

(71.7%) expressed a high degree of confidence in their region's capacity for economic recovery. This suggests the possibility of continued entrepreneurial endeavours, including the effective integration of digital technologies.

Across all regions, respondents identified the potential for the development of several key industries, with information technology, manufacturing, food and construction, agriculture, logistics and transport being the most frequently cited (Fig. 7).

Ivano-Frankivsk has potential in IT, tourism and food production. Kyiv and the surrounding area are considered to have potential for virtually all industries. Construction, information technology, financial services, education, medicine, trade and agriculture were particularly identified as promising areas. This phenomenon is facilitated by several factors, including the city's status as the capital, its geographical location in the central part of Ukraine, and the high level of digitalisation in the region. For the Kharkiv region, the food, construction, transport, and building materials industries were identified as areas of potential specialisation. The hypothesis that specialisation in the IT sector is probable is unfounded in light of the war and the relocation of companies from the region.

With regard to the potential involvement in regional cluster initiatives (the establishment of specialised clusters, IT parks, industrial parks, and so forth), 36.3% of the surveyed companies expressed a favourable response, while a marginally smaller proportion (27.7%) conveyed a negative stance towards such initiatives. It is noteworthy that 25% of respondents indicated a need for further information on the subject, indicating a significant lack of awareness regarding these issues. Furthermore, awareness of the smart economy, as well as potential smart solutions and

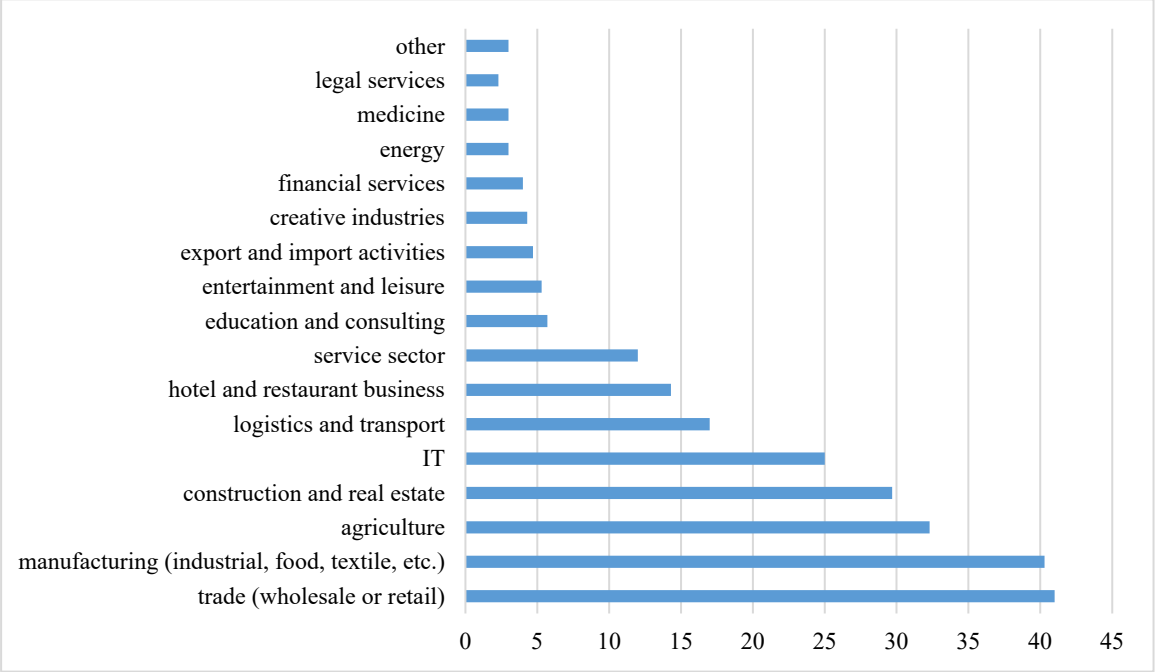



**Figure 7. Industries that could become the region's specialisation, according to survey respondents, 2025, %**

initiatives at the regional level that would be beneficial for business and the local community, is also minimal. However, the survey demonstrated that energy-efficient buildings, intelligent transport systems, and autonomous energy supply systems have the potential to be leaders in such initiatives (Fig. 8).

