

МЕНЕДЖМЕНТ

DOI: <https://doi.org/10.32782/2521-666X/2026-93-16>
UDC 005:658.8:004.738.5

Ventsuryk Alisa

Candidate of Economics (Ph.D.),
National University of Water and Environmental Engineering
ORCID: <https://orcid.org/0000-0002-1583-664X>

Венцурик А.М.

Національний університет водного господарства
та природокористування

**DIGITAL INTENSITY AND WEB-SALES IN EU BUSINESS:
A BENCHMARK ANALYSIS WITH IMPLICATIONS FOR UKRAINE**

**ЦИФРОВА ІНТЕНСИВНІСТЬ ТА WEB-ПРОДАЖІ В БІЗНЕСІ ЄС:
БЕНЧМАРКІНГОВИЙ АНАЛІЗ ІЗ ПРАКТИЧНИМИ ІМПЛІКАЦІЯМИ ДЛЯ УКРАЇНИ**

This paper conceptualises business digitalisation as a managerial capability to integrate processes and data rather than the adoption of isolated tools. It discusses how digital intensity and the uptake of ERP, CRM and BI relate to the organisation of online sales and to the governance burden of e-commerce fulfillment. Particular attention is paid to the strategic trade-off between own websites/apps and marketplace-based selling, stressing why the former strengthens control over customer data and experience but increases integration and analytics requirements, while the latter can accelerate market access yet increase dependence on platform rules, fees and constrained data access. The paper also outlines how the EU benchmark logic can be transferred to Ukraine as a replication and diagnostics framework using official ICT-in-enterprises statistics, while keeping methodological comparability constraints explicit.

Keywords: digital intensity; ERP; CRM; business intelligence (BI); e-commerce; web-sales; marketplaces; process integration; data governance.

У статті розглянуто управлінський вимір цифровізації бізнесу крізь призму цифрової інтенсивності підприємств, використання ключових управлінських інформаційних систем (ERP, CRM, BI) та організації цифрових каналів збуту. Актуальність теми зумовлена тим, що електронна комерція перетворилася на комплекс операційних процесів, де стійкість і результативність залежать від інтеграції фронт- та бек-офісу, дисципліни даних, прозорості виконання замовлень і контролю сервісу. У фокусі уваги – перехід від точкових IT-рішень до цілісних процесно-даних архітектур, які підтримують контур планування, виконання, контролю та зворотного зв'язку з клієнтом. Показано, що менеджери стикаються з каналною дилемою: власні вебсайти/додатки підсилюють контроль над клієнтськими даними та досвідом, але потребують глибшої інтеграції процесів, аналітики й управління якістю даних; натомість маркетплейси полегшують доступ до попиту та знижують бар'єри входу, водночас формують залежність від правил платформи, комісій, механізмів ранжування, стандартів сервісу та обмежень доступу до даних. Окремо обґрунтовано, як сформований на даних ЄС бенчмаркінг може бути застосований до України як рамка діагностики цифрової зрілості та архітектури web-sales: запропоновано протокол реплікації на базі офіційної статистики щодо використання ІКТ на підприємствах і окреслено принципи уникнення методологічно некоректних прямих зіставлень (узгодження визначень, порогів охоплення, секторів, вплив шоків). Таким чином, стаття формує управлінську логіку підготовки підприємств до цифрових продажів і підвищення керованості процесів у різних каналних моделях, а також окреслює напрями подальших досліджень для перевірки механізмів на рівні галузей і окремих підприємств. Практична значущість підходу полягає у можливості структурувати управлінські пріоритети цифровізації для МСП: від базової «цифрової гігієни» та інтеграції обліку і запасів до побудови клієнтських контурів (CRM) і аналітичного управління (BI) для повторних продажів, персоналізації та контролю якості сервісу. Для українського бізнесу це підсилює підхід до вибору технологічних інвестицій не за модністю інструментів, а за їхнім внеском у керованість процесів і даних у вибраній каналній конфігурації.

Ключові слова: цифрова інтенсивність; ERP; CRM; бізнес-аналітика (BI); електронна комерція; web-sales; маркетплейси; інтеграція процесів; управління даними.

