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Contents

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Balkans Journal of Emerging Trends in Social Sciences – Balkans JETSS

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Manuscripts should not exceed 16 pages (450 word per page). This page limit includes all figures, tables, appendices and references.

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Review Paper

Changes in the Innovation Performance of the Visegrad Countries During Their EU Membership

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Abstract: *In 2024, the Visegrad countries – Czechia, Slovakia, Poland, and Hungary – mark 20 years of EU membership. This paper analyses innovation performance trends from 2004 to 2023 using the European Innovation Scoreboard (EIS) framework. The research question investigates whether there is convergence or divergence in innovation performance within the Visegrad Group and between the group and the EU, and in which areas this occurs. The hypothesis assumes no convergence within the group, as strengths and weaknesses remain stable over time. However, EU support has fostered improved innovation performance, suggesting convergence toward the EU average. The practical significance lies in identifying innovation policy gaps and informing decision-makers on how to strengthen regional innovation ecosystems. The findings contribute to designing targeted, effective innovation strategies that can enhance economic performance and competitiveness in the Visegrad region.*

Keywords: *Innovation performance, Visegrad countries, Comparative analysis, European Innovation Scoreboard.*

JEL Classification: O30 · O38 · P16 · F15 · O52 · O57

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1. INTRODUCTION

Czechia, Hungary, Poland, and Slovakia joined the European Union alongside six other countries in 2004. These Central and Eastern European countries are collectively referred to as the Visegrad Group (V4) due to their shared historical and cultural roots. The V4 was established in the early 1990s following the significant economic transformation of these countries, aiming to foster political, economic, and cultural cooperation. The group also sought to coordinate efforts to enhance their chances of achieving common goals, as outlined in the Visegrad Declaration (1991). Despite their shared historical traditions and geographical proximity, the development paths of these countries have diverged. While there are similarities in the development of V4 countries such as the importance of foreign direct investment and export-oriented economies, differences in institutions and factor endowments have resulted in varying economic performances.

Joining the European Union in 2004 provided the V4 countries with an opportunity to accelerate their development. They benefited from significant EU funding, gained access to the EU internal market, made it possible for them to participate in international collaborations, and attracted increased foreign capital inflows due to their EU membership. This created opportunities to enhance competitiveness, modernize the region's economy, and prioritize the development of the innovation ecosystem within the framework of the European Union. This is important because, in the 21st century, innovation has emerged as a key driver of competitiveness and economic growth, making it a crucial factor for the further development of the V4 countries. The science, technology, and innovation policy tools implemented in the V4 countries, following the logic of the linear model of innovation, show a significant degree of similarity (Havas, 2024). Nevertheless, the effectiveness of innovation activities varies across the countries.

It is widely accepted that there is a positive relationship between economic growth and innovation, a connection empirically confirmed by Pece et al. (2015) for CEE countries through multiple regression models. Before joining the EU, both the economic and innovation performance of the V4 countries lagged behind the EU average. Among the Visegrad countries, Czechia is the most developed, partly due to its strong innovation performance and industrial capacity. Poland's economic performance has increased the most during its EU membership; however, its innovation performance remains weak because its innovation system is underdeveloped, preventing the country from fully exploiting the benefits of research and development and innovation (R&D&I). At the time of EU accession, Hungary's economic performance exceeded that of Poland and Slovakia. By 2023, however, Poland had surpassed Hungary, and Slovakia had caught up. While Hungary has improved its innovation capacity, the domestic companies' innovation capacity remains low, with research, development, and innovation primarily tied to international firms. Slovakia's GDP has also grown dynamically since joining the EU; however, the country lags behind in innovation rankings due to weak conditions for fostering innovation.

This research aims to analyse the innovation performance of Visegrad countries during their EU membership period from 2004 to 2023. The study seeks to highlight the main innovation trends, emphasizing the relative strengths and weaknesses of each country. By utilizing the European Innovation Scoreboard, a comparative analysis can be conducted to evaluate the performance of the Visegrad countries across different fields of innovation.

This paper begins by presenting the theoretical background of the research, including statistical insights into the innovation performance of the Visegrad countries, and formulates the research question and hypotheses. It then outlines the measurement framework and methodology used in the study. Finally, the paper summarizes the results of the comparative analysis and draws conclusions about changes in the innovation performance of the Visegrad countries as EU Member States.

2. THE THEORETICAL BACKGROUND OF THE RESEARCH

Innovation performance significantly determines a country's competitiveness and economic growth, as it reflects how effectively a country can exploit the benefits of dynamic technological changes. The innovation activity in the Visegrad Group was quite low before the countries joined the EU. In the context of EU accession, Borsi (2006) analysed the prospects for the V4 countries to catch up and integrate into the European Research Area. By examining R&D indicators, he introduced the concept of the 'Visegrad paradox,' building on the European paradox, as a key constraint to the V4 countries' ability to advance in innovation. This paradox highlights that, despite a relatively high number of researchers compared to Gross Domestic Expenditure on R&D (GERD), Business Expenditure on R&D (BERD), and GDP, the innovation performance of the V4 countries does not align with their scientific output.

Over the past two decades, the Visegrad countries have made significant efforts to improve their innovation systems by leveraging the opportunities provided by EU membership. According to the European Innovation Scoreboard, in 2004, Poland had the weakest innovation performance among EU countries, while Czechia ranked 17th, Hungary 19th, and Slovakia 21st out of 25 EU member states. By 2023, all Visegrad countries had improved their innovation positions. The latest European Innovation Scoreboard indicates that Czechia's innovation performance is now close to the EU average, and Hungary's performance has significantly improved in recent years. Czechia and Hungary, classified as moderate innovators, ranked 14th and 21st, respectively, while Slovakia and Poland, categorized as emerging innovators, ranked 23rd and 24th out of 27 EU countries. According to Prokop et al. (2017), Hungary's innovation system operated efficiently in the first half of the 2010s. The country successfully utilized EU funds, effectively converted innovation inputs into outputs, and Hungarian companies adapted well to external R&D results. In Slovakia, Braha et al. (2015) emphasized that R&D activities remain weakly supported by both public and private funding. The productivity of innovation is low, and there is a limited share of enterprises applying innovation in their business activities. In Poland, no significant improvement in innovation performance has been observed despite its dynamic economic growth. Vukoszavlyev (2019) also observed an improving trend in R&D performance in the V4 countries based on time series indicators. Czechia stands out as the best performer in innovation within the group, though differences persist among the countries, influenced by varying innovation methodologies.

There are significant regional differences in innovation performance not only between the Visegrad countries but also within each of them. The innovation activity concentrated in capital regions, such as Prague in Czechia, Budapest in Hungary, Warsaw in Poland, and Bratislava in Slovakia, because of their advanced infrastructure, higher concentration of skilled labour, and better access to resources required by innovation. Examining the relationship between economic growth and innovation performance at the NUTS III level, Szendi's (2023) analysis revealed a concentration of innovative and economic capacity in metropolitan areas within the V4 group, as well as in the western regions of Czechia and Slovakia. In contrast, the remaining areas of these countries are characterized by low levels of innovation and economic performance. The European Union aims to reduce these regional imbalances by strengthening the innovation potential of underperforming regions. Czupich (2018) highlighted that the highest innovation potential within the Visegrad Group relates to the capital regions of Czechia and Hungary, characterized by high levels of entrepreneurship, advanced education, and increased R&D activity among enterprises. However, Hudec (2015) found that, outside the capital regions, not only Czech but also Polish regions demonstrated efficiency in innovation when measured by R&D expenditures as inputs and patents as outputs. Some years later, Ivanová and Masárová (2018, 2019) evaluated the innovation performance of Visegrad countries' NUTS II regions using the data from the Regional Innovation Index, and they concluded that the highest innovation performance is performed by the regions of Prague and Bratislava, so the capital regions of Czechia and Slovakia.

Several authors have sought to explore the causes of regional disparities in innovation performance. Lux (2020) emphasized that R&D spending in the Visegrad countries is lower than the EU average, which contributes to the lower efficiency of their innovation systems. Using a spatial econometric approach, Wibisono (2023) highlighted the essential role of regional knowledge inputs, such as R&D expenditure and R&D personnel, in fostering innovation in the Visegrad Group. The study emphasized the importance of public sector R&D funding support and the capabilities of R&D personnel in promoting innovation. Hunady et al. (2017), employing panel Granger causality and panel regression analysis, examined the relationship between regional economic development and R&D investment, controlling for the number of R&D employees. They found a strong positive correlation and significant regional disparities in innovation performance. Similarly, Ivanová and Masárová's (2019) detailed analysis revealed that the largest relative differences among Visegrad Group regions are observed in public-private co-publications, international scientific co-publications, SMEs with marketing or organizational innovations, and innovative SMEs collaborating with others. These findings suggest substantial disparities in both the input and output sides of innovation activities. In contrast, the smallest differences were found in exports of medium-high/high-technology intensive manufacturing, most-cited scientific publications, trademark applications, and non-R&D innovation expenditures. Jabłońska (2024) analysed the relationship between specific innovation dimensions and the rate of entrepreneurship in a group of moderate innovator countries – including the Visegrad countries – as classified by the European Innovation Scoreboard for the period 2013–2019. The study found a strong positive correlation between the quality and quantity of entrepreneurial innovations and the entrepreneurship rate in the V4 countries. This implies that pro-innovative activities undertaken by operating enterprises strongly correlate with decisions to start new businesses (Jabłońska, 2024, pp. 7–8). Finally, Ivanová and Masárová (2018) emphasized that persistent and widening regional discrepancies in human capital remain a significant challenge across Visegrad regions.

It can be concluded that significant differences exist within each Visegrad country, primarily due to insufficient human capital, inadequate public and private funding, and low levels of business innovation activity required to drive innovation.

2.1. Statistical Facts About the Innovation Performance of the Visegrad Countries

The strong, positive relationship between a country's innovation and economic performance is supported by Schumpeter (1934/1980), as well as the exogenous and endogenous growth models (Solow, 1956; Romer 1986; Lucas 1988), which emphasize that technological progress enhances economic growth. The new wave of technological progress, driven by digitalization, can accelerate economic growth, as Mhaka and Taonezvi (2024) also point out, provided that countries establish an adequate foundation for development. However, without access to the internet and digital skills, the benefits of digitalization cannot be fully realized within an economy. Over the last two decades, there has been an improvement in both the economic and innovation performance of the Visegrad countries. The COVID-19 pandemic accelerated the diffusion of digital technologies, leading to a rearrangement within the V4 group.

Based on World bank data, the relative economic performance of the Visegrad countries, measured by GDP per capita (PPP, constant 2021 international $) compared to the EU average, ranged from 49.1% to 80.9% in 2004, while in 2023, the range had improved to 72.2% to 91.3%, as reported in the WB (2024). This indicates that the relative performance of all Visegrad countries significantly improved during their EU membership. Specifically, Czechia's performance increased from 80.9% to 91.3%, Hungary's from 62.3% to 74.5%, Poland's from 49.1% to 81.5%, and Slovakia's from 50.6% to 72.2%. Figure 1 illustrates the changes in GDP per capita, PPP (constant 2021 international $) for the V4 countries during their EU membership.

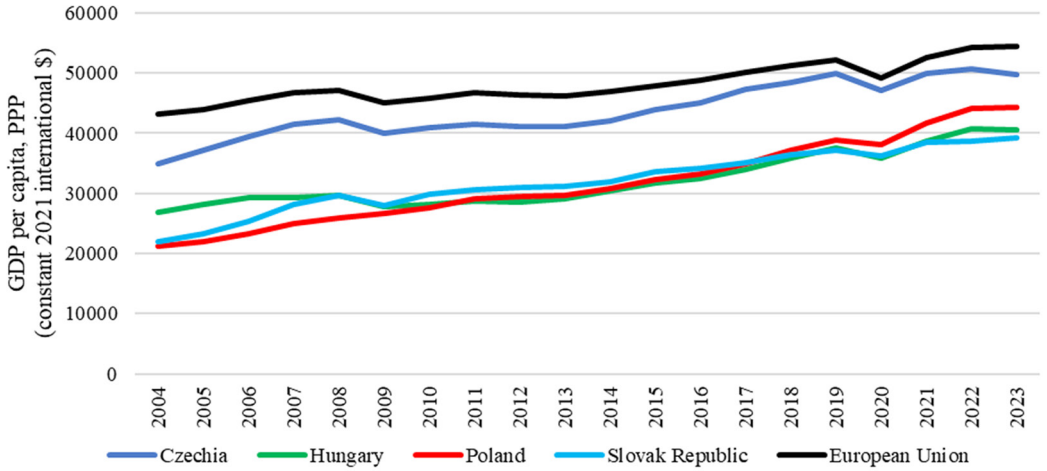

Figure 1. Changes in GDP per capita, PPP (constant 2021 international $) of V4 countries between 2004 and 2023

Source: WB (2024)

Figure 1 illustrates the rearrangement within the V4 group alongside the countries' substantial progress in catching up to the EU average. Poland's economic growth was the most dynamic in the analysed period (3.9% per year on average) and because of this, it overtook both Hungary and Slovakia by 2023. The average growth rate per year was 3.1% in Slovakia, 2.2% in Hungary, and 1,9% in Czechia. The economic development of the V4 countries followed a similar trajectory during the analysed period, achieving economic growth above the EU average; however, the competitiveness and efficiency of their innovation systems lagged behind that of Western European countries. Figure 2 illustrates the World Competitiveness Rankings of Visegrad countries over the last five years.

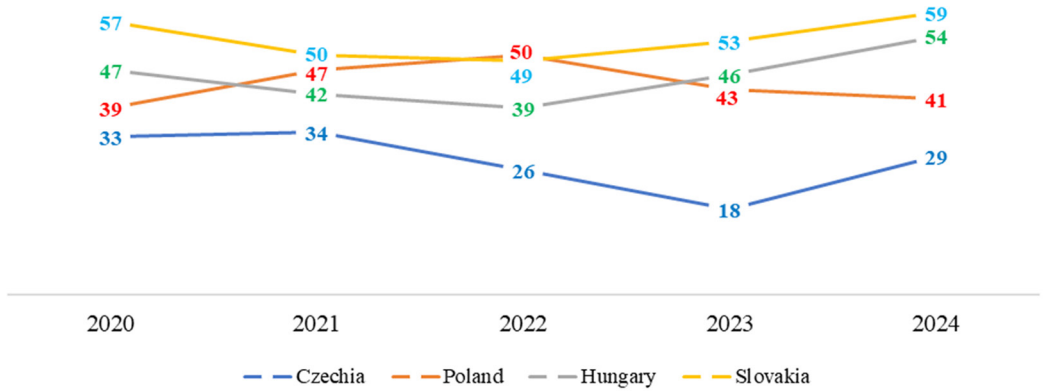

Figure 2. World Competitiveness Rankings of Visegrad Countries, 2020–2024

Source: IMD World Competitiveness Yearbook (2024)

Based on Figure 2, it can be observed that a similar shift in competitiveness occurred within the Visegrad group, as indicated by the change in GDP per capita. Poland's improvement in competitiveness is also noticeable, although it shows greater volatility compared to its economic growth. After a decline following 2020, Poland experienced a significant recovery from the low point of 2022, but it still did not regain its 2020 ranking. Czechia achieved its best ranking in 2023, placing 18th in the competitiveness rankings. Within the EU, only Denmark (the most

competitive country), Ireland, the Netherlands, Sweden, Finland, and Belgium ranked higher. However, Czechia's competitiveness ranking deteriorated significantly by 2024. Hungary's ranking has worsened overall over the past five years. While an improvement was observed up to 2022, its ranking declined afterward. Slovakia remains the least competitive among the V4 countries, following a similar trend to Hungary.

Innovation significantly influences both a country's competitiveness and economic growth. This is confirmed in the Visegrad countries, where the correlation between economic performance, measured by GDP per capita, and innovation performance, measured by the Global Innovation Index, is strong and positive (r=0.738). Ivanová and Čepel (2018) observed that the position of V4 countries in global competitiveness rankings varies depending on their innovation performance. The Global Innovation Index (GII), introduced in 2007, ranked Czechia 32nd, Slovakia 35th, Hungary 36th, and Poland 56th this year. This shows that the innovation performance of the Visegrad countries was relatively similar, with the exception of Poland, which lagged behind (Dutta & Caulkin, 2007). Analyzing the period from 2012 to 2015 using the Global Innovation Index, Corejova and Al Kassiri (2017) concluded that two Visegrad countries (Czechia and Hungary) performed better in innovation output subindexes (such as knowledge and technology outputs, and creative outputs), while the other two (Poland and Slovakia) excelled in innovation input subindexes (including institutions, human capital and research, infrastructure, market, and business sophistication). The authors observed that Hungary's innovative performance deteriorated in both areas, while Poland showed weaker performance in the field of innovation outputs. In contrast, the other countries improved their rankings during this period. According to the latest Global Innovation Index (GII) ranking from 2023, the ranks of Czechia and Hungary have remained relatively stable since 2007. In contrast, Poland's innovation performance has improved, while Slovakia's ranking has declined over this period. Table 1 presents the GII rankings and the main subindices for the Visegrad countries.

Table 1. Rankings of Visegrad countries in the Global Innovation Index 2023

	Czechia	Hungary	Poland	Slovakia
GII rank	31	35	41	45
Output rank	27	33	36	45
Input rank	34	36	50	51

Source: WIPO (2023)

Table 1 shows that in 2023, all Visegrad countries had better rankings for innovation outputs than for innovation inputs, indicating stronger performance in the measurable effectiveness of innovation activities. According to WIPO (2023), Czechia, Hungary, and Slovakia excelled in knowledge and technology outputs, while Poland performed better in creative outputs. Czechia ranked among the best performers in most input categories, such as human capital and research, infrastructure, and business sophistication. Hungary demonstrated strong performance in business sophistication but fell into the second quartile in other input categories. Slovakia performed best in knowledge and technology outputs. In contrast, Czechia, Slovakia, and Poland ranked in the third quartile for market sophistication, indicating weaker performance in this area. Additionally, Poland also ranked in the third quartile for institutions.

Based on statistical evidence, it can be concluded that the innovation performance of the Visegrad countries improved during their EU membership, with each country focusing on different areas in the development of its innovation ecosystem. This led to varying results not only in innovation performance but also in the competitiveness of the V4 countries.

2.2. Research Question and Hypothesis

This paper aims to compare the innovation performance of the Visegrad countries - Czechia, Hungary, Poland, and Slovakia - between 2004 and 2023, using the European Innovation Scoreboard (EIS) to analyse how EU membership has influenced their innovation activity. The research focuses on how the determinants of innovation performance have changed during the period of EU membership in each of the Visegrad countries. *The research question is whether there is convergence or divergence in innovation performance within the Visegrad Group and between the Visegrad Group and the EU, and in which areas this can be observed.* This question is particularly relevant given the strategic importance of innovation in driving economic growth, competitiveness, and regional cohesion in the EU. Understanding the direction and extent of convergence helps evaluate the effectiveness of EU innovation policies and structural support in narrowing the innovation gap between regions. It also sheds light on persistent disparities and structural weaknesses that may require targeted policy interventions.

