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Research Article

DIGITAL TRANSFORMATION CHALLENGES IN SERBIAN AND HUNGARIAN SMES: AN INDEX-DRIVEN COMPARATIVE ASSESSMENT

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Abstract: Despite ongoing EU Digital Decade ambitions, small and medium-sized enterprises (SMEs) in Central and Eastern Europe face persistent barriers to digital adoption, including technological complexity, high costs, organizational resistance to change, and digital skills shortages. Drawing on secondary data from the Digital Economy and Society Index (DESI), Eurostat Digital Intensity Index (DII), ICT Usage in Enterprises surveys, and the IMF AI Preparedness Index (AIPI), this paper provides a comparative assessment of digital transformation in Hungarian and Serbian SMEs. Analysis reveals that Hungary demonstrates moderate progress — cloud adoption at 38.85%, AI uptake at 6.97%, and basic digital skills at 58.89% — while Serbia shows a declining trend in digital skills (33.6%, 2023) and minimal AI adoption (1.8%), yet unexpectedly high SME e-commerce engagement (28.4%). Both countries exhibit mixed attitudes to digitalization and sector-specific challenges, with organizational culture and government support emerging as critical contextual factors alongside the index-based gaps. Grounded in Marketing 5.0 principles, the study proposes human-centric digital strategies and identifies an index-derived baseline for future primary research and policy interventions.

Keywords: Digital transformation, Serbia-Hungary SMEs, Digital Intensity, AI adoption, organizational culture, Marketing 5.0

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1. INTRODUCTION

Digital transformation — the strategic integration of digital technologies into business processes to enhance competitiveness, efficiency, and customer value — is a defining imperative for SMEs across Europe (OECD, 2021). In Hungary and Serbia, SMEs constitute over 99% of enterprises and provide the majority of employment (Horváth, 2023; OECD, 2021; Statistical Office of the Republic of Serbia, 2024, 2025). Hungary, as an EU member state, benefits from European Digital Innovation Hubs (EDIHs) and Recovery and Resilience Facility (RRF) grants, while Serbia, as an EU candidate country, increasingly aligns its digitalization agenda with EU Digital Decade 2030 targets under a less comprehensive institutional framework (Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 Establishing the Digital Decade Policy Programme 2030 (Text with EEA Relevance), 2022; European Commission, 2024).

Research consistently identifies a paradox in both countries: despite growing awareness of digital tools, actual strategic deployment remains limited. Endrődi-Kovács and Stukovszky (2022) documented low actual adoption of advanced technologies among Hungarian SMEs, constrained by investment uncertainty and absent digital leadership. Jankulović and Kovačević (2025) found analogous dynamics in Serbia, where technology acceptance and digital readiness are determined jointly by business sector, financial capacity, operational factors, and existing strategy. Critically, both countries face not only technical barriers but cultural ones: Saáry et al. (2022) showed that Hungarian SMEs cluster into distinct groups based on their orientation toward digitalisation and sustainability, while Damnjanović et al. (2025) identified three adoption types among Serbian firms — Traditionalists, Experimenters, and Strategic Adopters — each requiring different policy interventions.

This study bridges the gap through a structured secondary analysis using a multi-index framework: DESI, Eurostat DII (ISOC_E_DII), ICT Usage in Enterprises (ISOC_EB_AI, ISOC_EB_BD, ISOC_EC_EBUYN2), and the IMF AIPI (Cazzaniga et al., 2024; European Commission, 2025b, 2025a; eurostat, 2026; IMF, 2026b, 2026a). The paper is theoretically grounded in Marketing 5.0, which frames digital strategy around human-centricity — empathy, creativity, and personalised value — directly relevant to SMEs whose competitive advantage rests on customer relationships rather than scale (Kotler et al., 2021).

The paper is structured as after the literature review on digital transformation in SMEs, marketing 5.0 frameworks is discussed. Then the data and methodology of the secondary data research and the results are presented with conclusions and possible future research directives.