Problem statement. In managerial practice, digitalisation is often presented as a straightforward route to higher efficiency and competitiveness. Yet the managerial logic of digital transformation is more complex: material benefits emerge mainly when digital tools enable process integration, data discipline and an effective “plan-execute-control” loop. In e-commerce, this requirement becomes critical because online selling is not only a marketing channel but an operational system that includes order capture, pricing, inventory and availability management, fulfillment and delivery, after-sales service, returns, and complaint and risk handling. Accordingly, e-commerce performance depends on the alignment of front-office activities (sales, service, marketing) and back-office operations (logistics, warehousing, accounting and payments), as well as on management’s ability to ensure transparency and controllability of data flows.

An additional challenge is the heterogeneity of digitalisation across firm size and national contexts. Small and medium-sized enterprises (SMEs) frequently develop digital initiatives in a fragmented way, whereas large firms more often build integrated management architectures. At the same time, firms face a strategic channel dilemma in web-sales: selling via own websites/apps increases control over customer data and service quality but requires deeper integration and analytics; selling via marketplaces can lower entry barriers and accelerate access to demand, yet may increase dependence on platform rules, fees and constrained data access. Therefore, a practical managerial task arises: to determine which management information systems (ERP/CRM/BI) should be prioritised under different digital sales models and levels of digital maturity.

Analysis of recent research and publications. Recent research increasingly interprets digital transformation as a combination of technological solutions and managerial practices that together build a firm’s capacity to integrate processes and data, improve decision quality and scale operations. For SMEs, the OECD highlights resource constraints, skills gaps, cyber vulnerabilities, and instrumental fragmentation when digital tools do not form a coherent management loop [1].

From a measurement perspective, Eurostat defines the Digital Intensity Index (DII) as a composite indicator based on 12 digital practices and uses it for cross-country comparability [2]. The key advantage of DII is cross-country comparability and a relatively transparent operationalisation. Methodological comparability is supported by Eurostat’s harmonised survey framework and ESMS metadata for ICT usage in enterprises [3]. Eurostat reporting also tracks the uptake of core e-business applications – ERP, CRM and BI – providing a comparable evidence base for

managerial interpretation [4; 5]. Nour M. A. shows that ERP performance effects depend on contextual factors such as firm size, implementation quality and process alignment, which requires explicit boundary conditions in interpretation [6]. Skare M., de Obesso M. and Ribeiro-Navarrete S. associate digital transformation with competitiveness and business model change, while noting heterogeneity across national contexts and proxy choices [7]. Li X., Wang M. and Shi D. discuss platform-channel introduction and its implications for supply-chain interaction and channel structure [8]. D’Annunzio A. and Russo A. analyse transaction fees and pricing mechanisms that can shape seller incentives and channel sustainability [9].

However, at the cross-country level, there remains a lack of an operationalised, methodologically consistent comparison of how digital intensity and ERP/CRM/BI uptake relate to process-oriented outcomes in digital channels (e-sales) and to web-sales configurations (own channels versus marketplaces). This gap limits the development of actionable managerial guidance for firms operating in different national ecosystems and under different digital selling architectures.

The purpose of this article is to use open, harmonised Eurostat indicators for 2023 to assess enterprise profiles of digital intensity and the uptake of management information systems (ERP/CRM/BI), and to relate them to process-oriented outcomes in e-commerce (e-sales and the structure of web-sales), with a focus on benchmark EU countries.

The object of the study is EU enterprises (by size class) and a benchmark-country sample built on the principle of contrasting digital channel architectures: countries with a strong reliance on own-channel web-sales and countries with a high role of marketplaces.

The subject of the study is the statistical profiles of digital intensity, ERP/CRM/BI uptake and web-sales channels, as well as management-oriented interpretations of these profiles.

Research tasks include:

- to justify the choice of DII and e-business applications as proxies for management digitalisation;
- to document the size gradient of digitalisation and ERP/CRM/BI uptake at the EU level and to quantify relative gaps between SMEs and large enterprises;
- to describe process-oriented outcomes in digital channels through e-sales and the structure of web-sales;
- to identify managerially meaningful channel configurations and derive practical implications for prioritising process and data integration.

Presentation of the main material. The empirical basis consists of harmonised EU indicators on ICT usage and e-commerce in enterprises, derived from the annual survey “ICT usage and e-commerce in enterprises”. Survey methodology and quality assurance are described

in Eurostat metadata, which supports cross-country comparability through consistent definitions, coverage and data collection procedures [3].