A significant challenge in the time-series comparison is that the EIS measurement framework has undergone changes over the analysed period, limiting the dimensions of innovation that can be consistently compared over the long term. Consequently, the analysis focuses on the comparison of key drivers of innovation. It is assumed that each country exhibits specific features of innovation that lead to differing innovation capabilities. Additionally, each country has adapted EU funding for innovation development according to its own capacities. As a result, the Visegrad countries have followed unique innovation development paths, leading to variations in their innovation and economic efficiency. *The hypothesis is that there is no convergence within the Visegrad Group, as the strengths and weaknesses remain constant over time.* However, *the overall innovation performance of the V4 countries has improved due to EU support aimed at fostering conditions for innovation. Therefore, the V4 group is converging toward the EU average.*

3. MEASUREMENT FRAMEWORK AND METHODOLOGY

The European Innovation Scoreboard (EIS) provides information across several fields of innovation, making it suitable for analysing the innovation performance of the four Visegrad countries. The EIS facilitates the calculation of the Summary Innovation Index (SII) using a range of indicators, allowing for comparative analysis among European countries. Appendix 1 outlines the changes in its measurement framework between 2004 and 2023. This framework encompasses indicators that reflect the main drivers and outputs of innovation. In 2004, it included only 22 indicators grouped into four categories (*human resources for innovation; the creation of new knowledge; the transmission and application of knowledge; innovation finance, output, and markets*). The EIS 2023 adopts a more detailed approach to innovation, distinguishing four main types of activities - *Framework Conditions, Investments, Innovation Activities, and Impacts* - across 12 innovation dimensions, encompassing a total of 32 indicators.

There are 10 areas for which indicators are available in both versions of the EIS, allowing for a comparison of the Visegrad countries' performance in these fields between 2004 and 2023. These areas include the population with tertiary education, participation in lifelong learning, internet access, public and business R&D expenditures, innovation expenditures, venture capital investments, SMEs' innovation activity, patents, employment impacts, and sales impacts. While the indicators remain similar, some changes in measurement have been introduced to improve the comparability of innovation performance across European countries. In the 2004 version of the EIS, key areas missing from the framework included publication activity, sustainability, other forms of intellectual property beyond patents, and the use of information technology. To compare the innovation performance of the Visegrad countries, descriptive statistics were primarily utilized.

4. EMPIRICAL RESULTS

As a first step in the analysis, the changes in the overall innovation performance of the Visegrad countries during their EU membership are compared. At the time of joining the EU, all countries were classified among the lowest-performing innovation groups. However, by 2023, Czechia had approached the EU average, and the performance of the other countries had also improved significantly.

As Figure 3 illustrates, there was a significant improvement in innovation performance across all Visegrad countries. However, when analysing the relative performance of the V4 countries using the Summary Innovation Index (SII), no substantial change is observed in Hungary's and Slovakia's innovation performance relative to the EU average. In contrast, Czechia and Poland demonstrated convergence toward better-performing countries. Czechia's SII was 75% of the EU average in 2004, but during its EU membership, its innovation performance improved significantly, reaching 94.7% of the EU average by 2023. Poland, which was the worst-performing country in 2004 with an SII of 38.9% of the EU average, also saw substantial improvement, achieving 65.6% of the EU average in 2023. Despite these changes, the innovation ranking of the V4 countries remained consistent throughout their EU membership, with Czechia being the top performer, followed by Hungary, Slovakia, and Poland. It is interesting that Poland surpasses both Hungary and Slovakia in terms of economic performance and competitiveness, yet it lags behind them in the comprehensive assessment of innovation performance, indicating a slower convergence in the field of innovation. Because of this, when using the EIS framework to compare innovation performance of Visegrad countries, no rearrangement within the V4 group was observed between 2004 and 2023.

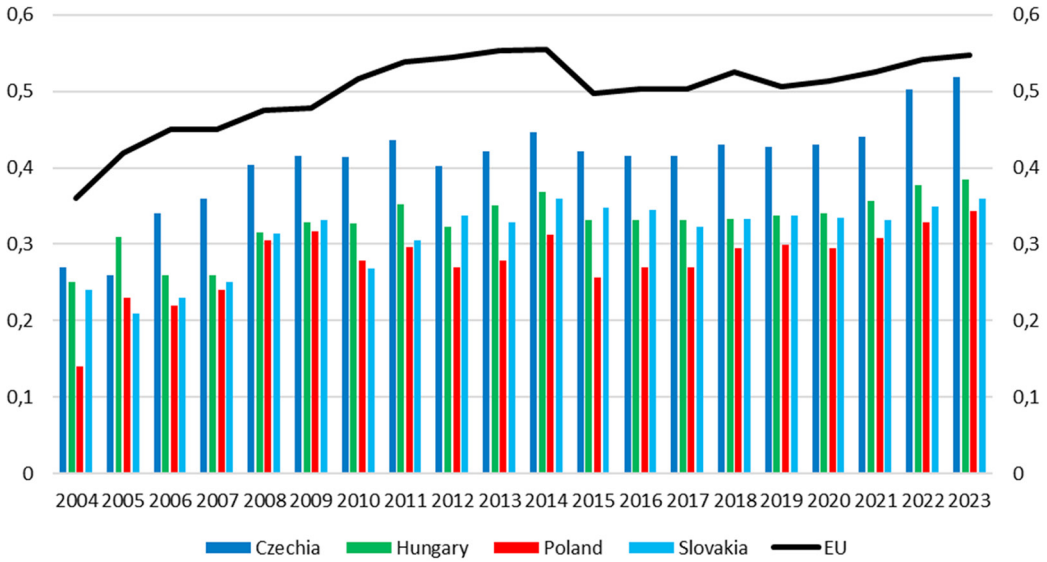

Figure 3. Changes in the Summary Innovation Index of Visegrad Countries and their relative performance compared to the EU average (2004–2023)
Source: Own construction based on EC (2004-2023).

In the next step of the analysis, the different fields of innovation were compared for the year when the countries joined the EU. Table 2 presents a comparison of the relative strengths (indicating indicators that are above or close to the EU average) and relative weaknesses (indicating the lowest relative performance) of the V4 countries, based on the main drivers and outputs of innovation as measured by the indicators in the 2004 EIS.

Table 2. Relative strengths and weaknesses in innovation among Visegrad Countries in 2004

Country	CZECHIA	HUNGARY	POLAND	SLOVAKIA
Innovation performance group	Moderate innovators *75.0%*	Moderate innovators *69.4%*	Moderate innovators *38.9%*	Moderate innovators *66.67%*
	of the EU average			
Relative strengths	Employment in medium/high-tech manufacturing			Employment in medium/high-tech manufacturing
	Sales 'new-to-market' products	SMEs involved in innovation cooperation		Innovation expenditures
	ICT expenditures			
		High-tech manufacturing value-added share		Sales new-to-market products
Relative weaknesses	S&E graduates		Business R&D expenditures	
	EPO and UPSTO high-tech patents and all EPO and UPSTO patents			
	High-tech and early-stage venture capital			Early-stage venture capital
			High-tech manufacturing value-added share	SMEs innovating in-house and involved in innovation cooperation

Source: Own construction based on EC (2005).

At the beginning of the analysed period, the common strengths of the V4 countries were ICT expenditures and the employment impact of innovation, as measured by employment in medium- and high-tech manufacturing (with a missing value for Poland). It can be concluded that in 2004, the relative strengths of the V4 countries were primarily in the dimensions of innovation finance, outputs, and markets. In contrast, their relative weaknesses were associated with risky financing, human resources, business innovation activity, and intellectual assets, reflecting deficiencies on the input side or drivers of innovation. Venture capital, which is critical for financing risky innovative projects, was particularly low in the V4 countries. Additionally, patenting activity was also limited, closely tied to the relatively low levels of business innovation activity.

The EU has made substantial investments to enhance the innovation ecosystems in its member states and has established the Innovation Union. Between 2004 and 2023, the EIS measurement framework underwent significant changes, allowing for a more detailed analysis of innovation performance. All V4 countries showed improvement in participation in lifelong learning, which became one of Slovakia's relative strengths in 2023 (108.8% of the EU average). The proportion of the population with tertiary education increased in Slovakia and Poland, where the rates were notably low in 2004. However, there was a decline in Hungary and stable relative performance in Czechia in this area of human conditions, as this remained a relative weakness for these countries. R&D expenditures increased in all V4 countries, primarily driven by the business sector, with enterprises showing higher levels of innovation activity. Venture capital expenditures rose in Czechia, Hungary, and Poland, but it remained one of Slovakia's relative weaknesses. The employment impacts of innovation continued to be strong in Czechia, exceeding the EU average. At the same time, a decline was observed in the other V4 countries, whose relative performance dropped to 50–60% of the EU average. Intellectual assets, however, remained a persistent weakness across all countries.

In 2023, Czechia and Hungary were classified as Moderate Innovators, with Czechia's relative performance exceeding the group average (94.7%), while Hungary ranked the lowest within this

group (70.4%). Slovakia and Poland were categorized as Emerging Innovators, with both countries' innovation performance surpassing the group average (65.6% for Slovakia and 62.8% for Poland). Figure 4 provides a comparison of the V4 countries across the 12 innovation dimensions.

Figure 4 illustrates that the V4 countries differ significantly across most fields of innovation. Czechia has a notable advantage in firm investments, innovation activities (as measured by SMEs' product and business process innovations), and employment effects. Slovakia and Poland lagged behind Czechia and Hungary in most areas, particularly in attractive research systems, finance and support, sales impacts, and environmental sustainability. Slovakia performs best in human resources, thanks to its above-average participation in lifelong learning, and is comparable to Czechia in sales impacts. However, it falls significantly behind in finance and support, as well as in linkages. Poland stands out in digitalization, with the highest broadband penetration in the V4 group. This could enable Poland to catch up in both competitiveness and economic growth. It also has a substantial advantage in intellectual assets, driven by design applications, which were 150.5% of the EU average. Nevertheless, Poland lags in sales impacts, environmental sustainability, attractive research systems, and employment impacts. Hungary's innovation performance is comparable to Czechia's in areas such as attractive research systems, digitalization, finance and support, and linkages. However, it shows the weakest performance in intellectual assets and human resources. By analyzing which factors significantly determine the overall innovation performance in these countries, it can be concluded that employment effects (r=0.997), innovators (r=0.987), and firm investments (r=0.984) show a very strong correlation with the SII. In these areas, Czechia performs well. However, there is only a slight effect of digitalization (r=0.133) and human resources (r=0.337) on innovation performance, where Poland and Slovakia excel. This is because these countries are lagging behind.

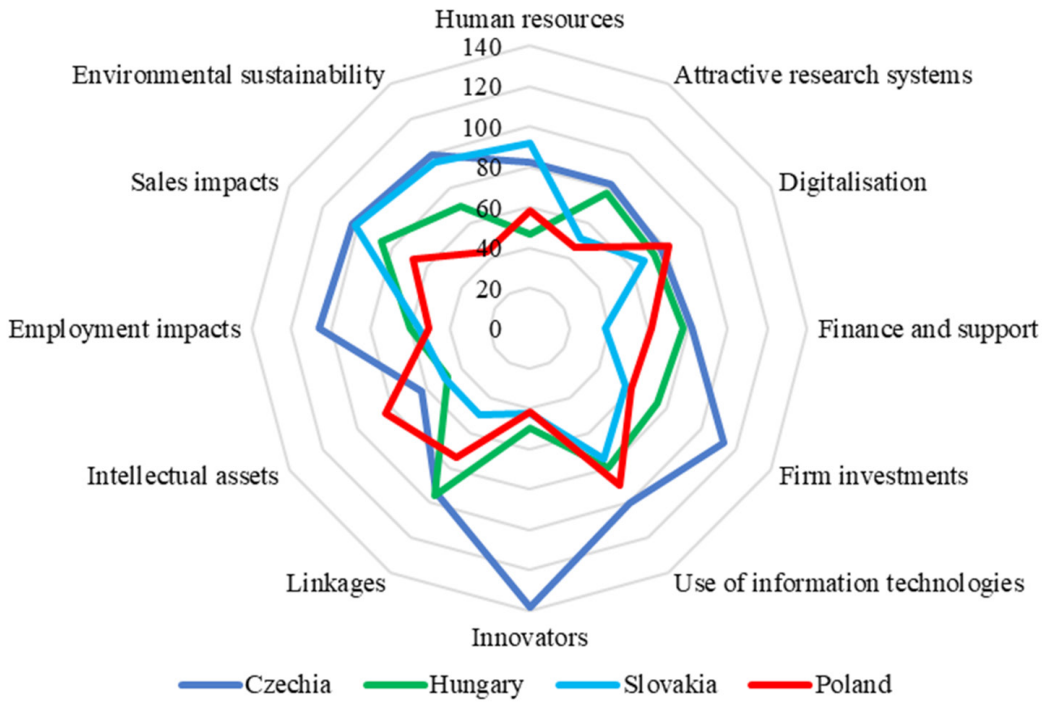

Figure 4. The comparison of Visegrad countries in the innovation dimensions of EIS 2023
Source: Own construction based on EC (2023).

Table 3 highlights the relative strengths and weaknesses of the V4 countries based on the EIS 2023. Czechia's performance exceeded the EU average in several areas, including doctorate graduates, international scientific co-publications, foreign doctorate students, innovation expenditures per employee, enterprises providing ICT training, employment in innovative enterprises, medium and high-tech goods exports, sales of innovative products, and air emissions by fine particulate matter. This indicates that Czechia lagged behind the EU average primarily in intellectual assets, digitalization, and finance and support.

Table 3. Relative strengths and weaknesses in innovation among Visegrad Countries in 2023

Country	CZECHIA	HUNGARY	POLAND	SLOVAKIA
Innovation performance group	Moderate innovators		Emerging innovators	
	94.7%	*70,4%*	*62.8%*	*65.6%*
	of the EU average			
Relative strengths	Non-R&D Innovation expenditures	Foreign doctoral students	Enterprises providing ICT training	Lifelong learning
	Business process innovators	Government support for business R&D	Design applications	Sales of innovative products
	Product innovators	Medium and high-tech goods exports	Trademark applications	Medium and high-tech goods exports
	Innovative SMEs collaborating with others		Population with tertiary education	Air emissions by fine particulate matter
	Public-private co-publications			Non-R&D Innovation expenditures
		Job-to-job mobility of HRST		
Relative weaknesses	Most cited publications	Business process innovators		R&D expenditure in the business sector
	PCT patent applications	Design applications	PCT patent applications	
	Population with tertiary education		Environment-related technologies	Venture capital expenditures
	Job-to-job mobility of HRST	Doctorate graduates		Job-to-job mobility of HRST
	Government support for business R&D	Employment in innovative enterprises	Innovation expenditures per employee	Government support for business R&D

Source: Own construction based on EC (2023).

According to the country analysis in the European Innovation Scoreboard 2023, there was a significant increase in SMEs' innovation activity and venture capital investments in Czechia. Hungary showed improvements in the human conditions for R&D activity, including foreign doctorate students, job-to-job mobility of HRST (Human Resources in Science and Technology), and publication activity. Slovakia made progress in lifelong learning and publications, while Poland experienced a notable rise in innovation activity within the business sector in recent years. In contrast, a decline was observed in finance and support in both Czechia and Hungary, as well as in environment-related technology in Poland and Slovakia.

Analysing recent trends, the EIS 2023 concluded that the performance gap between Slovakia and Hungary and the EU average is widening, whereas this gap is narrowing for Czechia and Poland (EC, 2023). In the year of joining the EU, Poland's relative performance compared to the EU average was 38.9%, but the country has improved significantly, reaching 62.8% by 2023. There has been a significant improvement in education and ICT infrastructure related to the R&D&I,

creating the basis of innovation activity. However, the innovation capability of Polish enterprises remains low. Czechia has shown moderate improvement in innovation performance, starting from 75% and has almost reached the EU average by 2023, with a relative performance of 94.7%. The innovation activity of the Czech industrial sector is traditionally strong, with innovative enterprises ensuring high-level innovation performance, sound employment effects, and favourable financing possibilities. The strengths of innovation in Czechia are closely related to the business sector, where the circumstances favour innovation.

In contrast, Hungary's relative performance has remained almost constant (69.4% in 2004 and 70.4% in 2023), while Slovakia's relative performance worsened, falling from 66.7% to 65.6% of the EU average. The weaknesses of Hungary are related to the human resource conditions for innovation and the low innovation capability of Hungarian SMEs. The improvement is mainly linked to marginal areas of innovation, with no significant development in critical fields, particularly in business innovation activity and human resources. Slovakia's relative innovation performance had worsened by 2023 within the V4 group. While the human resource conditions, supported by lifelong learning programs, and the employment and sales impacts of innovation are favourable, the innovation activity in the business sector remains low, and there is no effective research system to enable innovation in the country. These statements are consistent with Hanáčková and Takáč (2024), whose TOPSIS analysis identifies several barriers to innovation within the V4, such as the lack of financial resources for innovative activities, especially in the private sector, the high costs associated with innovation, and difficulties in accessing state or grant funding.

In the final step of the analysis, the R&D expenditures were analysed because some authors emphasized the problem with insufficient financing as a constraint of efficient innovation. Ivanová and Žárská (2023) pointed out that there is a positive correlation between R&D expenditures and the aggregate innovation index in all V4 countries. Figure 5 shows the evolution of gross domestic expenditure, business enterprise expenditure, and higher education expenditure on R&D as a percentage of GDP in 2004 and 2022.

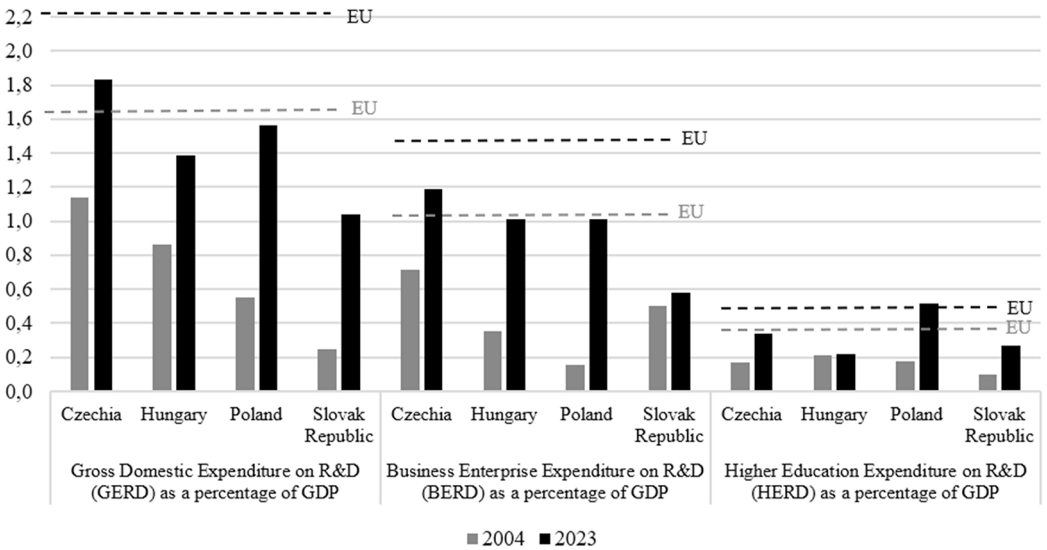

Figure 5. The evolution of R&D expenditures in the Visegrad Countries and the EU average in 2004 and 2023

Source: Own construction based on OECD (2024) and Eurostat (2024)

Figure 5 illustrates that in 2004, all Visegrad countries significantly lagged behind the EU average in almost all forms of R&D expenditures. By 2023, Czechia exceeded the 2004 levels of GERD and BERD, but still did not reach the EU average. Poland has shown significant improvement in all expenditure areas, with HERD surpassing the EU average in 2023. Analysing R&D expenditures reveals that by 2023, Czechia has moved closer to the EU average in GERD and BERD, though a gap remains in HERD, where it has almost reached the 2004 EU average. In Hungary, the share of business R&D expenditures (BERD) significantly increased from 0.35% to 1.01%, but HERD stagnated at the 2004 level. While GERD also grew, Poland surpassed Hungary in both GERD and BERD, with BERD levels being the same in 2023. Both Poland and Slovakia substantially increased their R&D expenditure ratios, with Poland's GERD rising from 0.55% to 1.56%, and Slovakia's from 0.5% to 1.04%. In Slovakia, R&D expenditures grew primarily in higher education, with modest growth in business expenditures during the analysed period. Despite these improvements, the EU's 3% R&D expenditure target remained unmet, with the EU average standing at only 2.11% in 2022.