2. LITERATURE REVIEW

2.1. Digital Transformation in SMEs: Concepts, Barriers, and Cultural Factors

Digital transformation requires a fundamental re-orientation of processes, culture, and value creation, not merely isolated tool adoption (OECD, 2021). For SMEs, capital constraints, skills gaps, and fragmented support access are the primary structural barriers. Horváth (2023) confirmed these dynamics in a survey of Hungarian SMEs, finding that while ICT infrastructure motivates adoption, advanced Industry 4.0 elements — AI, cloud platforms, data analytics — remain peripheral, constrained by investment uncertainty and absent digital leadership. Szennay and Csákné Filep (2024) further demonstrated that the COVID-19 pandemic accelerated certain digital experiments in Hungarian entrepreneurship, particularly e-commerce and remote work,

but post-pandemic consolidation revealed shallow digital foundations: many enterprises reverted to pre-crisis behavior once restrictions lifted.

Organizational culture and resistance to change constitute a distinct and underappreciated barrier. Varbanovaa et al. (2023), in a survey of 124 SMEs across six Central Eastern European (CEE) countries including Serbia, identified five strategic factors for Industry 4.0 implementation — Leadership, Management Strategy, Organizational Culture, Business Environment, and Circular Economy — with statistically significant differences between manufacturing and agri-food sectors. Their findings indicate that leadership capacity and cultural readiness are as decisive as technical and financial readiness. Saáry et al. (2022) similarly demonstrated, through a comparative study of Hungarian and Slovakian SMEs, that digitalization outcomes reflect not only resource availability but strategic orientation: SMEs divide into groups of profit-driven and sustainability-oriented adopters, each with distinct digitalization pathways. The "digitainability" concept — the integration of digitalization and sustainability — that Saáry et al. (2022) and Tick et al. (2022) explored in V4 countries including Serbia, further shows that digital and green agendas are not automatically aligned and require intentional managerial bridging. A companion study by Tick et al. (2022), surveying 635 SMEs across V4 countries, Serbia, and Bulgaria through the lens of the "digitainability" concept, confirmed two stable clusters — Concerned-Inspired firms that actively embrace both digitalization and sustainability, and Indifferent Conservatives sceptical of both trends — and found that this division is independent of firm size, sector, and age, indicating that strategic orientation rather than structural characteristics is the decisive predictor of SME digitalization readiness.

2.2. Government Support: Active but Insufficiently Effective

Government support plays a critical but imperfectly realized role in both countries. In Hungary, Endrődi-Kovács and Stukovszky (2022) acknowledged active government initiatives — the EDIH network (European Commission, 2024), DIMOP funding (Hungarian Government, 2026), and digital literacy programmes — but found their effect on SME adoption statistics to be limited and not yet reflected in DESI indicators. Szennay and Csákné Filep (2024) confirmed that governmental backing influenced motivation for digitalization in the pandemic period, yet structural change in business models was uncommon. For Serbia, Jankulović and Kovačević (2025) found that SMEs require more robust institutional frameworks: their case studies of six Serbian SMEs reveal that digitalization readiness is sector-specific and that access to tailored government programmes — particularly for technical and operational-process support — is more impactful than generic funding schemes. Stojanovska-Stefanova et al. (2025) add that for AI specifically, a multi-stakeholder approach encompassing government, educational institutions, and industry is required to move Serbian SMEs from awareness to operational implementation. Applying structural equation modelling to 134 Serbian enterprises, Milošević et al. (2022) found that while external limitations — including connectivity, access to service providers, and external funding — significantly constrain Industry 4.0 performance outcomes, internal limitations such as knowledge gaps and motivation deficits do not, because a positive managerial attitude toward digitalization effectively neutralises them; this implies that mindset-oriented interventions may be more tractable than resource provision for Serbian SMEs at the current stage of digital maturity.

2.3. Sector-Specific Challenges and SME Typologies

Sectoral heterogeneity is a recurring finding across the literature. Varbanovaa et al. (2023) documented significant differences in Industry 4.0 adoption factors between manufacturing and agri-food SMEs across CEE, with agri-food digitalization lagging substantially behind manufacturing due to higher capital intensity and lower digital awareness. Miskic et al. (2025), in a Serbian case study, identified that SMEs in tourism and hospitality face particularly high barriers: digital tool costs are disproportionately high relative to revenue, infrastructure is insufficient, and awareness of available support is low. Damnjanović et al. (2025) provide the most granular typology for Serbian SMEs: Traditionalists (majority, relying on reactive planning and minimal data use), Experimenters (deploying specific digital channels opportunistically), and Strategic Adopters (tight AI-strategy alignment, strong sustainability orientation). This typology is consistent with what Tick (2023) found in their comparative study in V4 countries, Serbia and Bulgaria, where over 52% of SMEs were unfamiliar with the term Industry 4.0 — Serbia ranking roughly mid-table behind Czech Republic and Slovakia but above Bulgaria.