Key variables are operationalised as follows:

1) Digital Intensity Index (DII) is a composite indicator based on 12 digital practices; each practice contributes one point, and intensity levels are grouped into 0-3, 4-6, 7-9 and 10-12 [2]. For the notion of “at least basic” digital intensity, a threshold of ≥ 4 is used, consistent with Eurostat reporting [4].

2) ERP/CRM/BI uptake is measured as the share of enterprises using these e-business applications. Conceptually, ERP is treated as a tool for integrating resource processes; CRM as a tool for customer data and service management; BI as a layer for analytical management support and performance monitoring [5].

3) Process-oriented proxies of digital-channel outcomes include: a) the share of enterprises with online sales (e-sales), interpreted as the ability to run a digital sales process; b) the structure of web-sales by channel type - sales via own websites/apps and/or via e-commerce marketplaces-measured among enterprises with web-sales [10; 11].

The study applies comparative descriptive analysis and structural interpretation of channels, calculates gaps between groups (percentage-point differences and ratios), and builds an interpretable typology of benchmark-country channel configurations. Given the aggregated nature of survey indicators, results are interpreted as statistical profiles and associations rather than causal effects.

For the benchmark analysis, the following EU countries are selected: Poland (PL), Czech (CZ), Germany (DE), Estonia (EE), Lithuania (LT) and Latvia (LV). The selection logic follows a contrast profile principle with respect to web-sales channels: 1) countries dominated by own websites/apps (EE, CZ), 2) countries with a high role of marketplaces (LT, PL), 3) a large reference market with developed infrastructure and diverse e-commerce structures (DE), and 4) an additional country to balance the regional profile (LV). This design enables interpretation not only of indicator levels but also of managerial implications associated with different digital sales architectures.

Eurostat data show a pronounced size gradient. In 2023, 58% of SMEs reached at least a basic digital

intensity level ($DII \geq 4$), compared to 91% of large enterprises [4]. The absolute gap is 33 percentage points, while the ratio implies that large enterprises are about 1,57 times more likely to achieve a basic digital baseline. Gaps are even stronger for e-business applications: ERP is used by 38% of small enterprises and 86% of large enterprises; CRM by 22% and 61%; BI by 11% and 63%, respectively [5]. For BI, the difference reaches 52 percentage points and the large-to-small ratio exceeds five. Managerially, this aligns with the interpretation of BI as a higher layer of digital maturity: it requires data quality, integrated processes and sufficient managerial demand for analytics. At the same time, it is essential to distinguish system presence from impact: empirical research suggests that ERP effects on performance depend on contextual factors such as firm size, implementation quality, process alignment and time since adoption [6]. Therefore, the indicators are treated as proxies of management digital infrastructure rather than direct causal determinants of efficiency. To document the size gradient in management digitalisation, the next table 1 summarises EU-level shares for reaching a basic digital intensity ($DII \geq 4$) and for adopting core e-business applications (ERP/CRM/BI) in 2023.

As Table 1 indicates, the differences between SMEs and large enterprises are substantial and suggest that integrated systems and analytics are concentrated among larger organisations, which may shape their capacity to govern end-to-end e-commerce processes. To strengthen interpretability beyond raw percentages, Table 2 reports absolute (percentage-point) and relative (ratio) gaps between SMEs and large enterprises using the indicators in Table 1.

The calculated ratios highlight that the steepest maturity gap concerns BI, supporting the managerial interpretation of analytics as a higher layer of digital capability that depends on data quality and process integration.

Process-oriented outcomes in digital channels can be approximated through e-sales because online selling requires coordination of a full set of processes – from offer creation and order intake to fulfillment, payments, returns and service. In 2023, 23,8% of EU enterprises conducted online sales; the shares differ substantially by size: 46,5% of large, 30,5% of medium-sized and

Table 1

Digital intensity and the use of e-business applications in the EU by enterprise size, 2023

Indicator	SMEs	Large enterprises
Reached at least basic digital intensity ($DII \geq 4$), %	58	91
Use ERP, % of enterprises	38	86
Use CRM, % of enterprises	22	61
Use BI (business intelligence), % of enterprises	11	63

Source: compiled from Eurostat data [4; 5]

Table 2

Relative gaps between SMEs and large enterprises (computed from Table 1)

Indicator	Difference, p.p.	Ratio (large/SMEs)	Interpretation (brief)
DII ≥ 4	33	1,57	basic digital baseline is more common among large firms
ERP	48	2,26	resource/process integration is more common among large firms
CRM	39	2,77	customer-data management is more developed among large firms
BI	52	5,73	analytics as a higher layer of digital maturity