Analysing the relationship between factors related to innovation performance, it can be concluded that there is a strong positive correlation between the SII and GERD, as well as between SII and BERD ($r=0.827$ and $r=0.755$), which indicates that better financing generates more innovation. In the case of SII and HERD, there is a weak negative correlation ($r=-0.037$), which shows that higher education expenditures alone do not promote innovation performance effectively, as indicated by Poland.

5. CONCLUSION

The year 2024 marks 20 years of European Union membership for Czechia, Hungary, Slovakia, and Poland, collectively referred to as the Visegrad countries. This analysis focuses on the changes in their innovation performance, which is a key driver of economic growth and competitiveness. The research question was whether there is convergence or divergence in innovation performance within the Visegrad Group and between the Visegrad Group and the EU, and in which areas this can be observed. According to statistical data, the innovation performance of the Visegrad countries has improved significantly during their EU membership, partly due to the various forms of support aimed at enhancing innovation efficiency as previously hypothesized. The Summary Innovation Index (SII), which measures overall innovation performance, showed improvement during the period of EU membership. However, the relative position of these countries compared to the EU average has not changed significantly. In 2023, Poland was no longer the lowest-ranked country in the innovation rankings but remained in the worst-performing group, referred to as Emerging Innovators, alongside Slovakia. Czechia was near the EU average, and Hungary made rapid progress, joining the Moderate Innovators group.

It can be concluded that convergence within the V4 group has been observed in areas such as digitalization and the use of information technologies. It was not previously assumed. However, Czechia, as the best-performing country in the group, maintains a significant advantage in firm investments, innovation activities, and employment effects. Slovakia excelled in lifelong learning, Hungary led in linkages, and Poland stood out in design applications and broadband penetration.

Innovation is a critical factor for achieving high economic growth and competitiveness, prompting the Visegrad countries to focus on enhancing their innovation capabilities. However, conducting time-series analysis in the field of innovation is challenging due to frequent changes in measurement frameworks. The European Innovation Scoreboard provides a useful tool for comparing countries' performance in key innovation areas, allowing for conclusions about long-term trends. In the future, it would be worthwhile to compare V4 countries using other innovation measurement frameworks, stepping beyond the European context.

A more detailed analysis of specific innovation subfields could provide further insights into how the differing innovation ecosystems of countries with similar traditions and support systems can be effective. Consequently, EU membership has created a favourable environment for innovation development in the Visegrad countries, with significant financial support, opportunities for scientific cooperation, and innovation-promoting regulations and strategies. However, the extent of utilization and the results achieved vary among the individual countries. The Visegrad countries should focus more on addressing their weaknesses and capitalizing on their strengths to fully realize the region's innovation potential.

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Appendix 1
Changes in the measurement framework between 2004 and 2023

	SUMMARY INNOVATION INDEX 2023		SUMMARY INNOVATION INDEX 2004
Main types of activities	**Innovation dimension**	**Indicator**	**Indicator**
FRAMEWORK CONDITIONS	Human resources	New doctoral graduates (in STEM)	S & E graduates/ 20-29 years
		Population aged 25-34 with a tertiary education	Population with tertiary education
		Lifelong learning	Participation in lifelong learning
	Attractive research systems	International scientific co-publications	
		Top 10% most cited publications	
		Foreign doctoral students	
	Digitalisation	Broadband penetration	Composite indicator on Internet access
		Individuals who have above basic overall digital skills	
INVESTMENTS	Finance and support	R&D expenditure in the public sector	Public R&D/GDP
		Venture capital expenditures	High-tech venture capital share Early-stage venture capital/GDP
		Direct government funding and government tax support for business R&D	
	Firm investments	R&D expenditure in the business sector	Business R&D/GDP
		Non-R&D innovation expenditures	ICT expenditures/GDP
		Innovation expenditures per person employed in innovation-active enterprises	Innovation expenditures/turnover
	Use of information technologies	Enterprises providing training to develop or upgrade the ICT skills of their personnel	
		Employed ICT specialists	
INNOVATION ACTIVITIES	Innovators	SMEs with product innovations	SMEs innovating in-house
		SMEs with business process innovations	SMEs being non-technical innovators
	Linkages	Innovative SMEs collaborating with others	SMEs involved in innovation cooperation
		Public-private co-publications	
		Job-to-job mobility of Human Resources in Science & Technology	
	Intellectual assets	PCT patent applications	High-tech EPO & USPTO patents/population EPO & USPTO patents/population
		Trademark applications	
		Design applications	
IMPACTS	Employment impacts	Employment in knowledge-intensive activities	Employment in medium/high-tech manufacturing
		Employment in innovative enterprises	Employment in high-tech services
	Sales impacts	Medium and high-tech product exports	High-tech manufacturing value-added share
		Knowledge-intensive services exports	
		Sales of product innovations	Sales 'new-to-market' products/turnover Sales 'new to firm' products/turnover
	Environmental sustainability	Resource productivity	
		Air emissions by fine particulates PM2.5 in the industry	
		Development of environment-related technologies	

Source: EC (2005) and EC (2023)

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Original Scientific Article

Exploring Sustainable Agritourism and Emerging Technologies in Society 5.0

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Abstract: *As society continues to evolve, so does our relationship with the environment, technology, and the way we engage with our surroundings. The concept of Society 5.0 envisions a harmonious fusion of technology and human-centric solutions to address societal challenges. This paper explores the transformative role of emerging technologies in sustainable agritourism. This exploration highlights the symbiotic relationship between technological innovation and sustainable agritourism, presenting a forward-looking view of how these intertwined elements can shape the future fabric of Society 5.0. The study presents a comprehensive overview of the transformative potential of sustainable agritourism in the context of Society 5.0, offering insights into the future of responsible and technology-driven rural tourism. The convergence of sustainable agritourism and emerging technologies within the context of Society 5.0 represents a promising path toward a more sustainable and technologically enriched future.*

Keywords: *Society 5.0, Sustainable, Emerging technologies, Agritourism.*

JEL Classification: Q01 · Q13 · O33 · L83 · L97

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1. INTRODUCTION

Since the beginning of the 21st century, humanity has been undergoing complex innovative transformations that activate the era transition to a new socio-economic process. Thus, the development of human civilization is related to the constantly changing economic formations, and the current social and economic situation is determined by concepts such as Society 5.0 and the fourth and fifth industrial revolutions (Melnyk, L.H. et al., 2019). The global landscape has entered a transformative era marked by the sweeping forces of globalization and the swift advancement of digital technologies. Disruptive technologies, like the Internet of Things (IoT), Big Data (BD), Artificial Intelligence (AI), robotics, 3D printing, Cloud Computing (CC), Mobile Devices (MD), and others, are propelling substantial shifts in both business and society. This dynamic interplay is forging an entirely novel environment, heralding significant changes and opportunities on a profound scale. Strategies for industrial modernization should prioritize placing people and the societal needs at the forefront.

Society 5.0 defines a system of systems (such as energy management and road transport systems, among others) that connect to the Internet for the mitigation of both local and global social problems (such as the reduction of carbon emissions). This new concept of society aims to focus on the human to balance the deployment of Big Data Technologies, the Internet of Things, and Artificial Intelligence with the resolution of major problems of society such as: competitiveness, productivity, connection and wellbeing, all these on the basis of achieving the maximization of human use of the ongoing technological transformation, digitization (Narváez Rojas et al., 2021).

Recently discussed concept of Society 5.0 (S5.0) and Industry 5.0 (I5.0) (Carayannis, 2021; Carayannis & Morawska-Jancelewicz, 2021; Breque et al., 2021; Fukuyama, 2018) highlights the need to rethink existing working methods and approaches towards innovation and to focus them on developing human-oriented solutions and social innovation (Morawska-Jancelewicz, 2022). While Society 5.0 is a broad concept focusing on the integration of digital technologies to address societal challenges, it can be applied in various sectors, including agritourism. Agritourism involves the intersection of agriculture and tourism, providing visitors with authentic agricultural experiences. Society 5.0 and Industry 5.0 both reflect fundamental shifts of societies and economies towards a new paradigm to balance economic development with the resolution of social and environmental problems and to tackle challenges associated with human–machine interactions and skills matching (Breque et al., 2021). In this new paradigm, the importance of knowledge is not determined exclusively by competitiveness and productivity, but by taking into account the creation of social well-being, the impact on the quality of life, and co-creation of knowledge as part of public–private partnerships (Morawska-Jancelewicz, 2022, p. 3). If industry should become the provider of true prosperity, the definition of its true purpose must include social, environmental, and societal considerations (Breque et al., 2021, p. 15). It also stresses that even the most advanced technology should not be above humanity (Sułkowski et al., 2021).

What prompts the decision to embrace the trajectory of Society 5.0? This choice is driven by the distinct attributes of agritourism, which is intricately linked to a community defined by its norms, values, beliefs, and expectations for heightened well-being. This community stands to gain from the human-centred societal approach. Agritourism materializes through the active participation of the community, ultimately serving its well-being. The paper delves into the integration of technology and examines how it is perceived in relation to sustainability. *Society 5.0 is a kind of bond between changes taking place in the technology, digital, and information flow areas and focuses its activities on the concept of sustainable development of societies* (Sułkowski et al., 2021, p. 4).

In other words, the vision of Society 5.0 requires us to think about two kinds of relationships: the relationship between technology and society and the technology-mediated relationship between individuals and society (Society 5.0: A people-centric super-smart society, 2018, p. 5).

Through this study, we aim to shed light on the challenges and opportunities faced by agritourism pensions in embracing technology. The insights gained will not only contribute to the existing knowledge base but also provide valuable recommendations for stakeholders, including pension owners, local authorities, and technology providers.

The Tourbit project (2022) was selected as a reference framework due to its alignment with EU strategies promoting digitalization in tourism SMEs. The project's Digital Readiness Index, developed by Arctur d.o.o., serves as a validated online tool for evaluating the maturity of digital adoption across multiple dimensions such as infrastructure, marketing, operations, and innovation. Its structured metrics provided a relevant benchmark to assess the digital capabilities of agritourism businesses in this study.

2. MATERIALS AND METHODS

The primary aim of this study is to unravel the layers of technology usage, examining the challenges faced and opportunities seized by agritourism pensions in embracing digital advancements. This study analyzes the current digital readiness level using two main areas: technology usage and capacity of the organisation in 50 agritourism pensions, but only 25 answered all the questions completely. For our analysis we use Tourbit project (2022). Digital readiness index (Software by Arctur d.o.o.) [Online tool]. The core of the Digital Readiness Index (DRI) is based on a multi-attribute decision-making (MADM) methodology that allows evaluation, analysis, and comparison of individual tourism SMEs. In Table 1 are presented the three main topics for technology usage and capacity of the organization from different questions concerning digital tools and the organizational culture.

Table 1. Main topics from different questions for the digitalization level

Technology usage	**Capacity of the organisation**:
Internal operations/management • Technologies for internal management • The digital workplace • Cloud computing • Blockchain • Internet of Things (IoT) • Cybersecurity • Data analytics	**Informatics policy** • Digitalization strategy • Data management • Share of investment
Customer management • Social media • Technologies for relations with customers • Mobile business for customers • Digital channels • Customer acquisition	**General strategy** • Education and training • Key personnel management • Digital competences • Agility • Method of management • Method of decision making • Propensity to take risk
Product/service development • Value proposition • Relations with suppliers and partners • Revenue/costs • Virtual Reality (AR and VR)	**Organizational culture** • Informatics • Engagement • Accepting changes • Employee autonomy • Open communication

Source: Own research

After that it will be positioned like: beginner, intermediate, proficient, expert. The second dimension is capacity of the organization, aggregated results of all questions present in the tool's Capacity of the organisation section. It integrates the results of different questions concerning the organisational culture and the readiness of the company to take steps towards digitalisation. It is comprised of 3 main topics: informatics policy, general strategy, and organisational culture. By the end, we have a conclusion such as 'not yet ready,' 'promising,' 'in the process,' or 'front-runner.'

In the study, we also used an exploratory qualitative research based on interviews to evaluate the opinion of entrepreneurs regarding the positive and negative effects of digitalisation in agritourism on three levels: economic, social, and environmental.

The study employed purposeful sampling, targeting owners and managers of agritourism businesses in Gorj County, Romania. A total of 25 participants were selected based on their active involvement in tourism-related rural activities and their willingness to engage in discussions about digitalization. This sample size was considered adequate for an exploratory case study aiming to gather both quantitative and qualitative insights.

The use of the Digital Readiness Index developed within the Tourbit Project (2022) was chosen due to its structured evaluation framework specifically designed for tourism SMEs. This tool enabled the identification of digital maturity levels across multiple dimensions such as infrastructure, marketing, and operations. Its standardized indicators provided a reliable basis for comparing results across respondents.

Complementing the questionnaire, semi-structured interviews were conducted to gather deeper, context-rich information. This qualitative method was selected to allow participants to express their experiences, perceptions, and expectations regarding digital transformation—adding interpretive depth to the structured survey findings.

Quantitative data were processed using descriptive statistical methods (mean, frequency, and percentage analysis), while qualitative responses were analysed thematically, combining deductive coding based on research questions and inductive coding to capture emerging patterns. This methodological triangulation enhances the validity and credibility of the results. The structured questionnaire used in this study was adapted from the **Digital Readiness Index** developed within the *Tourbit Project (2022),* an EU initiative aimed at supporting digital transformation in tourism SMEs. The questionnaire consisted of both closed-ended and open-ended questions, targeting four key dimensions:

1. Current use of digital tools,
2. Perceived benefits of digitalization,
3. Barriers to adoption,
4. Support needs for digital transformation.

We used an interview guide, and the answers were formulated on a 5-point scale, ranging from strongly disagree to strongly agree.

The research objectives guiding this study are:

1. To assess the level of digital readiness among agritourism stakeholders.
2. To explore the perceived benefits and barriers to digitalization in agritourism.
3. To identify support needs for digital transformation in line with Society 5.0 principles.

These objectives are addressed through a mixed-methods approach, combining quantitative assessment using the Digital Readiness Index and qualitative interviews.

3. RESULTS AND DISCUSSION

Determining the Digital Readiness Index allowed the identification of the stage of digitalisation for the studied pensions. As an example, Figure 1 presents the stage of digitalisation for one of the agritourism pensions from our study.

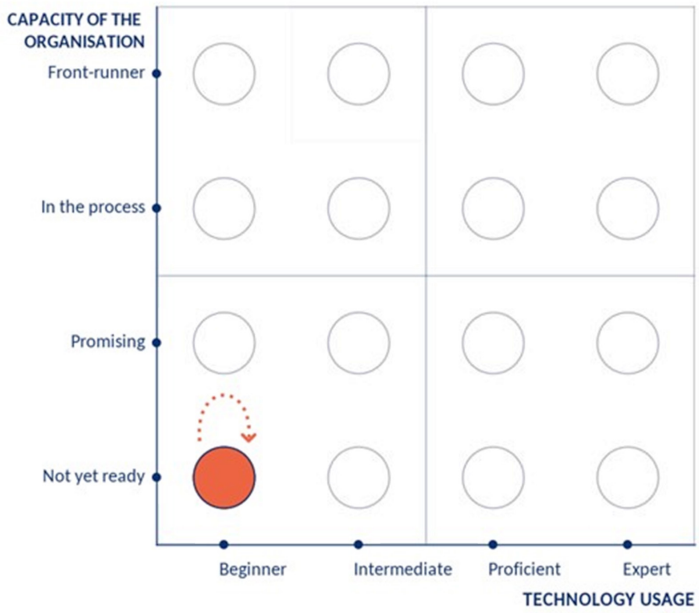

Figure 1. Example of a graph for stage of digitalisation for the agritourism pension
Source: Own research

The graph indicates the digital readiness of the agritourism pension based on two areas, the technology usage and the capacity of the organisation, using the position and the colour of the circle. The recommendations are to improve the digital level. Our focus was on deciphering the varying degrees of technological integration within agritourism pensions.

Understanding the distribution of technology usage is pivotal in shaping the narrative of how these establishments navigate the evolving demands of the digital era. Before delving into percentage calculations and identifying their implications, it's essential to recognize the diverse nature of agritourism pensions. Factors such as size, resources, and the adaptability of each establishment contribute to a nuanced technological landscape. This study seeks to provide a comprehensive overview. By calculating the percentages of pensions at different technology proficiency levels, we aim to draw meaningful conclusions that can guide stakeholders, policymakers, and individual agritourism entrepreneurs. These insights are not just numbers; they represent the potential for growth, collaboration, and sustainable development within this unique sector.

The collected data is used to quantify the levels of technology usage among agritourism pensions and extract valuable insights that pave the way for a more informed and technologically empowered future for these rustic havens. We calculate the percentages of technology usage levels among the agritourism pensions, we can count the number of occurrences for each level and then express it as a percentage of the total number of pensions.

Dominance of Beginner Level: a significant majority, approximately 56%, of agritourism pensions from our study are at the beginner level of technology usage (Figure 2). This suggests a prevalent need for further adoption and integration of technology in these establishments. Around 20% of agritourism pensions have reached an intermediate level of technology usage. While not the majority, this indicates a moderate level of tech-savviness among a portion of the establishments. Both the proficient and expert levels exhibit a similar percentage, each comprising 12% of the total. This suggests that a comparable number of agritourism pensions have achieved a higher level of technology proficiency, showcasing a balanced distribution in the more advanced tiers.