2.4. Marketing 5.0 as Theoretical Framework

Kotler et al. (2021) define Marketing 5.0 as the application of human-mimicking technologies to create, communicate, deliver, and enhance value across the customer journey, insisting that technology must serve human ends. Applied to the CEE SME context, Marketing 5.0 provides a normative direction: instead of isolated tool adoption, SMEs should build toward AI-enabled customer analytics and personalized engagement — precisely the capabilities the index data show are weakest. The framework also provides a management logic for the typology identified by Damnjanović et al. (2025): Experimenters are positioned at the Marketing 5.0 entry point, while Strategic Adopters demonstrate the full integration the framework prescribes.

Among the internal corporate indicators of the spread of digitalization, in addition to the previously mentioned corporate culture, management and employee attitudes toward digitalization, and corporate structure, marketing is of paramount importance, serving as a bridge between external consumer expectations and internal strategic planning (González-Ferriz, 2022). Marketing 5.0 offers a framework to meet this evolutionary need by identifying key areas and defining corporate focus.

Research in the field of Marketing 5.0 was primarily spurred by the pandemic. Scholars examined the embeddedness of the new concept at both the macro and micro levels. The macro level explored the interconnections between Marketing 5.0, Industry 5.0, and Society 5.0 (Bakator et al., 2024). According to the researchers, Marketing 5.0 bridges Industry 5.0 technologies with the human-centric goals of Society 5.0, shifting focus toward sustainability, resilience, and ethical, hyper-personalized consumer value. The findings suggest that long-term competitiveness in this new ecosystem requires integrating human touch with predictive analytics to address social challenges. At the micro, company level, research has focused, among other things, on identifying key areas (Hermina et al., 2022), and the creation of validatable scales (González-Ferriz, 2022), but several studies focus on exploring the relationships between Marketing 5.0 and industry-specific characteristics (Nogami & Senra, 2025).

Hermina and co-authors define three elements of Marketing 5.0, namely predictive (1) and contextual (2) marketing to forecast campaign results and deliver real-time, personalized interactions (3) through sensors and human-mimicking technology. This approach targets

modern consumer behavior, which is increasingly driven by the digital subculture. González-Ferriz (2022) examines the integration of Marketing 5.0 along two dimensions: marketing strategy and the incorporation of new technologies. The study analyzes how the pandemic accelerated the adoption of technology-driven marketing strategies. Using a mixed-methods approach combining literature review and comparative analysis, the study finds that while AI and digital tools boosted performance, significant gaps remain in integrating Big Data and IoT. Bakator et al. (2023) conclude that achieving competitiveness requires integrating AI, IoT, and big data to transition from simple digitization to advanced, data-driven strategies. Marketing 5.0 emphasizes a shift toward highly personalized, ethical customer interactions, utilizing predictive tools to meet evolving digital-first demands. The study highlights that success hinges on an agile culture balancing technological innovation with human capital. Their theoretical model shows that aligning technology with ethical governance (CSR) secures long-term market advantage.

Academic research and sector reports emphasize the government's responsibility regarding the digital divide, given the SME sector's vulnerability. From the perspective of this research, incorporating the Marketing 5.0 model is justified because it highlights the organic interplay of these processes. This approach is suitable for emphasizing, beyond government responsibility, that external consumer pressure and market demands are capable in themselves of boosting the digitalization process in the SME sector. It is important to note that, according to Nogami and Senra (2025), there are no ready-made solutions. Their study employed a descriptive survey of 62 companies across six sectors to analyze digital maturity, utilizing a Marketing 5.0 quadrant framework to map business and customer readiness. Findings indicate that while high-tech and financial services successfully transitioned into the "omni" quadrant of high digital adoption, healthcare and hospitality sectors lagged in the "origin" quadrant. Retailers face a specific challenge where company modernization has outpaced customer adaptation, highlighting a significant digital gap. The research concludes that environmental acceleration created uneven digital readiness, requiring tailored strategic interventions to align business technology with consumer behavior. The study underscores the necessity of a tailored, sector-specific approach to digital transformation rather than a uniform strategy across all industries.