It is also noteworthy that the study revealed a very low level of involvement of companies in smart solutions. The survey results indicate that almost 80% of the companies are not engaged in smart initiatives within their respective regions. The most severe situation is in the southern regions, where this figure reached 85%. The potential positive impact of integrating technology into urban infrastructure on business is also assessed as moderate. This is clearly related to respondents' lack of information and awareness of these issues. Notably, more than 35% of respondents in the south consider the overall impact to be neutral.

When asked about initiatives that are critical to the economic revival of the regions, respondents cited improvements in infrastructure, particularly transport. These improvements would save time and resources, and open up new cross-border opportunities. Developing educational programmes to train modern specialists could have a significant positive effect. The importance of establishing clusters in key industries was also recognised. However, attracting investors is a key initiative, the importance of which was recognised by the vast majority of respondents (62.3%). For those in the south, this factor is particularly important, with 85% of respondents identifying it as the most crucial factor. Conversely, only 50.1% of respondents from the west of the country identified this factor as pivotal (see Table 1).

In the context of promoting and supporting business, the following tools were identified as important: financial support, including grants from international organisations, various tax incentives, consulting and organisational and technical support, provision of necessary infrastructure, and educational programmes for employees (see Fig. 9).

The necessity for financial assistance was mentioned more frequently in the central region of the country, while educational programmes for employees and infrastructure provision were identified as more pressing concerns in the southern region. Conversely, respondents from the northern region of the country more frequently cited organisational and technical support, as well as consulting assistance.

It is evident that a significant proportion of the surveyed companies, approximately 70%, were not engaged in the implementation of urban development goals. This observation suggests a paucity of business activity in this particular domain. Furthermore, the prospect of business participation in joint sustainable or smart development projects with local or state authorities appears to be a matter of concern, with 85% of respondents reporting an absence of experience in this regard. A comparative analysis of regional representation reveals that the Central region exhibits a higher level of activity, while the South is the least active (see Fig. 10). The development of co-operation between businesses and local or regional authorities