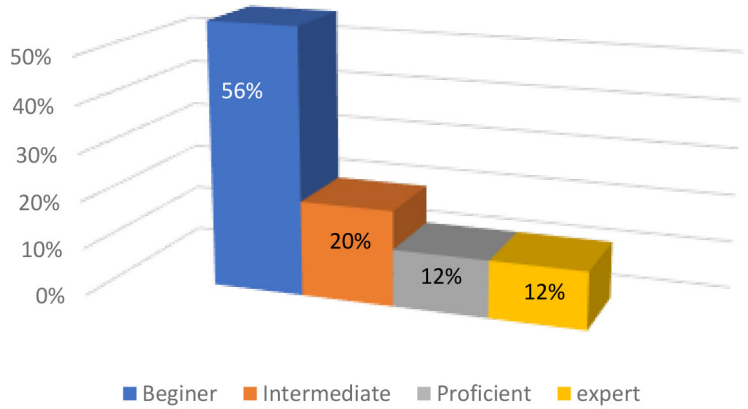

Figure 2. Graph of the level of technology usage in agritourism pensions from the county Gorj
Source: Own processing

A significant portion, accounting for 36%, of agritourism pensions is currently in the process of enhancing their organizational readiness (Figure 3). This suggests a widespread movement toward embracing technological and organizational advancements. A substantial 32% of pensions indicate that they are not yet ready for advanced technological adoption. This presents an opportunity for targeted interventions and support to elevate their organizational capacities. While 24% of pensions are deemed promising, signifying an initial level of preparedness, this category may indicate establishments with the potential to lead in technological adoption with the right support and resources. A small but noteworthy 8% of agritourism pensions are identified as front-runners, indicating a high level of organizational readiness. These establishments could serve as exemplars for others in the industry.

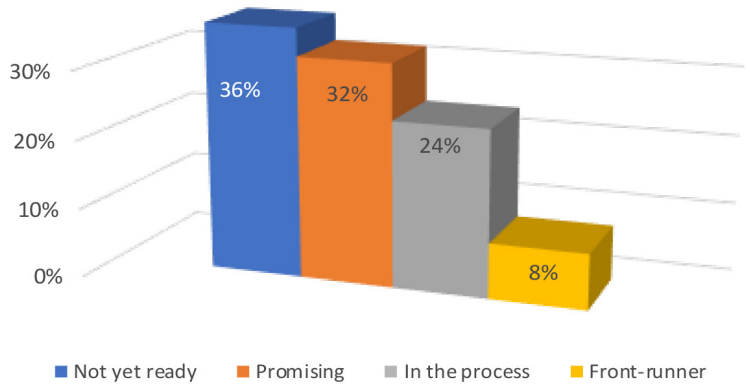

Figure 3. Graph of the level of capacity of the organisation in agritourism pensions
Source: Own processing

Emphasise that the potential of social innovation is further increased by the availability and accessibility of new emerging tools and technologies like AI. This IT-enabled or digital social innovation can help to digitalise social services processes and to make them more proactive, and more goal-oriented and needs-driven. They also promote direct engagement of citizens in the whole social services process design and management. In other words, (digital) social innovation can become the real driver of social change, thus promoting also equality and shared prosperity (Misuraca & Pasi, 2019).

Following the processing of the data collected as a result of the exploratory qualitative interview-based research, we can observe that, regarding the positive effects to be generated by the development of agritourism activities in the area through digitization, the majority of respondents are of the opinion that they will not be late to defend. Talking about the positive effects that will be registered at the economic level, 37% of the respondents place their answers in the „totally agree" area, 40% in the „agree" area, 14% in the „neither agree nor disagree" area, 3% in the „disagree" area „, and 1% are in the „totally disagree" area, the situation being similar for the positive effects that will be felt at the social level, so that 32% of respondents place their answers in the „totally agree" area, 43% in the „agree" area, and 21% in the area „neither agree nor disagree", 3% „disagree", and 4% „totally disagree" (Figure 4). In relation to the positive effects that will be felt at the level of environmental protection, and here it can be observed that the entrepreneurs are of the opinion that they will exist, 36% of the answers being placed in the „totally agree" area, 35% in the „agree" area, 21 % are undecided, placing the answers in the „neither agree nor disagree" zone, and 8% are more pessimistic, considering that they will not exist.

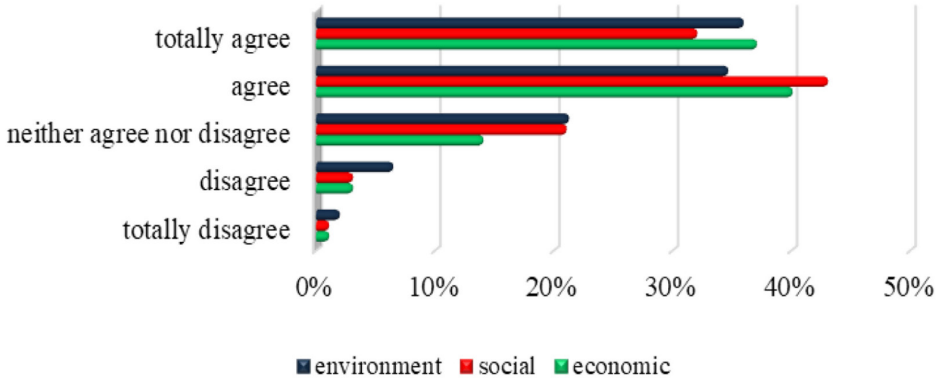

Figure 4. Positive effects as a result of the development of agritourism
Source: Own processing

Analyzing the possibility of the appearance of negative economic effects following the development of agritourism in the area, we notice that the majority of entrepreneurs of agritourism pensions interviewed place the most answers in the "disagree" area, namely 82%, 5% are "totally disagree", and 12% are found in the "neither agree nor disagree" range.

In relation to the negative social effects, the trend is maintained, 78% of the interviewees place themselves in the "disagree" area, 5% in the "totally disagree" area, and 17% in the "neither agree nor disagree" area, the situation being similar for the negative effects as well related to environmental protection as a result of the development of agritourism tourism with 77% of the interviewed population placed in the "disagree" area, 4% in the "totally disagree" area, and 19% in the "neither agree nor disagree" area (Figure 5).

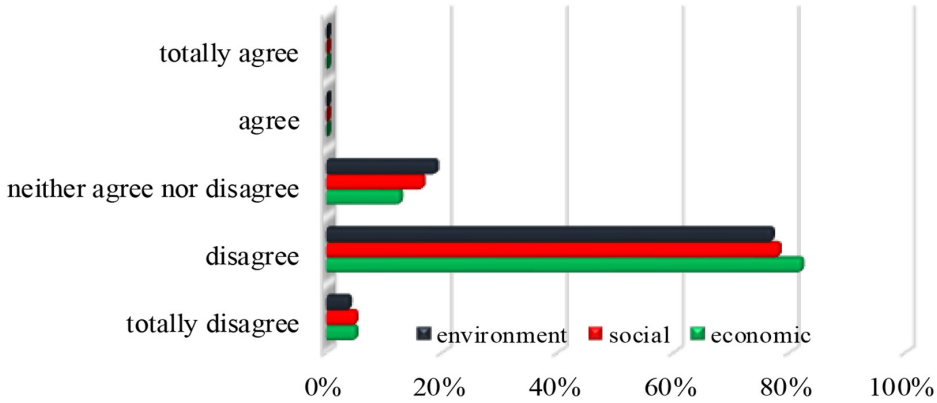

Figure 5. Negative effects as a result of the development of agritourism
Source: Own processing

The results of the analysis show, without a doubt, that those interviewed are of the opinion that there will be benefits in all sectors.

Table 2. Digital Tool Adoption and Support Needs Among Tourism Stakeholders

ID	Digital Tools Used	Digital Tools Help Attract Tourists (1–5)	Main Barriers (Open-Ended)	Support Needed (Multiple Choice + Text)
P1	Website, Facebook	5	Lack of time, low digital skills	Training, mentoring
P2	Facebook only	4	No internet in the area	Infrastructure, funding
P3	Booking.com, Google Maps	5	High platform fees	Own website support
P4	Instagram, TikTok	4	Time-consuming	Social media training
P5	None	1	Technological fear	Beginner digital literacy courses
P6	Website, payments	5	Maintenance costs	Financial support
P7	Google Ads	4	Too complex	Digital marketing consultant
P8	TripAdvisor, Facebook	5	Review management	Reputation strategy tools
P9	Excel	3	No integration with bookings	CRM systems
P10	WhatsApp	3	Not professional-looking	Email and website building
P11	Instagram	4	Limited audience	Cross-platform promotion
P12	Website, PMS	5	Setup difficulties	Technical assistance
P13	Facebook, Messenger	3	Low client interaction	Marketing campaign help
P14	None	2	Don't know where to start	Introductory workshops
P15	Google My Business	4	Hard to update	Quick-use guides
P16	Booking platforms	5	Dependence on third parties	Platform independence tools
P17	Online reviews	4	Negative feedback handling	Reputation management
P18	Facebook, Google Drive	3	Hard to manage content	Support staff
P19	Airbnb, Booking.com	5	Calendar sync issues	Channel manager software
P20	Email marketing	3	Low response	Campaign training
P21	YouTube	4	Content creation difficulty	Video editing courses
P22	Website + SEO	5	Don't understand SEO	SEO training
P23	None	1	Afraid of fraud	Safe tool guidance
P24	Facebook + SMS	3	Poor phone signal	Mixed strategy approach
P25	Instagram, Reviews	4	Language barriers	Translation templates

Source: Own processing

To better understand the level of digital adoption and the needs of agritourism stakeholders, a structured questionnaire was applied to 25 respondents. The instrument included both closed and open-ended questions, covering four main dimensions: digital tools currently used, perceived benefits of digitalization, encountered barriers, and types of support required for future development. Table 1 presents a summarized version of the responses, highlighting individual variations and common themes relevant to the implementation of digital technologies in the agritourism sector.

In the context of Society 5.0, where digital transformation aims to create a human-cantered and sustainable society, agritourism represents a promising sector for integrating innovation with rural development. However, the adoption of digital tools in small agritourism businesses remains inconsistent and under-researched. This study was initiated to gain a deeper understanding of the current level of digital readiness among agritourism stakeholders, explore the benefits they perceive from adopting digital solutions, and identify the main barriers and support needs they encounter. By using a structured questionnaire, the research aims to capture both quantitative trends and qualitative insights that can guide future policies, capacity-building initiatives, and targeted interventions to accelerate digital transformation in rural tourism contexts.

Although the research is geographically limited to Gorj County, the findings offer **valuable and context-specific insights** into the digital transformation processes within rural agritourism. The **mixed-method approach,** while basic in its structure, is clearly articulated and effectively applied. The combination of quantitative and qualitative data has allowed for a **comprehensive understanding** of the digital readiness, perceived benefits, and support needs of local agritourism stakeholders. The results are particularly revealing for this case study, highlighting not only infrastructural and educational barriers but also the **strong potential for targeted interventions** in similar rural contexts. Thus, this study contributes new knowledge to the emerging literature on sustainable tourism in the digital era and provides a **replicable framework** for further research in other regions.

One limitation of this study is the **response rate:** out of 50 agritourism pensions contacted, only **25 provided complete responses** to the questionnaire and interviews. While this sample size is adequate for a **qualitative case study**, it may limit the representativeness of the findings. The results should therefore be interpreted with caution when considering broader generalizations beyond **Gorj County.** Non-responses may reflect a lower level of digital engagement or interest, potentially skewing the data toward more active or digitally aware participants. As such, the study provides **valuable exploratory insights,** but further research with a larger and more diverse sample would be needed to validate and expand upon these findings in different regional or national contexts.

Despite awareness of digital tools, several **practical barriers** hinder their implementation. These include the **high initial investment costs** for platforms and hardware, the **need for staff training,** and **resistance to change** from business owners unfamiliar with technology. In remote areas, poor internet connectivity further complicates the digital transition.

4. FUTURE RESEARCH DIRECTIONS

Future research should investigate the specific factors influencing technology adoption within agritourism pensions. Factors such as geographical location, available resources, and the unique challenges faced by each establishment merit thorough investigation. Conduct a detailed examination of specific factors influencing technology adoption, such as size, resources, and adaptability. Develop targeted strategies to support pensions at different readiness levels, fostering a more cohesive and technologically advanced agritourism sector. Undertake a longitudinal study to track the progression of technology adoption and organizational capacity over time, providing dynamic insights.

5. CONCLUSION

As we draw conclusion from the digital readiness analysis of agritourism pensions in Gorj County, it is imperative to situate these findings within the broader context of Society 5.0, where the fusion of technology and societal needs shapes a human-centric future. The evolution of agritourism in this digital era becomes not just a local phenomenon but a microcosm of societal transformation, reflecting the principles and aspirations of Society 5.0. the dominance of agritourism pensions at the beginner level of technology adoption echoes the foundational principle of ensuring technology serves human needs. This signifies a starting point where digital tools should align with the unique characteristics and aspirations of agritourism, contributing to the betterment of both the sector and the local community. Society 5.0 emphasizes inclusivity, ensuring that technological advancements benefit all layers of society.

In the context of agritourism, interventions should go beyond technology adoption and encompass comprehensive digital literacy initiatives. These initiatives should be tailored to the varying readiness levels identified, fostering inclusivity and empowering stakeholders across the spectrum. One of the pillars of Society 5.0 is the creation of collaborative ecosystems where diverse entities collaborate for mutual benefit. Agritourism establishments, ranging from beginners to front-runners, can form a collaborative ecosystem where knowledge, expertise, and resources are shared. This collaborative spirit not only accelerates the technological learning curve but also creates a resilient and interconnected agritourism network.

While the study provides descriptive statistics (frequencies and percentages) to illustrate key trends among the respondents, no **inferential statistical tests** (e.g., significance testing, correlations) were applied due to the **exploratory nature and small sample size** (n = 25). The intention was not to generalize findings to a larger population, but rather to **identify patterns and raise hypotheses** for further research. Nevertheless, future studies could benefit from including **inferential analyses**, such as **chi-square tests** for association between variables (e.g., type of digital tool used vs. perceived effectiveness) or **correlation coefficients** to assess relationships (e.g., between digital readiness and support needs).

The findings, especially the prevalence of agritourism pensions in the process of enhancing organizational readiness, indicate a collective movement toward sustainable technological integration. Future interventions should prioritize solutions that align with environmental sustainability, promoting practices that enhance both technological innovation and ecological balance. Agritourism pensions at the proficient and expert levels represent the vanguard of future-ready entrepreneurs. These establishments are well-positioned to lead not only in technological adoption but also in demonstrating how technology can be harnessed for societal benefit. They serve as examples, illustrating the possibilities when technology aligns with the societal fabric.

The majority of agritourism pensions are at the beginner level, emphasizing the need for focused efforts to enhance technological integration. A considerable percentage is actively improving organizational readiness, while others present opportunities for targeted interventions. Small percentage of agritourism pensions are identified as front-runners, serving as exemplars for the industry. The implementation of technologies and the introduction of digitization in the agritourism sector have been met with an overwhelmingly positive perception. Local communities and stakeholders have confidently embraced digital innovations, recognizing their benefits in improving the quality of life and efficiency in agricultural and tourism activities. Increased efficiency in agricultural practices, sustainable resource management, and enhanced collaboration have

contributed to the solidification of this positive perception. This digital transformation not only brought about positive economic impact through the promotion of tourism and access to global markets but also acts as a catalyst for long-term sustainable development. Successful experiences serve as a model for expanding similar initiatives in other regions and economic sectors, reinforcing the vision of a human-centred Society 5.0 that strikes a balance between economic progress and addressing social challenges.

While this study identifies key opportunities and barriers related to digitalization in agritourism, the **practical implementation of proposed solutions** warrants further elaboration. Future work should integrate **concrete case studies** that showcase how similar businesses have successfully adopted digital tools—such as dynamic pricing through booking platforms, targeted marketing via social media, or the use of automated property management systems (PMS). For example, agritourism pensions in other EU regions have benefited from partnering with regional digital innovation hubs, participating in EU-funded upskilling programs, or integrating online booking systems with local tourism networks. Including such best practices would not only validate the relevance of the proposed tools but also provide **actionable guidance** for stakeholders in Gorj County and beyond. This practical dimension is essential for turning awareness into adoption and for advancing sustainable rural development in line with Society 5.0 objectives.

The digital readiness analysis of agritourism pensions in Gorj County serves as a foundational exploration, laying the groundwork for informed decision-making and strategic planning. The insights gained from this study extend beyond numbers and percentages; they represent the potential for growth, collaboration, and sustainable development within a unique sector. As the agritourism industry navigates the digital era, the fusion of technology, organizational capacity, and a spirit of innovation will be instrumental in shaping a resilient and thriving future.

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Original Scientific Article

The Circular Economy and the Role of Stakeholders in the Sustainability of Tourism in Romania

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Abstract: *The circular economy is considered one of the most pertinent solutions to major contemporary socioeconomic and environmental sustainability challenges. This paper seeks to highlight the roles that stakeholders play in sustainable tourism in the country, as well as identify some of the challenges in developing competitive advantage through the circular economy. The present research aims to evaluate the level of involvement of public and private sector organizations in circular economy practices and to characterize the current state of implementation of circular practices and strategies in private and public organizations. The conclusion of this study is that the challenges in the tourism industry in Romania are many and the involvement of public and private sector organizations are essential to achieve a transition to the circular economy in the tourism sector.*

Keywords: *Circular economy, Stakeholders, Sustainable tourism.*

JEL Classification: M21 · Q01 · Q56

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1. INTRODUCTION

The circular economy is gaining increasing importance in creating sustainable tourism. In this context, the present study aimed to evaluate the level of involvement of public and private sector organizations in circular economy practices in Suceava County.

The participation of organizations from the public and private sectors and the academic environment in this study is essential for the research and characterization of the state of the implementation of circular economy activities at the level of Romania.

There have been many requests to improve the performance of Romania's tourism sector. This study covers one of the most important phases of tourism development. This study focuses on stakeholder participation in tourism planning in Romania. This study attempts to identify the challenges in the participation of interested parties in planning the transition of tourism from the linear model to the circular economic model.

Studying the roles of stakeholders in ensuring sustainable and circular tourism is important and timely because Romania is a country with great potential. Romania's resources are limited, and economic development generates, increasing levels of consumption on a global scale, contributing to the scarcity of resources and an increase in waste generation.

As we well know, the economic system of the circular economy aims to reconcile economic and environmental performance by adopting an innovative approach to address the relationship between business and the environment. The circular economy aims to achieve sustainable production and consumption (Blomsma & Brennan, 2017).

2. THEORETICAL FOUNDATION

A circular economy is considered one of the most relevant solutions to major contemporary socio-economic and environmental sustainability challenges such as climate change, biodiversity loss and resource depletion. The central objective of the circular economy is to conserve natural resources and use materials efficiently and sustainably, while achieving balance and harmony between the economy, environment, and society. Indeed, it has attracted increasing interest among scholars from various disciplines as well as business practitioners, policy makers and other societal actors.

Sustainable Travel International estimates that transport as a whole contributes 49% to the carbon footprint of the tourism sector, followed by the purchase of goods (12%), food and drink consumption (10%) and agriculture (8%).