3. DATA AND METHODOLOGY

3.1. Research Design and Data Sources

This study employs a cross-national secondary data analysis comparing Hungary (EU member) and Serbia (EU candidate). The methodology proceeds in two phases: (1) macro-level environmental diagnosis using official indices; (2) aggregation of SME enterprise metrics to establish a quantitative baseline for future primary research. SMEs are defined as enterprises with 10–249 employees per Eurostat classification. Data were retrieved between January and April 2026. Table 1 summarizes sources and indicators.

Table 1 Data sources and key indicators

Index / Dataset	Dataset code / URL	Key SME indicator(s)	Reference
DESI	https://digital-decade-desi.digital-strategy.ec.europa.eu	SME digital intensity, cloud, AI, e-selling, skills, big data	(European Commission, 2025b)
Eurostat DII	ISOC_E_DII	% SMEs basic / high digital intensity	(eurostat, 2026)
Eurostat ICT Enterprises	ISOC_EB_AI; ISOC_EB_BD; ISOC_EC_EBUYN2	AI use, big data, online sales (% enterprises)	(eurostat, 2026)
AI Preparedness Index (AIPI)	https://www.imf.org/en/home — AI Preparedness Index	AI readiness composite score (0–1)	(Cazzaniga et al., 2024; IMF, 2026a, 2026b)

3.2. Analytical Approach and Limitations

The analysis employs descriptive statistics and gap analysis — percentage-point differences between Hungary, Serbia, and the EU27 average are calculated per indicator, and trends across 2020–2025 are examined. Three limitations apply to this research: (1) Serbia's candidate-country status yields less granular DESI data, requiring partial reliance on national statistical sources; (2) index data reflect 2023–2024 surveys, introducing a 12–18-month temporal lag; and (3) aggregate secondary data cannot capture firm-level heterogeneity — the sectoral differences identified by Varbanovaa et al. (2023) and Miškić et al. (2025) cannot be fully reproduced from country-level indices alone.

4. RESULTS AND DISCUSSION

4.1. Consolidated Comparison

Table 2 consolidates key findings. Hungary shows convergence toward EU averages in cloud adoption (38.85% vs EU 38.04%) and digital skills (58.89% vs EU 55.56%), while Serbia reveals structural decline in skills (33.6% in 2023, down from 46% in 2020) and persistently low AI adoption (1.8% vs Hungary 6.97% and EU 12.64%). The most counterintuitive result is Serbia's superior e-commerce engagement with 28.4% vs Hungary's 21.27% and EU average 20.13%.

Table 2 Key SME digitalization indicators: Hungary, Serbia, and EU27 (most recent available data)

Indicator	Hungary (%)	Serbia (%)	EU27 avg (%)	Source
Basic digital skills (% pop.)	58.89 (2024)	33.6 (2023)	55.56 (2024)	(European Commission, 2025b, 2025c; Regional Cooperation Council (RCC), 2025)
Advanced digital skills (% pop.)	28.13 (2024)	11.3 (2023)	27.32 (2024)	
Cloud adoption — SMEs	38.85 (DESI 2025)	28.4 (2023)	38.04 (DESI 2024)	
AI adoption — SMEs	6.97 (DESI 2025)	1.8 (2023)	12.64 (DESI 2025)	
SMEs selling online	21.27 (DESI 2025)	28.4 (2023)*	20.13 (DESI 2025)	
SME digital intensity — at least basic	57.44 (DESI 2025)	49.2 (2023)	72.91 (DESI 2025)	
Big data use — SMEs	6.65 (2023)	2.0 (2022)**	13.64 (2023)	
AIPI score (0–1, 2023)	0.563	0.537	—	(IMF, 2026a, 2026b)
Digital Infrastructure sub-index (0–1, 2023)	0.160	0.149	—	