Note: Difference (p.p.) = (large - SMEs). Ratio computed as (large/SMEs)

Source: author's calculations based on Eurostat data [4; 5]

21,9% of small enterprises reported online sales [11]. In light of Tables 1–2, this asymmetry is consistent with the higher prevalence of integrated management systems among large firms. However, for scientific correctness, the analysis treats this as co-variation rather than a direct causal relationship. The mechanism may be bidirectional: higher digital capability and data integration can facilitate the launch of e-sales, while the pressure of operating digital channels can also stimulate ERP/CRM/BI adoption. Disentangling these mechanisms requires panel designs and/or firm-level evidence. A further dimension of e-commerce outcomes is the architecture of web-sales. Selling via own websites/apps strengthens control over customer data, content and service quality, but it raises requirements for integration with back-office systems, data quality management and analytics (CRM/BI), and demands stronger process discipline. Marketplace-based selling can reduce entry barriers and speed up access to demand, yet it increases dependence on platform rules (access conditions, ranking mechanisms, fees) and often limits direct control over customer data.

At the EU level, among enterprises conducting web-sales, 85,77% used own websites/apps and 45,25% used marketplaces [10]. Benchmark countries exhibit marked contrasts: Estonia and Czech show very high shares of own-channel web-sales (98,11% and 95,12%), while Lithuania shows a substantially lower own-channel share (46,87%). Conversely, marketplace use is highest in Lithuania (86,64%) and Poland (63,46%), while Estonia reports a much lower marketplace share (17,43%) [10]. These patterns support a management-oriented typology:

- Own-channel model (EE, CZ): prioritises CRM/BI, data quality management and integration across order, inventory and logistics; value is captured through customer experience control and repeat sales.
- Marketplace-oriented model (LT, PL): prioritises fulfillment standardization (ERP/accounting/inventory), operational control points and governance of platform-dependence risks.

In marketplace contexts, transaction fees and related pricing constraints can shape seller incentives and margin structures, influencing the long-term decision to shift part of sales towards own channels [9]. Strategic

research on marketplace platforms also highlights that platforms reshape supply-chain tasks and can change the balance of competitive advantages [8]. From a governance viewpoint, managers should consider fee changes, ranking rule shifts, constrained customer data access, standardised service and logistics requirements, and scalable reputational risks. Practically, this translates into minimum control points (SLA targets, returns policies, content standards, fulfillment monitoring) and baseline integration with accounting and planning systems even when sales are primarily marketplace-based.

To connect digital capability with channel architecture, the following table 3 profiles benchmark countries by the share of enterprises conducting e-sales and by the distribution of web-sales across own websites/apps versus marketplaces.

The cross-country contrasts in Table 3 motivate the benchmark typology used in the discussion: own-channel-dominant markets imply stronger requirements for CRM/BI and customer-data governance, whereas marketplace-oriented profiles call for tighter fulfilment control and platform-risk management.

Taken together, Tables 1–3 support several justified generalisations. First, the size gradient of digitalisation is pronounced: large enterprises more frequently have a basic digital infrastructure (DII ≥ 4) and much more often deploy integration and analytics applications (ERP/CRM/BI). The relative-gap calculations show that the steepest maturity gap concerns BI, consistent with the notion that analytics requires both technology and mature data-and-process management practices. Second, e-sales as a proxy for digital sales process capability differs by enterprise size at the EU level, which is consistent with the view of online selling as a process competence requiring front-to-back integration. Third, benchmark countries display distinct web-sales architectures that are managerially relevant: own-channel models logically reinforce the need for CRM/BI and customer-data governance, while marketplace-oriented models reinforce the need for fulfillment standardisation and platform-risk management. Finally, the credibility of these inferences is strengthened by the use of

Table 3

E-sales and web-sales channel profile in EU benchmark countries, 2023

Country	Enterprises with e-sales, %	Web-sales via own website/app, %*	Web-sales via marketplaces, %*
Poland (PL)	17,80	74,15	63,46
Czech (CZ)	23,72	95,12	40,48
Germany (DE)	22,97	82,29	52,45
Estonia (EE)	24,83	98,11	17,43
Lithuania (LT)	42,07	46,87	86,64
Latvia (LV)	19,50	88,79	38,44

* Shares are computed among enterprises with web-sales

Source: compiled from Eurostat materials [10; 11]

official harmonised indicators and transparent definitions documented in Eurostat glossaries and metadata.