For tourism to be sustainable, all actors must be involved. Freeman (1984) defines stakeholders as "any group or individual that can affect or is affected by the achievement of the organization's objectives". Four main stakeholders that play roles in tourism development.

According to Goeldner and Ritchie (2005), there are four main stakeholders that play an essential role in tourism development. They are the tourist, the business providing tourism goods and services, (the entrepreneur), the government of the host community or area, and the host community, i.e. the residents.

Previous research has presented various findings regarding the roles and interests of stakeholders in a circular economy. For example, Marjamaa et al. (2021) examined the shared sustainability interests

of stakeholders; Geissdoerfer et al. (2017) stated that in a circular economy, governments, firms and NGOs play key roles as agents driving systemic change; and more specifically, Govindan and Hasanagic (2018) pointed out that when establishing circularity in supply chains, governments play an important role by promoting circularity through objective laws and policies. However, to implement a large-scale circular economy and initiate systemic change, the support of all stakeholders is vital (Lieder & Rashid, 2016). In the study conducted by Ma and Hao (2024) we can see that stakeholder engagement and key closed-loop strategies are integrated as part of a circular economy for waste management.

Table 1. Identifying the critical points for promoting the circular economy in tourism

Impact category Tourism element	Energy use	Water use	Other resource use or overconsumption	Waste	Climate change	Biodiversity
Accommodation: Buildings	Warm	Warm	Warm	Warm	Warm	Warm
Accommodation: Operations	Warm	Warm	Warm	Warm	Warm	Cold
Restaurants and bars: Buildings	Warm	Warm	Cold	Warm	Cold	Cold
Restaurants and bars: Operations	Warm	Warm	Warm	Warm	Warm	Cold
Transport: Local	Warm	Cold	Cold	Cold	Warm	Warm
Transport: Origin to destination	Warm	Cold	Warm	Cold	Warm	Warm
Activities: Events, attractions and festivals	Warm	Warm	Warm	Warm	Cold	Warm
Services (tour operators, travel agencies, financial and booking services)	Cold	Cold	Cold	Cold	Cold	Cold

Source: UN Economic and Social Council, (2021), Draft assessment of applying principles of circular economy to sustainable tourism in the pan-European region, https://unece.org/sites/default/files/2021-09/2112197E_0.pdf

Stakeholder engagement is important for value co-creation, i.e. creating value with and for stakeholders (Freeman, 1984), is prominent in many chapters. Stakeholder relations must be examined in light of both firm- and stakeholder-focused approaches, as well as the positive and more contradictory aspects of stakeholder engagement. Stakeholder relationship management guarantees the design of sustainable strategies (Galati & Adamashvili, 2023).

Developing and maintaining a circular economy is an essential step towards a more environmentally friendly and socially inclusive society. In addition to redesigning products and business models to minimize waste and increase material reuse, a transition to a sustainable circular economy requires collaboration and cooperation between various stakeholders from all parts of society.

3. MATERIALS AND METHODS

The research aims to evaluate the level of involvement of public and private sector organizations in circular economy practices and to characterize the current state of implementation of circular practices and strategies in private and public organizations.

To conduct the study, the following stages were completed: documentation phase, methodology development phase, research instrument development phase, data collection, data analysis and last but not least, writing the paper - results, discussions.

In this study, two complementary research methods were used: quantitative and qualitative. The first study is quantitative research that provides a representative picture of the circular economy in the tourism sector business environment in Suceava County, while the qualitative research reinforces the idea that the transition to the circular economy represents an important step for the sustainable development of the tourism sector. The data collection tool used in the quantitative approach was a questionnaire, which was distributed to a target group, while the qualitative method was based on an interview.

In this study, a research tool was used for respondents from the private, public, and academic environments, and respectively a research tool for stakeholders from the private, public and academic environments, as follows:

- A questionnaire about the level of involvement in circular economy practices.
- An interview addressed to stakeholders from the private, public, and academic environments.

The survey was open for two weeks in August 2023. The questionnaire was composed of 26 questions that were classified into 9 thematic groups that match the different aspects of the process of implementing circular economy practices.

The nine thematic groups of the questionnaire were included: general context, circular economy in general, circular economy practices in internal processes and operations, strategy and management, circularity of public procurement, human resources, evaluation and communication, collaboration with stakeholders and last but not least factors influencing circularity.

A total of 22 of the 50 organizations approached responded to the survey, corresponding to a response rate of 44%. More precisely, 18 private institutions and 4 public institutions responded to the questionnaire.

Compared to similar studies done for sustainability issues with response rates of 36% (Parker & Bradley, 2000) and 31% (Nogueiro & Ramos, 2014), this can be considered a high response rate for a survey addressed to this type of organization.

The target group of the quantitative research is represented by 50 people residing in the North-East region, who own a business in the tourism sector such as tourist reception structures with accommodation function and/or tourist reception structures with public catering function or people who hold management positions within these businesses. The people in the target group must have experience in the tourism industry.

The target group of the qualitative research is made up of people residing in the North-East region, with relevant experience in the field of tourism, being affiliated with public institutions, organizations specialized in tourism services, organizations specialized in accommodation services, research institutions or professional organizations such as the „Ștefan cel Mare" University of Suceava, the „Bucovina" Tourism Association, the Arnis Recreation Complex in Gura Humorului, the tourism department of the Suceava City Hall, travel agencies and accommodation units in Suceava, destination management organizations, and tour guides.

The interview included ten open questions that were personally addressed to each participant. In the first part of the interview, the respondents were asked to express their opinions about the current situation of the circular economy in the tourism sector in Romania. Respondents were asked to specify the factors that influenced their decision regarding the adoption of circular economy practices and

the inclusion of tourism stakeholders in the journey towards circularity. Interview respondents were asked to specify the organization's plans for fulfilling the European Union's vision or if they thought about fulfilling the European Union's vision in terms of achieving a circular economy by the year 2050. The role played by the Romanian tourism industry in fulfilling the European Union's vision, the future plans of the organization in terms of the circular economy and last but not least the challenges of the organization in terms of the transition to circular tourism.

3.1. Analysis of Responses from Private and Public Respondents

The information obtained from the survey is divided according to the sections of the questionnaire presented above. Most respondents to this questionnaire work in the private sector, only a percentage of 18.18 work in the public sector. This can be attributed to the fact that the private sector has developed more in the tourism industry. At first, the public environment did not see tourism as an opportunity.

Finally, 81.82% of the responding organizations have between 1 and 49 employees. And only 18.18% of the organizations have between 50 and 249 employees. Organizations with more than 249 employees did not participate in this study. This classification was chosen to match the existing categories for private companies (Eurostat, 2003).

The vast majority of respondents (90%) answered that they are aware of the circular economy concept. This is a positive result, demonstrating the momentum of the circular economy among public and private sector stakeholders. Additionally, 95% said the term is not mentioned/used in their organizations. In addition to these two questions, respondents were asked to explain what the circular economy means to them with a sentence or a few key words. The terms most often used to describe the circular economy were related to reuse, followed by recycling. In addition, respondents seem to associate the circular economy with resources, products and materials and emphasize waste reduction.

Such a perception of the circular economy corresponds to previous literature on public sector perceptions of sustainability, sustainable environment, which sees the circular economy as a practical solution to economic and social challenges, primarily oriented towards issues related to waste management and resource circulation for which increasing recycling and reuse is a significant component (Reike et al., 2018).

About 40% of respondents consider the circular economy relatively important for strategic activities (for example, annual management plans), 40% important and another 20% very important. While 40% consider the circular economy important and very important at an operational level (e.g. administrative procedures or daily tasks) and only 20% consider it relatively important. This could mean that more respondents consider the circular economy more important at the operational level than at the strategic level. This result would fit the idea of the circular economy is presented as a set of operational strategies aimed at sustainability.

Circular public procurement has been identified in specialized literature as an effective tool that can accelerate the transition to the circular economy, stimulating the development of innovative solutions and new markets for the circular economy (Ntsonde & Aggeri, 2021; Stahel & MacArthur, 2019). Therefore, a section of the survey was dedicated to questions about purchasing conditions in organizations and the adoption of a variety of circular economy criteria in purchasing decisions.

Table 2. Results on the adoption of circular practices in public procurement

	Yes, always	Yes, very often	Yes, often	No, never	I do not know	Not applicable
Remanufactured products	0%	0%	63,64%	0%	0%	36,36%
Recycled products	0%	0%	81,82%	0%	0%	19,18%
Products containing recycled materials	0%	0%	63,64%	18,18%	18,18%	0%
Products with the possibility of recycling or disassembly	0%	0%	63,64%	0%	18,18%	18,18%
Products with return guarantee of the supplied products	63,64%	0%	18,18%	0%	0%	18,18%
Products with waste collection system and related packaging	18,18%	0%	45,46%	18,18%	0%	18,18%
Equipment and technology with the highest energy efficiency (e.g. A++)	36,36%	27,28%	36,36%	0%	0%	0%
Products and equipment that require the supply of clean/renewable energy sources	36,36%	0%	0%	0%	27,28%	36,36%
Product selection criteria based on life cycle costs	0%	36,36%	36,36%	0%	27,28%	0%
Criteria for selecting your organization's environmental management system or other certifications/schemes aim to minimize waste, from materials to energy consumption, throughout the supply chain	18,18%	0%	81,82%	0%	0%	0%

Source: Own elaboration

Overall, 100% of responding organizations responded that they monitor their procurement procedures. 81.82% of respondents answered that they have an influence on the requirements and criteria for purchasing products and services for the organization. Among the requirements and criteria for the purchase of products and services for the organization, the respondents listed the following: writing specifications, choosing products that have a longer useful life and are more environmentally friendly. 68% of the respondents answered that they are allowed to purchase second-hand products and equipment, while 32% answered that they are not allowed to purchase second-hand products and equipment.

Regarding the implementation of an environmental management system or another environmental/sustainability management system/standard, the majority answered that no and it is not planned, and 36.36% of the respondents answered that they have not implemented, but it is planned.

In terms of efficiency and optimization practices, the majority, 81.82% of respondents, use double-glazed windows, and the remaining 18.18% stated that they are in the early stages of implementation. 63.64% of respondents said that they have implemented an LED lighting system, 18.18% of respondents stated that they are in the early stages of implementation, 18.18% stated that they have not implemented, but it is planned, and 18.18 % that they have not implemented and it is not planned. Although it is encouraging that more than half of the organizations are engaged in optimization efforts, as recognized by other studies (Mendoza, 2019). There is room for improvement to target wider implementation and towards closed-loop management of resources such as energy and water in the public sector.

Unfortunately, when it comes to ICT, we are in a bad place. 81.82% of respondents have not implemented the practice of providing a platform to share specialized equipment and technology internally and with other organizations, nor do they plan to implement it. But 18.18% of respondents have implemented this practice, so little by little, we hope all organizations will implement it.

Table 3. Results for efficiency and optimization practices

	Yes, it has been implemented	Yes, it is in the early stages of implementation	No, but it is planned	No, and it's not planned
Efficient use of water for toilets	27,28%	0%	36,36%	36,36%
Efficient use of water for tap water	45,46%	18,18%	18,18%	18,18%
Efficient use of water for other uses	18,18%	0%	63,64%	18,18%
LED lighting system	63,64%	0%	18,18%	18,18%
Centralized air conditioning management system	18,18%	0%	0%	81,82%
Double-glazing windows	81,82%	18,18%	0%	0%

Source: Own elaboration

Table 4. Results for practices aimed at reducing consumption and expanding the use of products and equipment

	Yes, it has been implemented	Yes, it is in the early stages of implementation	No, but it is planned	No, and it's not planned
Prohibition of single-use items (e.g., plastic items such as straws, cups, cutlery)	45,46%	18,18%	18,18%	18,18%
Provision of reusable products (e.g., mugs, bottles, cutlery, promotional materials)	81,82%	18,18%	0%	0%
Providing in-house repair services for products and equipment	63,64%	0%	18,18%	18,18%
Donating materials to other public organizations or social entities	81,82%	0%	0%	18,18%
Providing a platform to share specialist equipment and technology (e.g. ICT products) internally and with other organisations	18,18%	0%	0%	81,82%

Source: Own elaboration

Finally, digitization is seen as an important circular economy area of action for both the private and public sectors. This can be seen in the survey results, with high levels of adoption. Indeed, most respondents organize virtual meetings (81.82%) and adopt teleworking practices (81.82%). We can say that remote work has become mandatory in the context of the COVID-19 pandemic, but it has shown promising results in terms of work performance.

Table 5. Results regarding practices related to the digitization of administrative processes

	Yes, it has been implemented	Yes, it is in the early stages of implementation	No, but it is planned	No, and it's not planned
Implementation of a digital system for intelligent document management	36,36%	27,28%	36,36%	0%
An interoperable digital platform for internal and external procedures and communication	63,64%	0%	18,18%	18,18%
Digitization of documents intended for digital archiving	63,64%	18,18%	18,18%	0%
Organization of virtual meetings and conferences	81,82%	18,18%	0%	0%
Adopting telecommuting practices (e.g., working from home)	81,82%	0%	0%	18,18%

Source: Own elaboration

In addition to being a safety measure during health crises, one of the significant advantages of remote work is from a mobility perspective. For example, enabling the reduction of commuting distances and times and the related environmental costs due to transport.

63.64% of respondents have not adopted tools and strategic statements that include the term circular economy. Regarding the strategic instruments in which the circular economy is included, 100% of the respondents adopted the action plans. 63.64% of the respondents do not know/do not know the strategic documents in which the circular economy is mentioned.

Organizations were asked to rate each factor and barrier according to their importance (from very low to very high) in the process of adopting circular economy practices in the public sector. Considering the average score of all respondents, the most important factor, according to the responding organizations, was management commitment to the circular economy transition. This is consistent with the literature that states that any organizational change begins with the interest of management (González & Vargas, 2017).

Lack of stakeholder collaboration was recognized as a major obstacle to the implementation of the circular economy and the most common barriers identified were lack of consumer interest and awareness, organizational culture, operating in a linear manner, high initial investment costs, and last but not least, unwillingness to collaborate in the value chain/obstruction of laws and regulations. The most pressing regulatory barrier identified was the obstruction of laws and regulations.

3.2. Analysis of Stakeholder Responses

An interview with different types of tourism-related organizations was necessary to gather a wide range of information and gain a different perspective. Ten key people from Suceava County, Romania, took part in this interview. These were both from the private sector and from the private sector or academia. We wanted to find out where we stand and whether the term circular economy has become a common term in reports or in the workplace. We want to see where we are headed. This study had a qualitative orientation and required the use of a non-probability sampling method in the selection of respondents. Consequently, the purposive sampling method was used to select respondents for the study based on their ability to provide meaningful knowledge and information on the issue under study.

At the beginning of the interview, each interviewee was asked about their understanding of the circular economy in tourism. The stakeholders' response to the first question did not provide sufficient evidence that they understood the concept of the circular economy. Their answer was not related to the circular economy, but only to conservation.

The interviewees agree that there is a great ignorance of the circular economy model in the tourism sector and a great deal of confusion regarding its application and other actions related to sustainability. Therefore, the almost unanimous opinion is that both the private and the public environment must try to disseminate and raise awareness about the application of the circular economy in the tourism sector for companies, tourists, and citizens.

Regarding the current situation of the application of the circular economy model in the tourism sector, most of the interviewees agree that the application of the circular economy model is limited and that it has great potential for development.

The majority of those interviewed believe that the public sector, and especially the Romanian government, should promote a specific governance model to promote the circular economy in the tourism sector. It would be interesting if an ecosystem of innovation and collaboration were created between destinations and companies in promoting the circular economy. We can conclude that the circular economy requires collaboration between diverse stakeholders among entrepreneurs and corporate leaders, politicians, and researchers, especially when it comes to transformative system innovations enabling systemic change, to support a new business model for a sustainable future.

4. FUTURE RESEARCH DIRECTIONS

Although this study came up with some fascinating results, there are some limitations that need to be considered, especially with regard to the interpretation and generalization of the results. The use of a qualitative research approach and the small sample size mean that the results of the study may be limited to the sampled respondents and cannot be considered as the views of all respondents, although they raised very vital issues regarding sustainable tourism.

In future research, we also aim to analyze attitudes towards the circular economy, environmental behavior, and circular practices among tourists through a comparative analysis of a mature destination and a developing destination in Romania. We aim to identify the socioeconomic profile of tourists who present a more circular attitude and behavior in Romania by analyzing different aspects of this phenomenon. The aspects we will follow are tourists' awareness and their interest or reluctance to change their behavior during their hotel stay and the most common circular practices that the hotel industry needs to promote to achieve the transition to the circular economy model in the tourism sector.

5. CONCLUSION

In this study, we can view how stakeholders see developments in the tourism sector, and this can be used as a guide in developing policies and strategies in the tourism industry. The principles of the circular economy can be successfully applied in tourism by recycling tourist resources, monitoring energy consumption, water, detergents, or other categories of resources, improving waste collection, and introducing new tools such as digitization for reduced consumption of resources.

From the perspective of the systemic approach and analyzing the data obtained from the application of the questionnaire and the interview, the authors of the article underline that the circular economy can be a solution for the sustainable development of tourism from the perspective of applying an integrated management system.

Circularity and sustainability must be incorporated in all stages of a value chain to achieve a fully circular economy, from design to production and to the consumer. The Commission's action plan sets out seven key areas essential for achieving a circular economy: plastics, textiles, electronic waste, food, water, and nutrients, packaging, batteries and vehicles, and buildings and constructions.

Stakeholder engagement is a key element in implementing circular economy strategies. This enables organizations to effectively identify and address the needs and expectations of different stakeholder groups. This study found that circular economy initiatives are becoming more aligned with the interests and aspirations of stakeholders from both the private and public sectors.

The conclusion of this study is that there are many challenges in the tourism industry in Romania, and the involvement of public and private sector organizations is essential to achieve a transition to a circular economy in the tourism sector. The government must take the lead in providing basic infrastructure, such as roads, water, electricity, and security, to encourage stakeholders to invest in the sector. However, all stakeholders must work on their businesses to develop a competitive advantage and build a vibrant and sustainable tourism industry.

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Original Scientific Article

Students' Career in Tourism Industry in Northern Albania: A Comparative Analysis Between Vocational High School and University Diploma*

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Abstract: *First, this study seeks to examine the potential factors impacting a student's career in the tourism industry; secondly, it explores whether there are any significant differences in students' careers in the tourism industry based on demographic variables, such as education. Data was collected through questionnaires, distributed to the students in vocational high schools and universities in Northern Albania, in 2024. To find out the factors that impact student careers in the tourism industry, the factor and reliability analysis were used. The multiple regression analysis was performed, using the 'student career in the tourism industry' as the dependent variable and factors as: 'Perspective and Confidence in the Tourism Industry'; 'Personal and Professional Development', 'Values and Commitment in the Tourism Industry', 'Willingness to Adapt and Relocate' and 'Emotional Adaptation in the Tourism Industry' as independent variables. Several factors were found to have a significant impact on students' careers in the tourism industry. The results revealed that education has a significant impact on student careers in the tourism industry. University students expressed higher levels of students' career compared with vocational high school students, and the difference was statistically significant. Moreover, the results of the t-test for each of the five potential factors showed that there was a significant difference based on education.*

Keywords: *Students' career, Tourism industry, University, Professional high school, Northern Albania, Factor analysis.*

JEL Classification: I21 · J24 · L83 · P26 · J31

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1. INTRODUCTION

Vocational education plays a crucial role in equipping individuals with the skills and knowledge needed for careers across various industries. In Albania, as well as globally, vocational education systems face significant challenges in aligning training programs with labor market demands. A notable concern in Albania is the emphasis on general education over targeted skill development, as highlighted by a United Nations Development Programme (UNDP, 2021) report. While efforts such as work-based learning practices and partnerships with the private sector are gradually improving the system, particularly in the tourism sector, substantial gaps remain in bridging education and industry needs.