*Notes: *Serbia e-commerce data from Statistical Office of the Republic of Serbia (2024); methodology may differ from Eurostat. **Serbia big data 2023 value (24.8%) appears anomalous; 2022 used. SME definition: 10–249 employees.*

4.2. Digital Skills and Government Support: Diverging Trajectories

Hungary's basic digital skills rose from 49.09% to 58.89%, surpassing the EU27 average (European Commission, 2025c). Advanced skills improved similarly to 28.13% versus EU 27.32% (European Commission, 2025c). These gains reflect a sustained EDIH-driven investment trajectory in digital upskilling (European Commission, 2024). Serbia's decline — basic skills falling from 46% (2020) to 33.6% (2023), advanced from 20% to 11.3% — reflects structural brain drain and insufficient adult upskilling (Figure 1). This divergence is consistent with the finding of Endrődi-Kovács and Stukovszky (2022) that government support in Hungary, though active, has yet to deliver measurable DESI-level impact; the improvement observed here likely reflects a longer-term effect of sustained investment rather than immediate policy response. For Serbia, Jankulović and Kovačević (2025) note that sector- and firm-specific support is more effective than generic schemes — a finding that argues against the standardized programme approach that has dominated Serbian digital policy.

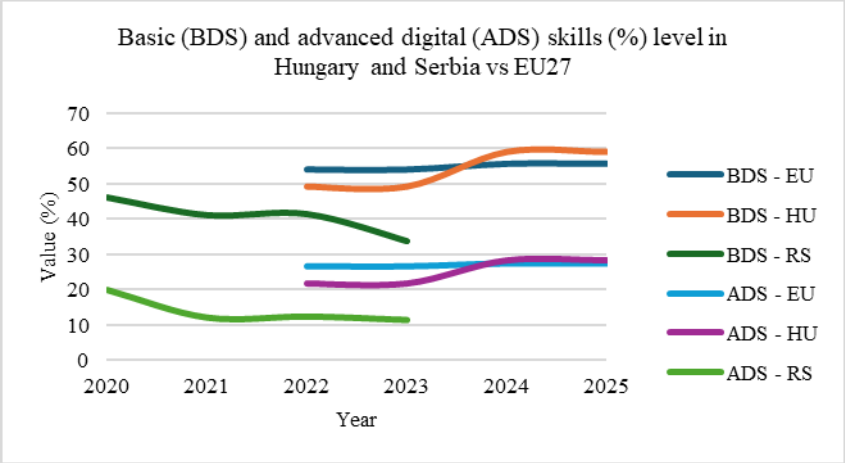


Figure 1. Basic and Advanced Digital Skills (%) for Serbia, Hungary, EU27, years 2020–2024. Source: (European Commission, 2025b, 2025c; Regional Cooperation Council (RCC), 2025)

4.3. Cloud Adoption and AI: Technology Barriers and Cultural Resistance

Hungary's cloud adoption grew from 19.77% (2022) to 38.85% (2025) (European Commission, 2025c), approaching the EU average. Serbia progressed from 15% (2020) to 28.4% (2023) but a ten-point gap persists (Regional Cooperation Council (RCC), 2025). AI adoption diverges sharply: Hungary at 6.97% (2025) versus Serbia at 1.8% (2023), both below the EU's 12.64% (European Commission, 2025c; Regional Cooperation Council (RCC), 2025) (Figure 2). The near-equal AIPI composite scores (Hungary 0.563; Serbia 0.537) indicate comparable national AI ecosystem readiness (IMF, 2026a), suggesting that Serbia's low enterprise AI adoption reflects demand-side barriers — awareness, cost, and skills — rather than systemic infrastructure deficits, consistent with Stojanovska-Stefanova et al. (2025).