Limitations stem from the aggregated nature of survey statistics. The indicators capture shares of enterprises rather than sales intensity in monetary terms, which prevents direct measurement of e-commerce's contribution to turnover. Industry structure (NACE) and product/service types are not controlled for in this benchmark profile and may partly explain cross-country differences. Moreover, causal mechanisms between ERP/CRM/BI adoption and e-sales cannot be established with these data; further research would benefit from panel designs and firm-level evidence. Despite these limitations, the benchmark profiles provide an interpretable map for managerial decision-making and for formulating testable hypotheses. Although the empirical benchmarking in this study is based on harmonised EU-27 indicators, the managerial logic of linking digital intensity (process digitisation via ERP/CRM/BI) with web-sales architecture (direct webshops vs marketplaces) can be transferred to Ukraine as a practical benchmarking and diagnostics framework. It is especially relevant in the context of EU integration and post-shock recovery, where firms need to build a resilient digital backbone that supports sales continuity, customer trust and scalable operations.

From a data perspective, Ukraine has an official statistical basis to replicate the approach using the State Statistics Service of Ukraine (SSSU) dataset "Use of information and communication technologies in enterprises". The methodological documentation defines e-commerce turnover and its share in total sales (including sales via websites/web apps and EDI-type messages) and sets out key coverage rules and breakdowns. For applied research, this enables a transparent replication protocol: select the same conceptual indicators as in the EU analysis (connectivity, online presence, e-business applications, e-commerce turnover), document mapping decisions, and run an internal benchmarking by size class and sector before comparing trajectories with EU reference groups [12; 13]. However, direct cross-country

comparisons require careful harmonisation: coverage rules (enterprise size thresholds), sectoral composition, wartime structural breaks, and the operational definition of e-commerce (websites/web apps/EDI) may differ. Therefore, a defensible Ukraine-EU linkage is best implemented as a two-step procedure:

1) internal benchmarking of Ukraine by firm size and sector using national statistics;

2) external orientation using EU reference distributions (benchmark countries) while explicitly documenting definitional differences. The SDMX API published by the State Statistics Service of Ukraine enables reproducible extraction and updates of the underlying indicators, supporting transparent research workflows and periodic monitoring [14].

To operationalise the Ukraine linkage without forcing non-comparable statistics into the Eurostat framework, Table 4 maps the paper's constructs to the closest available official indicators in Ukraine. The table is intended as a replication protocol for follow-up studies and teaching cases.

The mapping in Table 4 should be used for contextual benchmarking rather than direct rank comparisons with EU countries: researchers should document definitional differences (enterprise size thresholds, sector coverage and the definition of e-commerce turnover) and prioritise within-Ukraine comparisons by size class and sector before external orientation to EU reference distributions.

Conclusions. Based on harmonised EU indicators for 2023, the article develops a comparative profile of management digitalisation and digital selling architectures. Digital intensity and the uptake of ERP/CRM/BI exhibit a clear size gradient: large enterprises more often build integrated digital management infrastructure, while the largest maturity gap between small and large firms appears in analytics (BI). Digital sales process capability, approximated by e-sales, is also uneven across size classes and varies across benchmark countries.

The main managerial conclusion is that effective e-commerce digitalisation is not a channel choice alone; it requires aligning the chosen channel model

Table 4

Ukraine replication map: linking the study constructs to official ICT-in-enterprises indicators

Construct in this study	Closest Ukrainian official indicator (SSSU)	How to interpret for management	Notes for EU linkage
Digital backbone (connectivity & online presence)	Enterprises with Internet access / corporate website (ICT in enterprises dataset).	Baseline readiness for digital process integration and customer interaction.	Check coverage by size class (10+ employees) and sector; align with Eurostat size breakdown.
Process digitalisation (e-business applications)	Use of ERP / CRM / BI (where available in the dataset) and related e-business application uptake.	Signals whether digital tools form a coherent management loop (planning-sales-analytics).	If indicator wording differs, document mapping and treat as proxy; triangulate with survey/case evidence.
Web-sales architecture	Share/volume of e-commerce turnover and enterprises conducting e-commerce (websites/web apps/EDI).	Captures selling model and channel dependence (direct vs mediated).	E-commerce definition may differ; report definitional notes and avoid over-precise rank comparisons.
Replication & updates	SDMX dissemination of the SSSU ICT-in-enterprises dataset and its methodological definitions	Supports reproducible data pulls for monitoring and teaching cases.	Use SDMX API queries to version-control datasets; record retrieval dates in the paper.