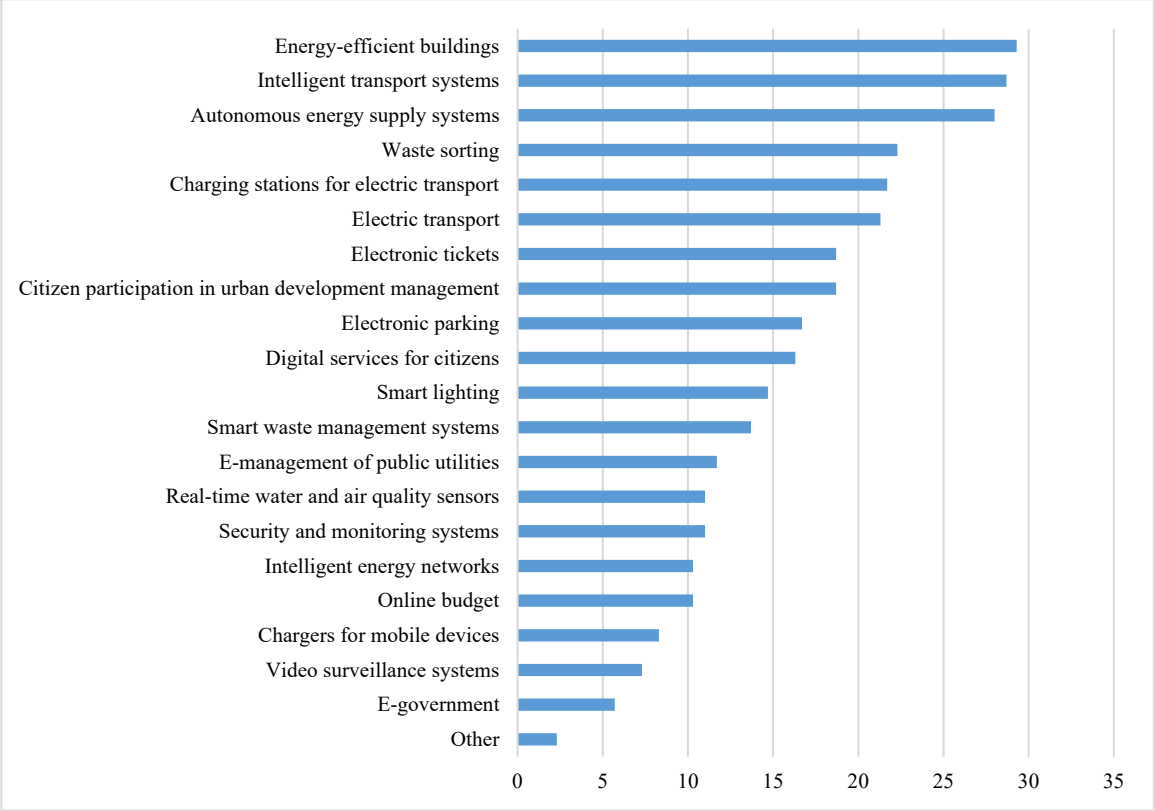



**Figure 8. Smart solutions that would be useful for business and the local community, 2025, %**

Table 1

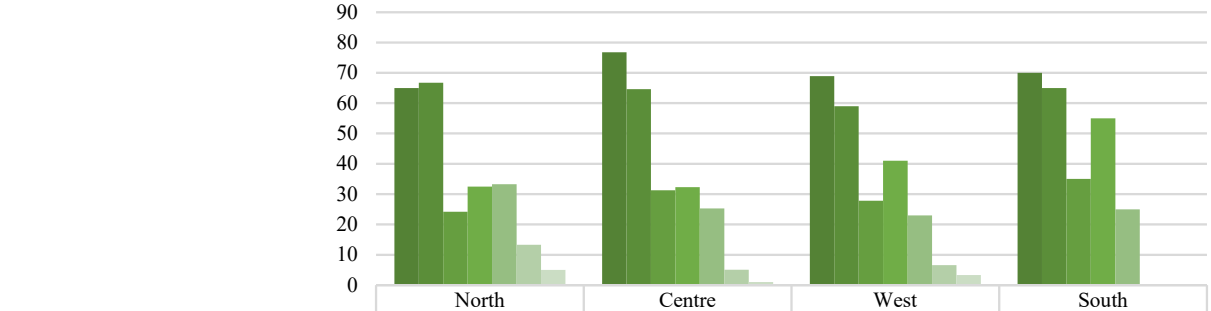
**Initiatives that are most important for the economic revival of the region according to the survey, 2025, %**

| | North | Centre | West | South |
|---|---|---|---|---|
| Attracting investors | 60,8 | 66,7 | 50,8 | 85,0 |
| Improving infrastructure | 55,8 | 57,6 | 63,9 | 75,0 |
| Developing processing industries | 32,5 | 31,3 | 31,3 | 50,0 |
| Development of educational programmes for training specialists | 29,3 | 31,3 | 32,8 | 25,0 |
| Attracting investors | 25,0 | 29,3 | 32,8 | 25,0 |
| Improving infrastructure | 21,7 | 20,2 | 19,7 | 30,0 |
| Developing processing industries | 23,3 | 14,1 | 21,3 | 25,0 |
| Development of educational programmes for training specialists | 16,7 | 19,2 | 13,1 | 10,0 |
| Transport infrastructure | 17,5 | 15,2 | 18,0 | 5,0 |
| Support for local, specific, craft production | 14,2 | 19,2 | 11,5 | 5,0 |
| Development of the food industry | 10,8 | 16,2 | 13,1 | 10,0 |
| Development of recreational areas | 18,3 | 5,1 | 14,8 | 10,0 |
| Other | 3,3 | 5,1 | 0,0 | 0,0 |

is hindered by a number of factors. Among these are corruption, a lack of incentives, and bureaucracy.