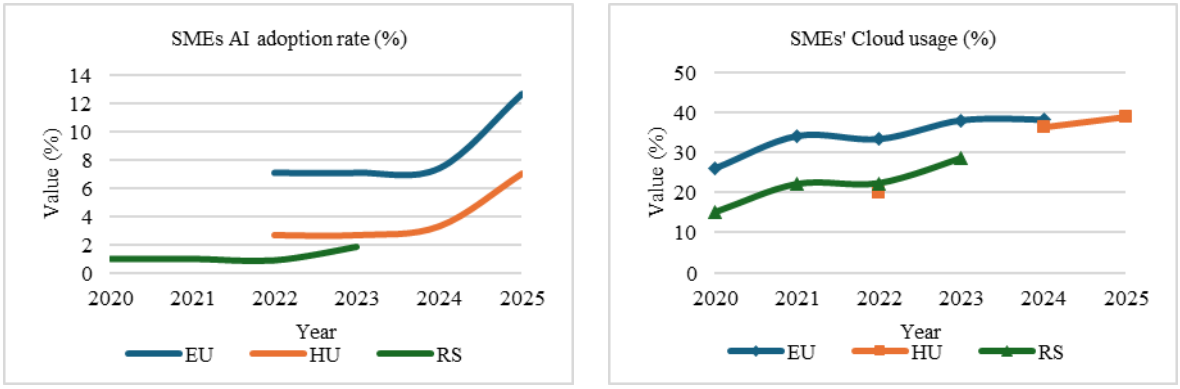


Figure 2. Cloud and AI usage by SMEs (%) for Hungary, Serbia and EU27. Source: (European Commission, 2025b, 2025c; Regional Cooperation Council (RCC), 2025)

Critically, the literature reveals that these technology barriers interact with cultural and organizational resistance. Varbanovaa et al. (2023) identified organizational culture as one of five decisive implementation factors, with statistically stronger effects in agri-food than manufacturing SMEs. Saáry et al. (2022) found Hungarian and Slovakian SMEs divided into two clusters — Concerned-Inspired and Indifferent-Conservatives — where the latter group, comprising a substantial minority, does not regard digitalization as a strategic priority at all. This cultural dimension is not captured by index data but is essential for understanding why cloud and AI adoption rates remain below what infrastructure and policy environments would predict.

4.4. E-Commerce and Big Data: Selective Adoption and Sectoral Differences

Serbia's higher online selling rate (28.4%, 2023) than Hungary (21.27%, 2025) and the EU (20.13%, 2025) challenges any simple narrative of uniform Hungarian superiority (European Commission, 2025c; Regional Cooperation Council (RCC), 2025). This likely reflects the prevalence of consumer-facing e-commerce platforms and cross-border digital trade in Serbia, where low-barrier marketplace entry enables online sales without strategic digital transformation (Figure 3). Miski et al. (2025) note that Serbian SMEs in hospitality and tourism face high digital tool costs but have adopted booking and direct sales platforms pragmatically, which may inflate e-commerce figures relative to deeper transformation metrics. Damnjanović et al. (2025) classify such firms as Experimenters: digital channels are deployed opportunistically without AI or analytics integration. This creates the pattern visible in Table 2 — high e-commerce, low AI and big data — which represents digital presence without digital intelligence.

Big data use in Hungary (6.65%) similarly lags the EU (13.64%), consistent with Horváth's (2023) finding that advanced data capabilities remain peripheral for most Hungarian SMEs. The cross-country finding by Tick (2023) that over half of SMEs in the sample of six CEE countries (V4 countries, Serbia and Bulgaria) are unfamiliar with Industry 4.0 provides structural context: without basic concept awareness, neither big data nor AI adoption can be expected to scale rapidly.



Figure 3. E-selling, Digital Intensity and Big Data adoption (%) for Hungary, Serbia and EU27. Source: (European Commission, 2025b, 2025c; Regional Cooperation Council (RCC), 2025)

4.5. Synthesis: Towards Intelligent Business Models via Marketing 5.0

Taken together, the results reveal that both countries face a mid-transformation impasse: basic digital channels exist, but the data infrastructure to generate customer intelligence does not. Through the Marketing 5.0 lens (2021), the path forward requires a phased strategy: first consolidate cloud and CRM infrastructure (closing the existing 10-percentage-point gap for Serbia); then build toward data analytics and AI-enabled personalization. For Serbia, the strong e-commerce base is the natural entry point — transactional data from online sales, if properly harvested via cloud analytics, can fund and motivate the next layer of digital investment. For Hungary, the bottleneck is not awareness or infrastructure but strategic commitment: Saáry et al. (2022) and Szennay and Csákné Filep (2024) both point to the persistence of reactive, compliance-driven digitalization among Hungarian SMEs that limits the transition to genuinely intelligent business models.