The tourism industry, a vital economic driver in Albania, underscores these challenges. Despite initiatives like the National Employment and Skills Strategy (Ministry of Finance, Republic of Albania, 2023), which seeks to tailor vocational programs to address skill shortages, issues such as low enrollment in tourism-focused programs and limited awareness of career opportunities persist.

Globally, similar patterns emerge. The hospitality and tourism industry reveals that students often view careers in the sector as offering limited personal fulfillment, despite valuing transferable skills and educational opportunities (Amissah et al., 2020). Likewise, British tourism students have low aspirations for careers in the field, often citing unclear career pathways and limited engagement with the industry (Ramakrishnan & Macaveiu, 2019).

This study examines the potential factors impacting a student's career in the tourism industry. It explores whether there are any significant differences in students' careers in the tourism industry based on education.

2. LITERATURE REVIEW

The Theory of Planned Behaviour (TPB), introduced over 30 years ago, is widely used in empirical studies to predict human behaviour. It identifies behavioural intention—driven by attitudes, subjective norms, and perceived control—as a key factor linking attitudes to actions (Ajzen, 2006, 2011; Armitage & Conner, 2001).

Studies demonstrate mismatches between education and industry needs. Wakelin-Theron (2014) identified a critical skills shortage in South Africa's tourism industry, emphasizing the need for higher education institutions to integrate employability skills into their programs. Similarly, Chen and Gursoy (2008) found that leisure, recreation, and tourism programs must focus on adaptability and comprehensive skill-building to prepare students for career success.

Bontenbal and Aziz (2013) examined student perceptions at Oman Tourism College, highlighting challenges such as low enrolment and unmet recruitment goals despite tourism's role in economic diversification. Richardson (2009) reveals that undergraduate tourism and hospitality students in Australia do not perceive the industry as providing the key attributes they consider essential when selecting a future career.

The impact of global disruptions, such as the COVID-19 pandemic, has also influenced tourism education and career strategies. Reichenberger and Raymond (2021) found that New Zealand tourism students adapted flexible, short-term career plans to navigate uncertainties. Despite disruptions, students maintained optimism about a sustainable and progressive future in tourism.

Research also explores the perceptions of secondary school students. Roberts (2024) highlighted that New Zealand's tourism education is perceived as vocational and less credible academically, contributing to negative attitudes toward careers in tourism. To enhance enrolment and engagement, it is essential to improve the perception of tourism education and its career opportunities.

Further studies analyse the gaps between student and industry expectations. For instance, Bustreo et al. (2018) revealed that Italian tourism students undervalue competencies like self-control and organizational ability, which are critical for the sector. Similarly, Brent et al. (2008) found discrepancies between student and practitioner perspectives regarding internships, calling for better alignment to enhance the effectiveness of experiential learning. Finally, Gomaa and Sobaih (2014) examined Egyptian students' perceptions of tourism and hospitality careers, revealing significant differences between students in tourism studies and hotel management. Tourism students showed more positive attitudes toward career opportunities, emphasizing the need for tailored career development strategies.

Alikaj (2017) examines factors influencing vocational training participation in Albania using Labour Force Survey data. The study identifies three key determinant groups: person-related, job-related, and employer-related factors. Technological advancements and structural unemployment drive the need for new skills, making vocational training crucial for workforce development. Moreover, while men traditionally dominated training, women's participation has increased, reflecting changes in their labour market role. The study offers insights for policymakers aiming to advance gender equality in training and employment.

Elmazaj (2016) explores overeducation in Albania's labour market, focusing on the mismatch between the growing number of tertiary graduates and market demands. The study highlights risks of an expanding education system misaligned with labour needs. While higher education offers benefits like better wages, job opportunities, and social outcomes, the oversupply of graduates raises concerns about degree devaluation, the nature of overeducation (temporary or structural), and the role of specific fields of study. National-level estimates reveal that this mismatch could weaken the economic and social advantages of higher education.

Gishti (2018) highlights the importance of social partnerships in vocational education and training (VET) to better align with labour market demands. Despite some successful examples, systemic efforts are needed to improve VET governance and align it with economic changes. The study emphasizes enhancing the roles, governance, and technical expertise of social partners, addressing their unclear responsibilities, and strengthening their capacity for effective participation in VET.

Vucaj (2016) critiques Albania's cultural bias for higher education over vocational training, despite higher wages and demand in technical fields. This preference weakens the link between vocational education and labor market needs, worsening labor shortages in technical professions, even with reforms like the Bologna Process.

Vocational Education and Training (VET) plays a crucial role in Albania's economic and social development, especially as the country seeks integration into the European Union (EU). Sela (2016) emphasizes the need for structural VET reforms to align Albania with labour market demands and modern standards. Despite low investment limiting quality and access, EU partnerships offer opportunities through funding, policy reforms, and best practices. The study uses qualitative methods to highlight resource gaps and the benefits of continued EU collaboration, underscoring VET's importance for Albania's economic goals.

Despite these diverse challenges and opportunities, the consensus across studies highlights the importance of aligning educational programs with industry demands, raising awareness about career potential, and addressing skill gaps to enhance employability in the tourism sector.

Based on the above-mentioned discussion, this study seeks to answer the following questions:

- What are the potential factors impacting a student's career in the tourism industry?
- Are there any significant differences in a student's career and in the potential factors based on demographic variables, such as education (professional high school and university diploma) and gender?

Consistent with the research questions raised, the following hypotheses are derived:

H1: There is a significant impact of potential factors on students' careers in the tourism industry.

H2a: There are significant differences in student's career in the tourism industry and in all potential factors based on education.

H2b: There are significant differences in student's career in the tourism industry and in all potential factors based on gender.

3. RESEARCH METHODOLOGY

3.1. Sample and Data Collection

This empirical study was conducted in 2024 using the data collected from Northern Albanian respondents by self-administered questionnaires. The target population consists of Northern Albanian students engaged in professional high school and university. Each respondent, prior to filling out the questionnaire, was asked if they had engaged in a professional high school or university in the academic year 2023-2024. The purpose of the study was kindly explained to each participant, and we explained that the data would be used for statistical purposes only.

Data were collected from the authors with the help of two assistants throughout March, April and May 2024. In total, 199 questionnaires were distributed. Nine incomplete questionnaires were eliminated from the analysis, leaving 190 valid questionnaires for further analysis.

3.2. Demographic Profile

The characteristics of the respondents are summarized in Table 1. A majority of the respondents (56.8%) were female. In terms of age, 24.2 percent are 16 years old, 11.6 percent are 17, 23.7 percent are 18 years old, the majority of the respondents (30 percent) are 19 years old, and 10.5 percent are 20 years old and above. In terms of education, the majority (52.6 percent) of respondents report having a high level of education (bachelor's degree or master's degree), and 47.4 percent have a professional high school diploma. As per their city majority (80.5 per cent) of the respondents are from Shkodra, 11.6 percent from Lezha, and 5.3 percent from Kukes. More than 75 percent of the respondents report their preference for the field of work in managing hotels. The data were coded and processed using SPSS.

3.3. Measures

PC-Perspective and Confidence. A multidimensional construct that measures an individual's perceptions, beliefs, and confidence regarding the tourism industry's career opportunities, financial potential, and job security.

PPD Personal and Professional Development in the Tourism Industry. A multidimensional construct that measures an individual's self-efficacy, academic preparedness, career growth expectations, and interest in continuous learning within the tourism industry.

VC Values and Commitment in the Tourism Industry. A multidimensional construct that measures an individual's alignment with core values such as sustainability, work-life balance, ethics, and personal values, as well as their commitment to professional growth and practical experience within the tourism industry.

WAR Willingness to Adapt and Relocate. A multidimensional construct that measures an individual's openness and readiness to work in diverse environments and relocate for career opportunities in the tourism industry.

EA Emotional Adaptation in the Tourism Industry. A multidimensional construct that measures an individual's capacity to adapt emotionally within the tourism industry, emphasizing the ability to manage emotions and form meaningful connections with clients.

SC Student Career Intentions in the Tourism Industry. A multidimensional construct that measures an individual's intention, preparedness, and clarity of career planning related to the tourism industry.

A five-point Likert scale (1 = "strongly disagree"; 5 = "strongly agree") was used to measure all items.

Table 1. Profile of the respondents (n = 190)

	Variable	Frequency (n = 190)	(%)
Gender	Male	82	43.2
	Female	108	56.8
Age	16	46	24.2
	17	22	11.6
	18	45	23.7
	19	57	30.0
	20 and up	20	10.5
Educational background	Professional High school	90	47.4
	University	100	52.6
Cities	Shkodra	153	80.5
	Lezha	22	11.6
	Kukes	10	5.3
	other	5	2.6
Field of work	Hotel and accommodation management	143	75.3
	Travel agency and trip planning	26	13.7
	Leading and guiding tourism experiences	13	6.8
	Event and conference planning	7	3.7
	Other	1	0.5

Source: Own calculations

4. RESULTS

Factor analysis is a statistical technique used to identify underlying relationships between measured variables by grouping them into latent constructs or factors (Meyers et al., 2013). This method provides a means to consolidate scattered information from multiple variables into a smaller, more manageable number of factors. This study used factor analysis with Varimax rotation. When performing such an analysis, importance should be paid to the factorial weights of each item. Each item had a factor loading higher than 0.70.

Table 2. Summary of measurement scales

Constructs	Items		α	Factor loading
Perspective and Confidence (PC)	PC1. PC2. PC3. PC4. PC5.	I believe the tourism industry offers promising career opportunities. I consider work in the tourism industry to be financially fulfilling. I value the career development potential the tourism industry offers. I am willing to work in the tourism industry to achieve my professional goals I am optimistic about the future prospects of the tourism industry.	0.917	0.906 0.879 0.868 0.851 0.855
Personal and Professional Development (PPD)	PPD1. PPD2. PPD3.	I believe I am academically well-prepared for a career in the tourism industry. I believe there are ample opportunities for career growth and advancement in the tourism industry. I am interested in pursuing additional training specific to the tourism industry.	0.860	0.851 0.906 0.900
Values and Commitment VC)	VC1. VC2. VC3.	Sustainability and responsible tourism practices are important considerations in my career goals. I consider the work-life balance in the tourism industry to be satisfying. I believe that integrity and professional ethics are essential for my career success in the tourism industry.	0.798	0.899 0.910 0.712
Willingness to Adapt and Relocate (WAR)	WAR1. WAR2. WAR3.	I value the opportunity to work in a dynamic and multicultural environment. For me, the chance to travel and work in diverse tourist destinations is a major career advantage in the tourism industry. I am willing to explore employment opportunities abroad to broaden my perspective and gain global experience in the tourism industry.	0.729	0.847 0.781 0.790
Emotional Adaptation (EA)	EA1. EA2.	I consider work in the tourism industry to be emotionally fulfilling. I see work in the tourism industry as an opportunity to form strong emotional connections with clients and positively impact their travel experiences.	0.719	0.884 0.884
Student Career (SC)	SC1. SC2. SC3.	I have a clear plan for the steps I will take after graduation. I feel informed and prepared to handle current trends and challenges in the tourism industry. I am well-prepared to enter the job market in the tourism industry field.	0.811	0.849 0.870 0.844

Source: Own processing

To measure reliability, we used Cronbach's Alpha coefficient. The measure "PC" reported the highest level of Cronbach's alpha (0.917). On the other hand, Cronbach's alpha for the measure "PPD" was 0.860, for the measure "VC" was 0.798, for the measure "WAR" was 0.729, for the measure "EA" was 0.719, and for the measure "SC" was 0.811. All of these levels indicate adequate reliability (Hair et al., 2010).

4.2. Regression Analysis

To explore the potential factors impacting student careers, we performed multiple regression analyses, using student career (SC) as the dependent variable. The five potential factors: PC, PPD, VC, WAR, and EA were used as the independent variables. Below, we present only the variables that were found to be marginally significant or significant.

In the first model, we entered the five potential factors as the independent variables and student career as the dependent variable. The results indicated that the model was highly significant (p = 0.000); however, "PC", "PPD" and "VC" variables were not significant. R-squared =.541, which indicates that 54.1% of the total variance has been explained by the contribution of all the independent variables included in the model.

Dropping the variables that were not significant and re-running the regression analysis, we found the second model to be highly significant ($F(2,187) = 103.223$, $p = 0.000$); adjusted R^2 was 52.5%.

The remaining significant variables were: "WAR" ($p = 0.000$), and "EA" ($p = 0.000$). Consequently, hypothesis H1 was partially supported, given that we found two factors, such as "WAR" and "EA", to have a significant impact on Student Careers (SC).

4.3. t-Test

To test whether there were any significant differences in students' careers and the potential factors based on demographic variables, such as education (vocational high school and university diploma), we performed a t-test analysis, using a 1% level of significance.

The results indicated that there are significant differences in students' careers and all the potential factors based on demographic variables, such as education (vocational high school and university Diploma). More importantly, university students expressed higher levels of students' career (SC) ($M = 4.770$, $SD = 0.22$) compared with vocational high school students ($M = 3.895$, $SD = 0.89$); moreover, the difference was statistically significant ($t(188) = 8.463$, $p = 0.000$ (two-tailed)). On the other hand, the results of the *t*-test for each of the five potential factors showed that there was a difference; moreover, the findings were significant ($p = 0.000$ (two-tailed)). Consequently, hypothesis H2a was supported.

To test whether there is a significant difference in students' careers based on gender, a t-test was performed. The result indicated that there was a difference; in fact, the mean students' career for females ($M = 4.521$, $SD = 0.59$) was higher than mean students career for males ($M = 4.235$, $SD = 0.89$); moreover, the difference was statistically significant ($t(188) = 2.65$, $p = 0.009$ (two-tailed)). On the other hand, the results of the *t*-test for each of the potential factors showed that there was a difference; moreover, the findings were not significant for most of them. Consequently, hypothesis H2b was partially supported.

5. FUTURE RESEARCH DIRECTIONS

Despite its contribution to existing literature, this study is subject to certain limitations. The sample size used is small (n = 190), therefore limiting the generalization of the findings. Additionally, the study offers a snapshot of students' perceptions of three cities in Albania: Shkodra, Lezha, and Kukes. As a result, the findings may not accurately represent the perceptions of students in other cities in Albania. Furthermore, the data collected does not reflect changes in behaviour over time. Based on these limitations, future research should extend the study to other cities and countries, too.

Despite these limitations, the study offers valuable insights into the examination of the potential factors impacting a student's career in the tourism industry. It explores whether there are any significant differences in students' careers in the tourism industry based on education and gender.

6. CONCLUSION

This study provides valuable insights into the factors influencing student careers and underscores the importance of demographic considerations in career development programs. The regression analysis revealed that out of the five potential factors (PC, PPD, VC, WAR, and EA), only "WAR" (Work-Activity Relevance) and "EA" (External Assistance) had a significant impact on student career outcomes. The t-test results demonstrated significant differences in student career outcomes based on educational levels (vocational high school vs. university diploma). University

students exhibited higher levels of students' career (M = 4.770) compared to vocational high school students (M = 3.895), and this difference was statistically significant. Additionally, significant differences were found in all the potential factors based on educational levels. The analysis also revealed significant gender-based differences in levels of students' careers. Female students had higher levels of students' career (M = 4.521) compared to male students (M = 4.235), and this difference was statistically significant. However, while gender differences were observed for the potential factors, the findings were not significant for most of them.

The findings emphasize the importance of "WAR" and "EA" as key factors influencing student career success. This suggests the need for initiatives that enhance work relevance and provide external assistance to support student career development. The observed differences based on education and gender highlight the need for tailored career development strategies that address the unique challenges and strengths of different demographic groups.

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Review Paper

Regulation of Platform Work in the EU: A Comparative Analysis of the Draft Directive of 2021 and the Directive (EU) 2024/2831

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Abstract: *This article aims to analyse the normative evolution from the initial proposal of the European Commission in 2021 on the regulation of work on digital platforms to the adoption of Directive (EU) 2024/2831. The 2021 draft was perceived as a step towards formalising the status of platform workers and establishing a legal presumption of the existence of an employment relationship. However, the interinstitutional negotiation process lasted over two years and resulted in significant changes in content and the balance between worker protection and the flexibility required by platforms. The article examines the main differences between the Draft Directive of the EU and the Directive of the EU 2024/2831. These two legal acts focus on provisions related to legal presumption, algorithmic management, transparency, and collective participation. By analysing the reasons that led to the final modifications and their expected impact on labour law at the European level, the paper aims to contribute to the debates about fair and effective labour regulation in the digital economy.*

Keywords: *Digital economy, Digital labour, Directive, Employment relationship, Algorithmic management.*

JEL Classification: K31 · K23 · J08 · J38 · L51

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1. INTRODUCTION

The employment relationship is a social relationship regulated by legal norms, created between two parties: the employer and the employee. The employee offers their services in exchange for a reward, which are performed subject to and in accordance with the rules established by the employer. This concept has defined the legal employment relationship for decades, emphasizing that it involves two parties and is characterized by two key elements, subordination and remuneration. Over the years, under the significant influence and rapid development of digitization and artificial intelligence, we have observed a shift in the legal relationship of work. Determining who qualifies as being in an employment relationship has become increasingly complex in recent decades, due to significant transformations in the organization of work and the challenges faced by legal frameworks in keeping pace with these changes (Casale, 2011). Many countries today face challenges in legally defining the parties to an employment relationship, particularly in determining whether the worker performs their duties by the traditional model of employment that has long been the legal norm. Today's technology is bringing a real challenge to the work relationship, the first because it is being used to camouflage the work relationship by bringing an existing three-party work relationship, and the second is that national legislations are unprepared to create more the same pace with technological development, to draft legal provisions that regulate these tripartite work relationships.

This article addresses a work relationship that has emerged in recent years, particularly in the context of work on digital platforms. We encountered the first definition of this new form of work in the 2021 Eurofound report, where work on digital platforms was defined as "*the absorption of demand and supply of paid work through an internet platform using an algorithm*." In this labour relationship, three parties are involved: the client seeking work, the platform that manages the algorithm, and the person offering the work through the platform. This kind of work is based on completing individual tasks or projects rather than an ongoing employment relationship. A larger task is usually broken down into smaller sub-tasks, or 'micro-tasks', which are independent, homogeneous, and contribute to producing a specific product (Eurofound, 2021). Digital work platforms are reshaping employment relations and thereby redefining actors, their roles, and power in economic exchange. At the same time, the work opportunities they offer are characterized by precarious work and employment conditions, raising calls for appropriate regulatory responses (Piasna, 2024).