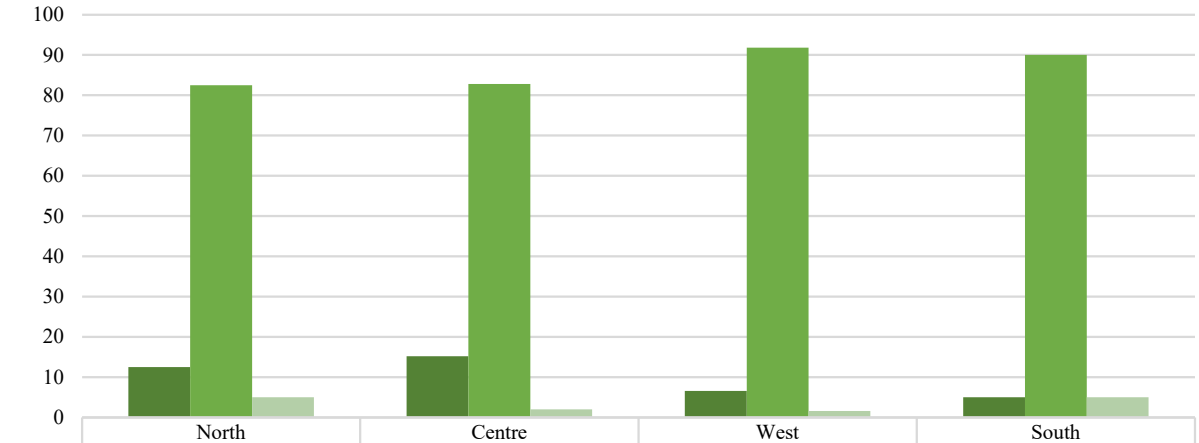
It is noteworthy that in the Southern region, community-led initiatives for sustainable or smart development are predominantly initiated, while in other regions, the primary initiators are predominantly business entities (see Fig. 11).

A significant component in the evolution of a smart ecosystem pertains to the interaction between commercial entities, research institutions and higher education establishments within the region. The survey revealed a marked absence of collaboration between business, science and education in relation to urban development objectives or the execution of




| | North | Centre | West | South |
|---|---|---|---|---|
| financial assistance | 65 | 76,8 | 68,9 | 70 |
| tax incentives | 66,7 | 64,6 | 59 | 65 |
| educational programmes for employees | 24,2 | 31,3 | 27,8 | 35 |
| infrastructure provision | 32,5 | 32,3 | 41 | 55 |
| organisational and technical support | 33,3 | 25,3 | 23 | 25 |
| consulting activities | 13,3 | 5,1 | 6,6 | 0 |
| other | 5 | 1 | 3,3 | 0 |

**Figure 9. Most effective types of business development support according to survey data, 2025, %**



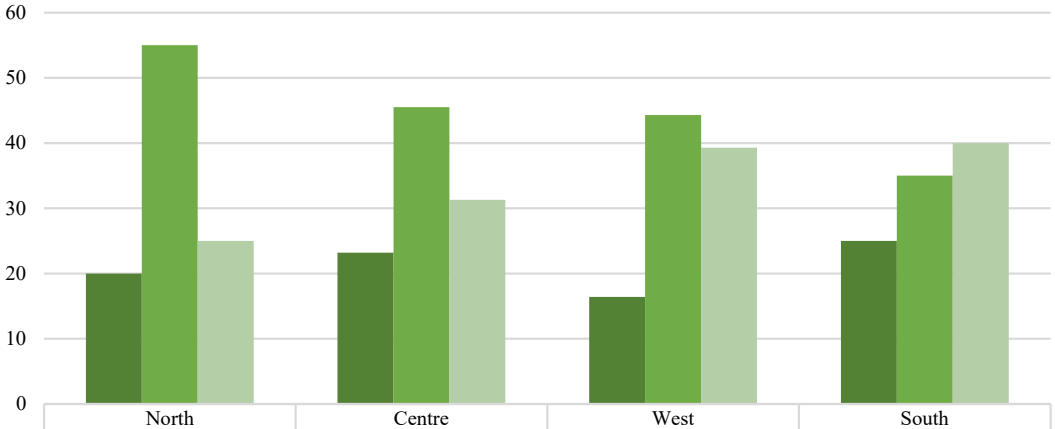

| | North | Centre | West | South |
|---|---|---|---|---|
| yes | 12,5 | 15,2 | 6,6 | 5 |
| no | 82,5 | 82,8 | 91,8 | 90 |
| other | 5 | 2 | 1,6 | 5 |

**Figure 10. Presence of joint projects on sustainable or smart development with local/state authorities according to survey data, 2025, %**

sustainable and intelligent development initiatives. It is evident that businesses are awaiting initiatives from the authorities that will establish the agenda and facilitate the establishment of platforms to engage both the business and education communities in projects that align with urban development objectives.