Empirical research confirms that, as a manifestation of customer readiness for digitalization, online shopping exerts strong external pressure to transform marketing strategies (Nogami & Senra, 2025). Given the outstanding results observed in Serbia based on the research findings, an important research question for future study is to explore how companies in Serbia are responding to external pressure.

5. CONCLUSION

This index-based comparative assessment reveals two distinct digitalization profiles shaped not only by technology gaps but by cultural attitudes, government support effectiveness, and sectoral structures. Hungary shows convergence toward EU averages in cloud adoption and

digital skills while lagging in AI and big data; Serbia demonstrates structural skills decline and minimal AI uptake but unexpectedly strong e-commerce engagement. Both findings are consistent with the literature: Endrődi-Kovács and Stukovszky (2022) on Hungary's reactive digitalization, Damnjanović et al. (2025) on Serbia's Experimenter-majority SME landscape, and Varbanovaa et al. (2023) on the decisive role of organizational culture and leadership across CEE. Through the Marketing 5.0 framework, both countries are caught in a mid-transformation paradox — digital presence without digital intelligence — that requires not only technology investment but human-centric strategic reorientation.

5.1. Policy Recommendations

Three targeted interventions follow from the integrated findings. First, skills investment must be differentiated and urgently prioritized in Serbia to reverse the declining trajectory: adult digital upskilling programmes aligned with DESI Human Capital targets are more pressing than further infrastructure grants. Hungary should consolidate ICT specialist development at higher education level to sustain its EU-convergence trajectory. Second, AI adoption barriers are primarily cultural and awareness-based rather than infrastructural (confirmed by AIPI near-parity): AI voucher programmes modelled on EDIH testing-as-a-service would reduce entry barriers, but must be paired with sector-specific capacity building — particularly for hospitality and agri-food SMEs identified by Miškić et al. (2025) and Varbanovaa et al. (2023) as most resistant. Third, Serbia's e-commerce strength is an underexploited lever: linking online-selling SMEs to cloud analytics subsidies creates a natural upgrade pathway to AI adoption, building on existing customer transaction data as the foundation for Marketing 5.0-aligned intelligent business models.

5.2. Research Limitations

Three primary limitations apply in this case. First, Serbia's non-EU status limits DESI granularity, requiring partial reliance on national statistical sources with potentially differing definitions. Second, index data reflect surveys with 12–18-month temporal lags and inherent response biases. Third, the aggregate analysis cannot capture the sectoral heterogeneity identified in the primary literature — manufacturing, retail, services, and agri-food SMEs face substantially different digitalization dynamics (Varbanovaa et al., 2023; Miskic et al., 2025) that country-level indices obscure.

5.3. Future Research

The index-based baseline established here supports three primary research extensions. First, firm-level surveys should validate the adoption rates found in secondary data and test the Damnjanović et al. (2025) Traditionalist-Experimenter-Strategic Adopter typology against Hungarian SMEs, where a comparable classification is yet to be developed. Second, the declining digital skills trajectory in Serbia warrants qualitative investigation: longitudinal case studies similar to Jankulović and Kovačević (2025) can reveal whether skills decline reflects brain drain, educational system gaps, or measurement artefacts.

Third, three emerging themes could be identified as rising fields — sustainability and digital transformation integration ("digitainability") (2022), leadership and workforce adaptation in Industry 4.0, and AI integration pathways for SMEs — represent opportunities for hypothesis-driven primary research in both countries, particularly as Serbia advances toward EU accession and its DESI trajectory is expected to shift. The intersection of

digitalisation and environmental sustainability — termed "digitainability" — represents an emerging and policy-relevant research direction: Voza et al. (2022), in a comparative study of Serbian and Polish SMEs, confirmed that both groups perceive digitalisation as beneficial for environmental goals, with carbon emission reduction emerging as the single most discriminating factor between the two countries, underscoring that the green and digital agendas are increasingly inseparable for CEE SMEs.

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