Working from digital platforms from the perspective of employees was seen as a good alternative to becoming part of the labour market, especially for people who found it difficult to exercise this right. We are talking here about individuals who were outside the labour market, such as disabled people, immigrants, women, and people who were dissatisfied with their salaries (Van Doorn, 2017). A very important element for working on digital platforms is the geographical position, or more precisely, the breaking of any geographical border. To be employed in a digital platform, it doesn't matter where in the world you are, you may have been born in country X, live in country Y, and work in country Z. This means that employers can find new workers anywhere in the world as long as the workers have the relevant information technology tools and internet connection (Wood et al., 2019). However, for workers, the combination of the global market and labour surplus (or at least the perception of labour oversupply) is experienced as something that significantly lowers the wages they can command (De Stefano, 2016).

One of the main driving factors for joining digital work platforms is the lack of established barriers to starting work, such as the absence of formal interviews or the requirement for prior work experience (Eurofound, 2018). According to Heeks (2017), there are approximately 70 million

platform workers registered globally in the labour market, and according to estimates by the World Bank, these figures were expected to reach $ 15-20 billion by 2020. Also referring to the economist Guy Standing, who has stated that by 2025, platforms will mediate a third of all work transactions. As a result, this new form of employment, which is undergoing significant development and broad involvement of people, definitely requires the attention of state bodies to regulate it in a way that does not violate the essential principles at work, as well as the rights of individuals.

2. THE EU'S NORMATIVE JOURNEY TOWARDS REGULATING WORK ON DIGITAL PLATFORMS

Platform work has rapidly become one of the most widespread and problematic forms of non-standard work in the European Union. The growth of this model, coupled with profound uncertainties in the legal classification of workers, has led to a regulatory vacuum that challenges the fundamental principles of European labour law. The most significant problems have focused on false self-employment, the lack of social protection, algorithms that decide on working conditions, and the inability to exercise collective rights.

On December 9, 2021, the European Commission proposed to the European Parliament a draft directive (European Commission, 2021). This draft directive is aimed at the legal regulation of labour relations on digital platforms. It must be said that this is the first legal initiative with a comprehensive regulation at the national level. This legal initiative, undertaken by the legislative and law enforcement institutions of the European Union, aimed to take measures to ensure the legal status of the employee in the legal work relationship created by digital platforms. Both of them aimed to guarantee the principle of justice, transparency, and accountability in the algorithmic management of the working relationship through digital platforms. That solved the regulation of the labour relationship in the digital platforms as a whole, including awareness, proper information of each party involved in this labour relationship, the implementation of rules, and the creation of appropriate standards to guarantee respect for workers' rights (De Stefano et al., 2021). The draft directive outlines a set of rights that will benefit workers engaged in non-standard forms of employment, rights that derive from existing labour law guarantees, as well as other rights in the context of the digital economy.

This legal proposal was based on three main objectives: first, establishing a legal presumption of the existence of an employment relationship; second, establishing rules for the transparency and oversight of algorithmic management; and third, strengthening the monitoring and enforcement capabilities of national authorities.

The definition of platform work is outlined in Article 2(1) of the Commission's 2021 proposal, as follows (European Commission, 2021):

> *Digital job platform" means any natural or legal person that offers a commercial service that meets all of the following requirements*:
>
> *a) is provided, at least in part, remotely via electronic means, such as a website or a mobile application;*
>
> *b) is offered at the request of a recipient of the service;*
>
> *c) includes, as a necessary component, the organization of work performed by individuals, regardless of whether that work is performed online or in a specific location.*

Article 2(4) of the Commission's 2021 proposal defines the subject of the employment relationship and who is considered a platform worker. It states that a platform worker is "*any person*

performing platform work who has an employment contract or is in an employment relationship, as defined by law, collective agreements or practice in force in the Member States, taking into account the case law of the Court of Justice." Furthermore, Article 2(1) and (3) distinguish between "*persons performing platform work*" and "*platform workers*." The term "*persons performing platform work*" refers to any individual who performs work through a platform, regardless of the legal or contractual nature of the relationship. In contrast, the term "*platform workers*" refers specifically to those individuals who have an employment contract or are deemed to be in an employment relationship, as determined by national law, collective agreements, or practice, in line with the case law of the Court of Justice. Regarding the classification of whether a person working on a digital platform is to be considered an employee or self-employed, the draft Directive proposes that where the platform exercises control over the performance of work and the working conditions, the individual should be considered an employee. However, this formulation allows for a broad and potentially inconsistent interpretation, which is not exhaustive. The legal qualification of a person as an employee is of critical importance, as it triggers entitlement to the full range of labour rights. Article 4(2) of the draft sets out several conditions, and fulfilling at least two of them is sufficient for a platform worker to be presumed to have employee status under this legal framework (European Commission, 2021a):

a. *It effectively defines, or sets upper limits on, the level of remuneration;*
b. *Requires the person performing the work on the platform to comply with specific binding rules regarding the appearance and behaviour towards the recipient of the service or the performance of the work;*
c. *Supervises the performance of work or verifies the quality of work results, including electronic means;*
d. *It effectively limits the freedom, including sanctions, to organize one's work, in particular, the freedom to choose working hours or periods of absence, to accept or refuse assignments, or to use subcontractors or substitutes;*
e. *It effectively limits the ability to build a client base or perform work for any third party.*

These are the criteria that determine whether a legal relationship of work exists on a digital platform. The draft directive stipulates that if only two of the above criteria are met in such a work relationship, it will be presumed that a work relationship exists. Therefore, this presumption can be rejected if only one or none of the criteria apply, or if the employment agreement does not constitute an employment relationship under the laws of a Member State, taking into account the case law of the CJEU (Buendia Esteban, 2023). In the opposite case, if this criterion is not met, the burden of proof to prove that we are not really in the conditions of a working relationship is also supported by the digital platform in article 5 of the draft directive. Article 5 of the draft directive also provides that even in cases where the employee raises claims that we are not facing an employment relationship, the digital platform is again charged with helping in the proper resolution of the procedures, especially by providing all the relevant information it holds.

However, the process of adopting this directive encountered considerable resistance from some member states and interest groups, particularly on the issue of automatic classification as employees, which was perceived as a threat to the flexibility and innovation of platforms (European Parliamentary Research Service [EPRS], 2022). After lengthy and tense negotiations between the Commission, Parliament, and Council, a political agreement was finally reached and Directive (EU) 2024/2831 was adopted on 24 April 2024, entering into force in May of the same year. It marks a historic turning point in the regulation of new employment relationships in the EU, combining the need for social guarantees with the preservation of an innovative climate for digital platforms. The Directive maintains the essence of the draft, but has been modified on several key

points to balance the interests of the parties better. Among them, objective criteria for assessing the employment relationship were established, the role of social partners was strengthened, and more powers were delegated to Member States to adapt the implementation to their national contexts. This period, 2021–2024, demonstrates not only technological developments in the labour market but also the adaptive capacity of European labour law in the face of a new reality.

3. KEY DIFFERENCES BETWEEN THE DRAFT DIRECTIVE AND THE FINAL PLATFORM WORK DIRECTIVE (EU) 2024/2831

The process from the European Commission's proposal for the adoption of a draft directive to the adoption of the 2024 Directive represents a delicate negotiation between the need to improve working conditions for digital platform workers and the concerns of Member States regarding the regulation of all the challenges of digital work. While the draft proposal aimed to create a uniform legal framework with clearly defined criteria, especially for determining the legal status and regulating algorithmic management, the Directive adopted a new approach, allowing Member States more discretion in drafting national legislation and providing a long timeframe for transposition, allowing it to be done gradually. The paper aims to compare the structures of both legal acts, highlighting their approaches to the main pillars of work on digital platforms, such as legal presumption, algorithmic management, trade union rights, and the role of member states in the transposition of the directive into national law.

Regarding the presumption of employment status, the draft directive proposed a direct legal presumption of employment if at least 2 out of 5 criteria set by the Commission are met. Regarding the burden of proof, it shifted the burden of proof to the platform to prove whether it had an employment or service relationship with its employees. The Directive supported the principle of legal presumption, but allows more flexibility for Member States to determine the criteria for its application, according to national conditions. The burden of proof remains with the platform, but the application is not automatic. Additionally, in determining the employment status, the control and direction that the platform had over the workers would be verified in each case. But the Directive did not propose any specific criteria as to which actions of the platform would be immediately considered an exercise of control or direction. This remains at the discretion of the Member States.

The legal freedom of the Member States will lead to more confusion and a lack of legal unity. When the control and direction exercised by the platform over digital platform workers is proven, they should automatically be classified as employees; this presumption is rebutted, and the platform is charged with proving the opposite. Members are obliged to ensure that this presumption is effectively applicable both in administrative proceedings and in those judgments. In the same clear legal points, it is up to the decision-maker to decide whether we are faced with an employment case or not. Article 5 does not establish a mandatory determination of employment status, but rather a procedural mechanism that shortens the path to recognition of the imposed sentence by setting the stage for examining the relevant law in each Member State. This is a balance between the principles of subsidiarity and the harmonisation of social protection at the European Union level (Aloisi et al., 2023).

Regarding algorithmic management, the draft directive was the first legal act to recognize it as a concept and to treat it legally. The draft directive aimed to increase transparency regarding algorithms that impact the employment, salary, and evaluation of employees. The draft directive also provided the right to information and human oversight of automated decisions, while the directive

further strengthened the obligation to inform employees about algorithms, extending its application to self-employed workers. The directive not only provided for the right to information but, above all, sanctioned the need for human supervision and the right to clarification after automated decisions (European Trade Union Institute, 2024).

Employees of digital platforms have the right to appeal any automated decision, and this appeal should be reviewed by a human being, not automatically. The provision of such a legal framework is crucial in today's times to create a safe working environment and implement the principle of decent work in the digital age. The directive also provided protection for the personal data of employees on digital platforms, highlighting that the GDPR is insufficient to protect the personal data of digital platform employees (Aloisi et al., 2023). As a result, member states are obliged to provide more specific rules in their national legislation aimed at protecting personal data in digital working conditions. Therefore, we note that the directive has had a more comprehensive approach in regulating algorithmic management.

The draft directive reaffirms the right to representation and participation in collective bargaining. Still, it does not provide detailed measures for the practical implementation of this right in the context of platforms. There is no precise legal provision to guarantee the right to organize in a fragmented employment relationship. The lack of a specific legal norm makes this right ineffective. While the directive provides for the right to organize, it accompanies it with concrete and effective provisions. The directive guarantees the right of platform workers to form or join representative organizations and to participate in collective bargaining, regardless of their status (employee or self-employed). This legal provision has broken the traditional rules of labour law, attributing the right to organize only to employees. In line with technological changes and the presence of bogus self-employment, this legal provision is necessary. The directive also provides for sanctions in cases of discrimination or prohibition from being part of existing trade union organizations, and obliges member states to take all necessary measures to ensure that digital platform employees enjoy trade union rights and collective representation. For the first time, the right to collective representation has been linked to algorithmic management, ensuring access to data and transparency for representative organizations, allowing them to protect the interests of their employees (European Commission, 2021).

The draft directive aimed to unify the legislation of all member states, rather than leaving them with significant power to draft new rules for work on digital platforms. The directive provides greater flexibility to member states in implementing and adapting the provisions of the directive within their national legislation. Taking into account the national specificities of the labour market, the directive left it to the discretion of member states to regulate work on digital platforms in a more specific way. It remains to be seen what member states will propose in their national legislation and whether confusion and cases of abuse of the employment status of digital workers will increase, or whether member states will follow each other's example in drafting legislation.

4. THE CHALLENGES FACING MEMBER STATES IN THE PROCESS OF TRANSPOSING DIRECTIVE (EU) 2024/2831

The transposition of Directive (EU) 2024/2831 on improving working conditions on digital platforms poses several challenges for EU Member States. This directive requires not only the adaptation of the legal framework for work, but also a new approach to technology, employment relations, and the protection of personal data. Among the main challenges for EU Member States is the provision of clear rules that should carefully predict who will be considered an employee of all digital platform workers.

Although the Directive refers to management and control as indicators for determining employment status, it does not define the material criteria of this relationship in detail**.** The legal provision regulating employment status should be drafted in such a way as to be based on a reversal of the burden of proof (European Commission, 2021). This will entail a review of national labour and social security legislation, as well as a change in procedural law to include this burden of proof mechanism in judicial or administrative proceedings (Aloisi et al., 2023). About algorithmic management, given that everything is new and unknown, this legal provision may find member states unprepared to provide the necessary technical capacity to control algorithmic management systems on platforms (De Stefano, 2016). Many member states may not yet have a technologically developed infrastructure to oversee algorithms and automated systems that manage workers. Another difficulty is that many states may not have the capacity to provide workers with the necessary tools to request information on the algorithms that affect them.

The transparency of algorithms means that workers should be able to understand and assess their impact on performance evaluation, the tasks assigned to them, and the opportunities for improvement. Without the necessary capacity to provide this, states may face gaps in legal aid and worker protection (European Commission, 2023). The protection of personal data under the General Data Protection Regulation (GDPR), but in the context of digital platforms, will face difficulties for EU member states. Member states face difficulties in balancing the need to protect workers' privacy with the requirement to monitor workers' performance and behaviour (European Union Agency for Fundamental Rights, 2024). Algorithms that monitor work activities may breach GDPR rules if they use data without obtaining proper consent or for purposes that are not clear and specified.

Work on digital platforms is characterized by flexibility, which can sometimes lead to difficulties in guaranteeing the right to organize and collective bargaining. Platform workers are often geographically dispersed, which hinders their organization. There are also other factors, such as the platforms themselves taking measures to prevent workers from organizing, or in other cases, they are afraid to organize (De Stefano & Aloisi, 2018). States are responsible for taking all appropriate legal steps to guarantee these workers the right to organize, to negotiate, to conclude collective agreements, and to have decent working conditions. Another important challenge that countries will face is the establishment of appropriate administrative mechanisms for monitoring in practice the legislation that guarantees the rights of digital platform workers. Establishing an inspectorate, providing qualified personnel, to implement and continuously monitor the implementation of administrative responsibilities for the supervision of platforms. Establishing supervisory structures requires significant investments in technological infrastructure, training for inspectors, and providing ongoing support to ensure the platform complies with legal requirements.

5. CONCLUSION

The legal development from the Draft Directive of 2021 to the adoption of the EU Directive 2024/2831 reflects not only the challenges faced by the legal bodies of the European Union, but also the challenges faced by legislation with technological developments. While the Draft Directive laid the first foundations with concrete proposals to protect the rights at work of digital platform workers, the Directive chose to provide for a legislative framework with a more flexible, more balanced character, seeking to build national sovereignty and the innovation brought by the digital economy.

The directive is the first legal act that focused on regulating rights under the influence of algorithmic management and expanding trade union rights for platform workers, marking a change of

fundamental importance to regulate the legal relationship of digital work. However, the real impact of the directive will depend on whether Member States implement it effectively and whether they will be able to address the ongoing risks posed by misclassification for the legal status of workers.

In conclusion, the Directive represents an important milestone in the approximation of social rights in a digital economy, but its success will always require the political will of member states and social dialogue.

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Review Paper

A Comparative Analysis of Online Content Regulation in EU and UK

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Abstract: *An important aspect of daily activity occurs in cyberspace, where individuals access numerous online platforms and benefit from the various services offered. The amount of online content is growing exponentially, and at the same time, it has increased the possibility that users face illegal and harmful content on different online platforms. Relevant organizations and governing bodies indicate that individual reports of illegal and harmful content have increased every year. This shows the inadequacy of actions by online platforms in tackling illegal and harmful online content and the need to change from a self-regulation approach to a more strict governmental regulatory approach. This paper provides an overview of online content regulation applied within the European Union, Germany and the United Kingdom and through a comparative analysis of these acts, similarities and differences are identified.*

Keywords: *Online Content, Regulation, Online platforms, Illegal content, Digital services act, Network enforcement act, Online safety act.*

JEL Classification: K23 · K38 · L86 · L51

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1. INTRODUCTION

Cyberspace ecosystem consists of many online platforms that offer a multitude of services. According to the International Telecommunication Union (2023), approximately 67% of the world's population or 5.4 billion people, are connected to the Internet. Especially in Europe, this percentage reaches 91% of the population. As a result, online content is increasing every minute, and internet users interact with new content at every moment. Based on information gathered by LocaliQ (Marino, 2023), in an internet minute in 2023, 66,000 photos and videos are shared on Instagram, 350,000 tweets are sent in X, 625 million videos are watched on TikTok and 6.3 million searches are done in Google. So, user-generated content constitutes a significant component of online content.

But, unfortunately, a lot of illegal and harmful content is placed on the internet and makes more and more people vulnerable to accessing or being accessed by this content, especially children. Almost 80% of people aged between 15 and 24 use the Internet (International Telecommunication Union, 2023). According to Internet Watch Foundation (IWF, 2023), 375,230 reports were assessed in 2022, which marks a 4% increase from 2021. The environment hosting illegal and harmful content has become highly varied. Beyond websites as the earliest traditional way, illegal and harmful content is created and hosted in different online platforms such as social networks, video-sharing platforms, search engines, online marketplaces, discussion forums, etc. At the same time, the range of illegal content has become wider, including not only copyright infringement, online child sexual abuse, but also terrorist content, hate speech, disinformation, etc.

Therefore, online content regulation is very crucial to protect individuals from illegal content and harm. This is actually not something new, but the approach to regulating online content has changed. In this context, there is a wide-ranging global debate about whether and how illegal or harmful online content should be addressed through regulation (Ofcom, 2018; Price & Verhulst, 2000).

In the beginning of platforms, self-regulation has been seen as the best solution, but now recent figures have shown that government bodies' intervention or regulation is required in order to establish a common approach to the responsibilities of online providers to deal with illegal and harmful online content. The current "platform governance" status quo is rapidly moving away from an industry self-regulatory model and towards increased government intervention (Helberger et al., 2018, 2021). Recent publications emphasize the transition from self-regulation governed by platforms to co-regulation and the expanded application of automated moderation systems (Suzor, 2021; Kettemann, 2020; Gorwa, 2022). Although such systems represent positive progress in tackling illegal and harmful content, several studies also point to the risks of over-blocking, over-removal, and bias in algorithmic decision-making, thus highlighting concerns about procedural fairness, transparency and user rights (Kaye, 2021; Mac Síthigh & O'Dell, 2021).

For centuries, activists have struggled with the question of how and when governments should implement restrictions on free speech to safeguard individuals from content that may lead to harm (Bickert, 2020). This option is acknowledged as potentially the most invasive regulatory option, so its impact on individual freedoms has to be considered (Parti & Marin, 2013).