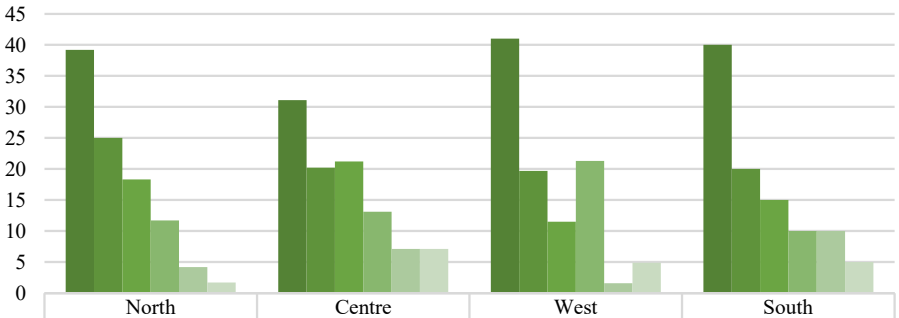
Businesses identify several obstacles to effective co-operation with higher education institutions on sustainable and smart development goals, including bureaucratic barriers, financial constraints and a lack of incentives from local authorities (see Fig. 13).

It can thus be concluded that, in the present circumstances, the focus of business is on survival in the challenging conditions of war. The creation of modern ecosystems geared towards smart development is occurring, albeit slowly. Elements of digitalisation of business activities are spreading, but a number of obstacles are being encountered, in particular due to the lack of affordable software. The commencement of large-scale warfare has resulted in a marked decline in the degree of business digitalisation in the southern regions. This area has experienced the most significant decline in the proportion of enterprises where digitalisation has decreased, while comparatively fewer enterprises have experienced an increase in digitalisation. Representatives from all regions demonstrated a lack of engagement in urban development projects, particularly in the domains of sustainable and smart development. There is a lack of interaction with local authorities within such projects,




| | North | Centre | West | South |
|---|---|---|---|---|
| city authorities | 20 | 23,2 | 16,4 | 25 |
| business | 55 | 45,5 | 44,3 | 35 |
| community | 25 | 31,3 | 39,3 | 40 |

**Figure 11. Initiators of joint projects on sustainable or smart development according to the survey, 2025, %**




| | North | Centre | West | South |
|---|---|---|---|---|
| community | 39,2 | 31,1 | 41 | 40 |
| municipal authorities | 25 | 20,2 | 19,7 | 20 |
| international donors | 18,3 | 21,2 | 11,5 | 15 |
| higher education institutions/research institutions | 11,7 | 13,1 | 21,3 | 10 |
| regional authorities | 4,2 | 7,1 | 1,6 | 10 |
| central government | 1,7 | 7,1 | 4,9 | 5 |

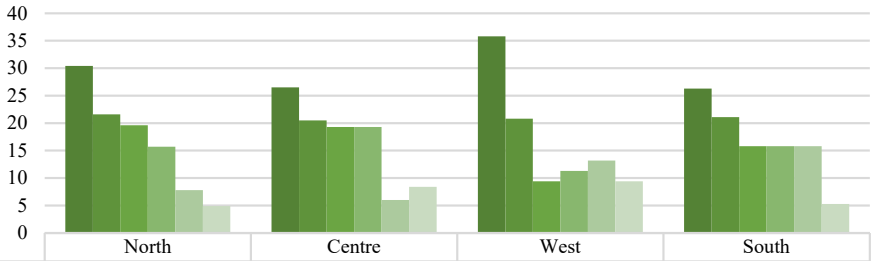
**Figure 12. Initiator of joint projects with HEIs on sustainable or smart development according to the survey, 2025, %**

and a lack of understanding of the prospects for co-operation with higher education institutions on regional smart initiatives.