Regardless of the fact that there is a somewhat unified practice of what is considered illegal content, countries around the world have diverse interpretations of illegal online content and different models for regulating this content (Mifsud Bonnici & de vey Mestdagh, 2005). This paper provides an overview of different online content regulations applied in the European Union (EU), the

United Kingdom (UK), and Germany. By conducting a comparative analysis of these regulations, this paper aims to identify the strengths and weaknesses of each approach.

This paper is organized as follows. The methodology of this paper is described in Section 2. The third section of the paper explores EU regulation on tackling illegal online content. The next section examines Germany's approach on addressing illegal online content. The fifth section investigates how the United Kingdom regulates online content. In the following section, a comparative analysis of those regulations is undertaken. This analysis produces significant conclusions and findings for this paper in the last section.

2. METHODOLOGY

The authors perform a comparative analysis of regulatory frameworks addressing the issue of online content regulation in order to achieve the aim of this paper. The primary sources of data include the EU Digital Services Act, the German Network Enforcement Act and the UK Online Safety Act. Although there are other regulations on tackling illegal and harmful content, the research focuses only on the above 3 acts as they constitute the main jurisdictions based on their great impact on content regulation and the different approaches they offer within the European context, thereby providing a basis for their comparison, which is particularly relevant for countries like Albania aiming to align with EU digital policy frameworks. In order to highlight similarities and, especially, differences between these diverse jurisdictions' approaches towards online content regulation, the following research questions are identified:

RQ1. Which types of online platforms are regulated?

RQ2. Do these regulations define and categorize illegal online content?

RQ3. What obligations are imposed on online providers to enhance their accountability in content regulation?

3. EU REGULATION ON TACKLING ILLEGAL ONLINE CONTENT

EU Regulation 2022/2065 on a Single Market for Digital Services, known as the Digital Services Act (DSA), establishes a significant framework affecting European users who generate and disseminate online content as well as technology companies who serve as intermediaries on the internet. By amending the Directive 2000/31/EC on Electronic Commerce (E-Commerce Directive), DSA sets out the baseline regime applicable to all categories of intermediary services offered to recipients of the service that are located in the Union, irrespective of where the providers of those intermediary services have their place of establishment. Entry into force by 17 February 2024, the main goal of the DSA is to create a safer and more accountable digital space in which the fundamental rights of all users of digital services are protected (European Union, 2022).

It is important to mention that despite updating the EU E-Commerce Directive, DSA does not affect the application of this Directive, which continues to remain in force.

3.1. Categorization of Intermediary Service Providers (ISPs)

An important aspect related to illegal or harmful online content is the definition of the liabilities of the information society service providers, known as intermediary service providers (ISPs). The

DSA regulates the liability regime of ISPs. Based on this regulation, we have 3 (three) types of ISPs, whose liabilities are set out below:

Mere Conduit ISPs

Article 4 of the Digital Services Act, which explain "mere conduit", defines that if the service provided by the ISP consists of the transmission in a communication network of information provided by a recipient of the service, or the provision of access to a communication network, the ISP is not liable for the information transmitted or accessed when it: (European Union, 2022)

- does not initiate the transmission;
- does not select the receiver of the transmission;
- does not select or modify the information contained in the transmission.

Caching ISPs

Article 5 of the Digital Services Act that defines "caching", stipulates that if the service provided by the ISP consists of automatic, intermediate and temporary storage of information, in order to make the onward transmission of the information to the recipients of the service more efficient, the ISP is not liable on condition that: (European Union, 2022)

- does not modify the information;
- complies with conditions on access to the information;
- complies with rules regarding the updating of the information, specified in a manner widely recognized and used by industry;
- does not interfere with the lawful use of technology, widely recognized and used by industry, to obtain data on the use of the information;
- acts expeditiously to remove or to disable access to the stored information when information at the initial source has been removed or access has been disabled or when a judicial or an administrative authority has ordered such removal or disablement.

Hosting ISPs

As defined by Article 6 of the Digital Services Act, hosting ISPs offer the service of the storage of information provided by a recipient of the service. The service provider is not liable for the information stored by service recipients when it: (European Union, 2022)

- does not have actual knowledge of illegal activity or illegal content;
- upon obtaining such knowledge or awareness, acts expeditiously to remove or to disable access to the illegal content.

So, the regulation gives explicit provisions on the conditions and circumstances under which the ISP will be responsible for user-generated content.

The E-Commerce Directive, also known as the safe harbour framework for internet intermediaries, has been a core pillar of internet regulation for the last two decades. Since 2000, when the Directive was adopted, the online services environment has been changed with the introduction of search engines, social media platforms, video-sharing platforms, the rise of mobile and cloud computing, etc. So Article 14 of the E-Commerce Directive applies to a greater number of services than was thought in 2000 (Van Hoboken et al., 2018). As a result, the Digital Services Act, compared to the Directive, brings a new categorization for the largest platforms, by introducing the terms of Very Large Online Platforms (VLOPs) and Very Large Online Search Engines

(VLOSEs). These are online platforms and online search engines that have a number of average monthly active users in the EU equal to or higher than 45 million. They are subject to stricter additional obligations based on their size and important role in the digital environment. The European Commission is the responsible entity to designate a platform as a VLOP or a search engine as a VLOSE based on user numbers provided by platforms and search engines by 17 February 2023. As of now, platforms such as AliExpress, Amazon Store, App Store, Pornhub, Booking.com, Google Play, Google Maps, Google Shopping, YouTube, LinkedIn, Facebook, Instagram, Pinterest, Snapchat, Stripchat, TikTok, X, Wikipedia, XVideos, and Zalando are categorized as Very Large Online Platforms (VLOPs). Additionally, Google Search and Bing have been designated as Very Large Online Search Engines (VLOSEs).

3.2. Obligations for Online Providers

The Digital Services Act (DSA) sets out a complete set of obligations on online providers to increase their transparency, security and accountability in the digital space. In the table below, the main obligations are listed and properly assigned to various categories of online providers. The DSA includes four major categories of online providers: intermediary services, hosting services, online platforms and very large online platforms and search engines. It is important to mention that in our analysis, other obligations specified in the DSA, which are not closely related to the issue of tackling illegal and harmful internet content, are excluded.

As shown in the table 1, online platforms, especially very large online platforms and very large online search engines, have the largest number of liabilities to be addressed and to be compliant with the DSA requirements. This proves their essential impact in the online ecosystem.

Table 1. A Taxonomy of regulatory obligations based on different types of online platforms

Obligations	Intermediary services	Hosting services	Online platforms	VLOPs/ VLOSEs
Act against illegal content upon the receipt of an order	×	×	×	×
Inform the recipient of the service affected regarding the reasons for removal and the possibilities for redress that exist	×	×	×	×
Provide specific information about one or more specific individual recipients of the service upon the receipt of an order	×	×	×	×
Designate a single point of contact for authorities	×	×	×	×
Establish a single point of contact for users of the service	×	×	×	×
Apply policies, measures and tools used for content moderation	×	×	×	×
Publish at least once a year, clear reports regarding content moderation performed	×	×	×	×
Put mechanisms in place to allow any individual or entity to notify them regarding potentially illegal content on their service		×	×	×
Provide a clear and specific statement of reasons to any affected recipients of the service for any restrictions related to illegal content		×	×	×
Inform the authorities of its suspicions of criminal offences		×	×	×

Provide users with access to an internal complaint-handling system			×	×
Inform recipients of the service about the possibility of an out-of-court dispute settlement			×	×
Give priority and process notices submitted by trusted flaggers			×	×
Suspend for a reasonable period of time the provision of their services to recipients that frequently provide manifestly illegal content			×	×
Put in place appropriate measures to ensure the online protection of minors on their service			×	×
Conduct a risk assessment related to the dissemination of illegal content through their services				×
Maintain a crisis response mechanism				×
Be subject, at their own expense and at least once a year, to independent audits				×
Establish a compliance function to monitor compliance with the DSA				×
Be charged annually a supervisory fee for each service				×

Source: Own processing

4. GERMANY'S APPROACH TO ADDRESSING ILLEGAL ONLINE CONTENT

Germany has adopted one of the most robust state–level regulatory frameworks regarding illegal online content, with a particular emphasis on combating hate speech. The German Network Enforcement Act (NetzDG) was adopted in June 2017 and entered into force on 1 October 2017.

4.1. Scope of the NetzDG

This act applies to all social networks that enable users to share any content with other users or to make such content available to the public, if the social network has more than two million registered users in the Federal Republic of Germany (Germany, 2017). This means that social networks or platforms that have fewer than two million registered users are outside the scope of this act. Also, online platforms intended for journalistic and editorial content and online platforms intended for the dissemination of specific content, such as online gaming platforms, professional social networks and online sales platforms, are exempt from the obligations of this act. In order to determine which illegal content is covered by this law, the NetzDG refers to 22 offences of the German Criminal Code, which include child sexual exploitation and abuse material, xenophobic, racist and other types of hate speech, terrorist content, content infringing intellectual property rights and online disinformation (De Streel et al., 2020).

4.2. Responsibilities of Online Platforms

With regard to reporting illegal online content, online platforms must ensure an effective and transparent procedure for handling complaints about unlawful content that needs to be easily recognisable, directly accessible and permanently available for users. After receiving the complaint, the online platform checks whether the content is illegal or not and whether blocking or removal procedures will be applied. The online platform has 7 (seven) days to remove or block access to the illegal content. This time limit is reduced to 24 hours in case of manifestly illegal content,

unless there is an agreement between the online platform and the competent law enforcement authority on a longer period for blocking or removal.

Another important obligation in this act is that the online platform must notify the complainant and the author of the content about its decision, while also providing them with the reasons on which this decision is based. In the case of removal, the online platform is obliged to retain the content as evidence and store it for this purpose for a period of ten weeks.

Online platforms are also obliged to appoint a representative in Germany to deal with requests or notices for information. Another special provision included in the act is that online platforms that receive more than 100 complaints per year about illegal content are obliged to produce reports every 6 (six) months on the handling of complaints regarding illegal content on their platforms.

4.3. Concerns Related to Freedom of Expression

Supporters see the act as a necessary tool in order to reduce or stop hate speech online and extremism. On the other hand, critics view it as a German "Censorship Law", in the sense that forcing social media platforms to block or remove illegal content may sometimes result in a violation of free speech on these platforms. First, they argue that the law may lead to over-blocking as the sanctions are asymmetric; the online platforms are fined if they maintain illegal content, but not when they remove accidentally legal content (De Streel et al., 2020). Second, the main fear is that social media platforms might remove more content than necessary in order to avoid being fined (Heldt, 2019). Third, the NetzDG provides few mechanisms for the author of allegedly illegal content to complain, although the act imposes an obligation on online platforms to inform them regarding the decision. There are many reasons to criticise the NetzDG, but what it does, in the end, is increase intermediary liability for not reacting to user notices concerning unlawful content (Heldt, 2019).

5. REGULATING ONLINE CONTENT IN THE UNITED KINGDOM

In the UK, the Online Safety Bill establishes a new regulatory framework to tackle illegal and harmful online content. The Bill received Royal Assent on 26 October 2023 and is now known as the Online Safety Act. The Act defines that illegal content means any content consisting of certain words, images, speech or sounds that amounts to a relevant offence (terrorism offence, child sexual exploitation and abuse offence, offence that is specified in regulations made by the Secretary of State and offence of which the victim or intended victim is an individual). Also, it defines harmful content as the nature of the content where there is a material risk of the content having, or indirectly having, a significant adverse physical or psychological impact on a human of ordinary sensibilities (United Kingdom, 2023).

5.1. Categories of Regulated Online Services

This Act applies to providers of regulated services that have a significant number of users in the UK or that are capable of being used by individuals in the UK, more specifically:

- user-to-user services, which are services that allow users to generate, upload or share user-generated content or interact with other users, for example, social media services, video-sharing services, private messaging services, online marketplaces, dating services, review services, file and audio sharing services, discussion forums, information-sharing services and gaming services.

- search services, which are services that allow users to search particular content on the internet.
- video-sharing platforms, which are online services that allow users to upload and share videos with other people.
- services with pornographic content, which include online services that publish or display certain pornographic content in the form of videos, audio or images.

Services deemed to have a low risk of harm to users, or that are otherwise regulated, including emails, SMS and MMS messages, comments and reviews on provider content, one-to-one live audio communications, paid-for advertisements, and news publisher content, are exempt from the obligations.

5.2. Liabilities for Providers of Online Services

The Online Safety Act defines a set of obligations and duties to be met by regulated content providers to protect users from illegal and harmful online content. According to the Act, online platforms or providers need to take care of the following duties: (United Kingdom, 2023)

- to carry out an illegal content risk assessment and to keep it up to date;
- to minimise the presence and dissemination of priority illegal content;
- to minimise the length of time for which priority illegal content is present;
- where the provider is alerted by a person to the presence of any illegal content, or becomes aware of it in any other way, swiftly takes down such content;
- to produce an annual report regarding the handling of complaints about illegal and harmful online content on their platforms;
- to specify in the terms of the service how individuals are to be protected from illegal content. Those terms of service need to be clear, accessible and applied consistently.

Beyond the duties defined above, the Act puts particular duties for services likely to be accessed by children. They need to:

- prevent children of any age from encountering, by means of the service, primary priority content that is harmful to children;
- protect children in age groups judged to be at risk of harm from other content that is harmful to children.

6. Comparison of the EU Digital Services Act, Germany's NetzDG, and the UK Online Safety Act

These online content regulations are generally similar to each other as they impose strong obligations and duties on online platforms that are under their scope. The table below provides a comparative analysis of these three significant legislative acts based on several key criteria.

In terms of scope, the German NetzDG applies to a narrower range of online platforms compared to the other two regulations. By restricting to social networks only, this act excludes sales platforms and messenger services. In contrast, both the EU Digital Services Act and the UK Online Safety Act include these types of online services. The EU DSA and the UK OSA apply to a broader and almost identical range of online platforms. Another notable difference is that the German NetzDG and the EU DSA categorise online platforms based on the number of users in the territory where each regulation is applied, whereas the UK OSA does not have explicit categorisation criteria related to the number of users.

Table 2. Comparative Overview: EU Digital Services Act, German Network Enforcement Act, and the UK Online Safety Act

Criteria	EU	Germany	UK
	Digital Services Act	**NetzDG**	**Online Safety Act**
Categories of online platforms	• intermediary services • hosting services • online platforms • very large online platforms/very large online search engines	Social networks with more than 2 million registered users in Germany	• user-to-user services • search services • video-sharing platforms • services with pornographic content
Definition and Type of Illegal content Obligations	Any information that, in itself or in relation to an activity, is not in compliance with Union law or the law of any Member State which is in compliance with Union law No categorisation of its types	No definition of what constitutes illegal content, and no categorisation of its types	Any content consisting of certain words, images, speech or sounds that amounts to a relevant offence (terrorism offence, child sexual exploitation and abuse offence, offence that is specified in regulations made by the Secretary of State and offence of which the victim or intended victim is an individual)
	• Content moderation/ removal • Terms and conditions • Provide information about specific users • Designation of a single point of contact for authorities/users • Transparency reporting obligations • Mechanisms for users to notify about illegal content • Statement of reasons • Internal complaint-handling system/out-of-court dispute settlement • Trusted Flaggers • Suspension of users from service • Protection of minors • Risk Assessment • Independent audits • Compliance function	• Content removal • Terms and conditions • Provide information about specific users • Designation of a representative in Germany • Transparency reporting obligations • Establishment of an effective procedure for reporting illegal content. • Statement of reasons • Complaint management system • Storage of removed content as evidence for ten weeks	• Content moderation/ removal • Relevant Terms of Service /Terms of Use • Provide information about specific users • Transparency reporting obligations • Mechanisms for users to notify about illegal/ harmful content • Transparent decision-making over actions taken in response to reports of harms • Effective internal complaint mechanisms. • Suspension of users from service • Protection of children • Risk Assessment • Audits • User Identity Verification
Reaction time	No specific time frames defined	• Removal of manifestly illegal content within 24 hours. • Removal of illegal content within seven days.	No specific time frames defined
Penalties for non-compliance	Up to 6% of the provider's annual worldwide turnover	Up to €50 million	Up to £18 million or 10% of a provider's annual global revenue, whichever is highest

Source: Own processing

Regarding the definition and types of illegal content, the UK OSA provides in-depth specifications for defining what constitutes illegal content and its various types. On the other hand, the EU DSA and the German NetzDG lack clear in-text provisions for defining illegal content types. However, different categories of illegal content in the EU are regulated by other laws.

Additionally, the German NetzDG refers to the German Criminal Code for the categorization of illegal content and offenses. Another important difference to note is that the UK OSA is the only regulation that directly addresses harmful content.

As for the liabilities imposed on online platforms, the EU DSA and the UK OSA contain a broader and more rigorous set of obligations compared to the German NetzDG. An important distinction has to do with the approach to how these acts regulate illegal content. Both the EU DSA and the UK OSA mandate content moderation and removal, whereas the NetzDG only refers to the removal process and does not require any content moderation activity. Furthermore, the UK OSA requires platforms to proactively monitor and moderate all content to identify illegal and harmful content. Meanwhile, the EU DSA does not have a general obligation for providers to monitor content, as it operates based on a "notice and action" mechanism. In contrast to the EU DSA, the German NetzDG and the UK OSA do not provide redress rights for ordinary users, nor do they contain procedures to escalate complaints through out-of-court or in-court resolutions. While both the EU DSA and the UK OSA emphasise child protection, the UK's OSA imposes a wider range of strict obligations related to measures for minors. It is also important to mention that the EU DSA uniquely implements a system of trusted flaggers, which are entities recognised for their particular expertise in detecting, identifying, and reporting illegal content.

Regarding reaction time, the German NetzDG has specific time frames defined, requiring the removal of illegal and harmful content within seven days and 24 hours in the case of manifestly illegal content. On the other hand, the EU DSA and the UK OSA do not have specific time frames and are limited to using terms such as 'swiftly' or 'promptly' related to illegal content removal, without defining what these terms precisely involve in terms of exact hours or days.

7. CONCLUSION

Online content regulation has gained high importance as reports of illegal and harmful content have increased. Deregulation and self-regulation proved insufficient and ineffective in addressing the various concerns of users, organizations, and authorities. Consequently, regulations implemented and enforced by governmental bodies have been seen as crucial in reshaping online safety, which is threatened by new types and forms of illegal content.

This paper examined three key regulations: the EU Digital Services Act, the German Network Enforcement Act, and the UK Online Safety Act. These acts jointly address the issue of illegal content and establish a clear regime of obligations for online platforms. Regardless of their common goal, they each have unique characteristics and differ from one another.

The EU Digital Services Act establishes a common approach across Member States by regulating a wide range of online platforms. The UK Online Safety Act is the only regulation that focuses on harmful content, particularly concerning children. While the EU Digital Services Act proposes a more reactive approach, the UK Online Safety Act imposes a more proactively approach. The German Network Enforcement Act places emphasis on content removal as it mainly targets hate speech on social networks.

These regulations have triggered concerns about their possible negative implications for the freedom of expression on online platforms. Therefore, it is imperative that content regulation processes must be transparent, trustworthy and reasonable to guarantee the right balance between online safety and free speech.

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