## 5. Discussion and Research Prospects

It is clear that many institutional and economic-political decisions implemented by Eastern European countries could be effectively adapted for Ukraine, provided they take into account its specific characteristics, such as its wartime experience, fragmented institutional architecture, current level of digitalisation, high IT potential, and the gaps in interaction between Ukrainian businesses, the government and the scientific community. The experience of Poland, Lithuania and the Czech Republic can be used as a reference point. Poland's experience can be used for strategic planning and tax policy for innovation, Lithuania's experience can be used for regulatory policy for fintech and GovTech, and the Czech Republic's experience can be used for the integration of science, business and government into smart clusters. Another opportunity is the prospect of creating regional smart clusters in Ukraine, which could form the basis of a new innovative ecosystem in the country, particularly in the context of post-war reconstruction and decentralisation.

A smart cluster is a network that brings together local businesses (particularly tech companies), universities and research institutes, local authorities and, sometimes, NGOs or community initiatives. The aim is to implement innovative projects in a specific region, such as smart transport, agritech,




| | North | Centre | West | South |
|---|---|---|---|---|
| bureaucratic barriers | 30,4 | 26,5 | 35,8 | 26,3 |
| financial constraints | 21,6 | 20,5 | 20,8 | 21,1 |
| lack of incentives from local authorities | 19,6 | 19,3 | 9,4 | 15,8 |
| lack of incentives for cooperation on the part of higher education institutions | 15,7 | 19,3 | 11,3 | 15,8 |
| inflexibility and obsolescence of the management system in municipal authorities | 7,8 | 6 | 13,2 | 15,8 |
| inflexibility and obsolescence of the management system in higher education institutions | 4,9 | 8,4 | 9,4 | 5,3 |

**Figure 13. Constraints and obstacles to the development of co-operation between business and HEIs on sustainable and smart development, 2025, %**

medtech and green energy. For Ukraine, smart clusters could be a real driver of regional recovery, attracting investment and strengthening the collaboration between science, business and government. Clusters can also be created in response to decentralisation. They provide communities with an effective tool for long-term economic development.

In the prevailing circumstances, the initiation of pilot clusters in multiple regions is a feasible prospect. This would facilitate the acquisition of experience and enable further expansion. It is imperative that the establishment of regional smart clusters is undertaken with the support and involvement of the Ministry of Digital Transformation and the Ministry of Economy, underpinned by the state's commitment to fostering favourable conditions and the active participation of donors. A pivotal component of this initiative pertains to the formulation of a comprehensive vision for smart specialisation, the identification of 'growth points', and the establishment of a suitable digital platform.

## 6. Conclusions

Digitalisation is a pivotal catalyst for regional advancement in Ukraine, engendering the conditions for the establishment of a smart economy, even in traditionally less developed regions of the country. This process assumes particular importance in the context of the current challenges of wartime and the need for post-war recovery. The regions of Ukraine exhibit divergent levels of readiness to implement smart solutions. Western regions, such as Lviv, Ivano-Frankivsk and Ternopil, are showing noticeable progress in the areas of digital services, logistics, education and the development of IT clusters. The Central regions have been identified as having significant potential in the digital transformation of the agricultural sector and industry. Consequently, substantial infrastructure support is required in the Eastern and Southern regions to achieve a digital breakthrough, particularly in the domains of security, energy and manufacturing.

The construction of a smart economy necessitates the consideration of regional particularities, encompassing the resource base, human capital, the degree of digital competence within the population, and the investment attractiveness of specific territories. Public-private partnerships have been identified as playing a pivotal role in this process, with the promotion of the development of IT infrastructure, industrial parks, startups, and educational programmes in the field of digital literacy being a key aspect of this. The global process of digitalisation creates strategic opportunities for Ukraine, in particular with regard to integration into the digital space of the European Union, the attraction of technological investments and the creation of competitive smart regions. In light of the prevailing state of war, the employment of intelligent approaches has become imperative for the effective management of urban infrastructure, the assurance of security, the maintenance of business continuity, and the provision of digital services to the populace.

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