Source: compiled by the author based on [12–14]

with priorities for process and data integration. For own-channel models, CRM/BI, data quality and customer-experience governance become critical. For marketplace-oriented models, fulfillment standardisation, minimum operational control points and platform-risk governance take priority. Overall, digital transformation should be approached as a

managerial design of processes and data architectures, not as a collection of standalone tools.

Further research should extend the benchmark approach with multi-year panel analysis, industry-level detail and mixed methods (quantitative analysis combined with case studies) to test mechanisms and refine evidence-based recommendations.

Список літератури:

1. OECD. *The Digital Transformation of SMEs*. Paris : OECD Publishing, 2021. URL: https://www.oecd.org/en/publications/the-digital-transformation-of-smes_bdb9256a-en.html
2. Eurostat. Glossary: Digital Intensity Index (DII). *Statistics Explained*. Eurostat, 6. p. URL: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Digital_Intensity_Index_\(DII\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Digital_Intensity_Index_(DII))
3. Eurostat. ICT usage in enterprises (isoc_e): ESMS metadata. Eurostat, 6. p. URL: https://ec.europa.eu/eurostat/cache/metadata/en/isoc_e_esms.htm
4. Eurostat. How digitalised have the EU’s enterprises become? *Eurostat News*. Eurostat, 2024. URL: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240829-1>
5. Eurostat. Large enterprises used more e-business applications. *Eurostat News*. Eurostat, 2024. URL: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240516-2>
6. Nour M. A. The Impact of ERP Systems on Organizational Performance: The Role of Contextual Factors. *International Journal of Enterprise Information Systems*. 2023. Vol. 19, № 1. P. 1–29. DOI: <https://doi.org/10.4018/IJEIS.329960>
7. Skare M., de Obesso M. M., Ribeiro-Navarrete S. Digital transformation and European small and medium enterprises (SMEs): A comparative study using digital economy and society index data. *International Journal of Information Management*. 2023. Vol. 68. P. 102594. DOI: <https://doi.org/10.1016/j.ijinfomgt.2022.102594>
8. Li X., Wang M., Shi D. Strategic introduction of marketplace platform and its impacts on supply chain. *International Journal of Production Economics*. 2021. Vol. 242, Вып. С. P. 108300. DOI: 10.1016/j.ijpe.2021.108300. URL: https://www.researchgate.net/publication/334248117_Strategic_introduction_of_the_marketplace_channel_considering_logistics_costs_and_product_informatio
9. D’Annunzio A., Russo A. Platform Transaction Fees and Freemium Pricing. TSE Working Paper. 2024. No. 24-1569. P. 43. URL: https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/wp/2024/wp_tse_1569.pdf
10. Eurostat. E-commerce statistics. *Statistics Explained*. Eurostat, 6. p. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=e-commerce_statistics
11. Eurostat. EU enterprises’ online sales reach new heights in 2023. *Eurostat News*. Eurostat, 2025. URL: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250227-2>
12. Державна служба статистики України. Використання інформаційно-комунікаційних технологій на підприємствах : опис набору даних. Держстат, 6. p. URL: <https://stat.gov.ua/uk/datasets/vykorystannya-informatsiyno-komunikatsiynykh-tekhnologiy-na-pidpryemstvakh>
13. Державна служба статистики України. Методологічні положення щодо організації державного статистичного спостереження щодо використання ІКТ на підприємствах (у т. ч. показників електронної комерції). Держстат, 2021. URL: https://stat.gov.ua/sites/default/files/migration/files/2022/198_2022/198_2022.pdf

14. Державна служба статистики України. SDMX API v2.1 : документація. Держстат, б. р. URL: <https://stat.gov.ua/en/development-api/sdmx-api-v2-1>

References:

1. OECD (2021) The Digital Transformation of SMEs. Paris: *OECD Publishing*. Available at: https://www.oecd.org/en/publications/the-digital-transformation-of-smes_bdb9256a-en.html
2. Eurostat (n.d.) Glossary: Digital Intensity Index (DII). Available at: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary: Digital Intensity Index \(DII\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary: Digital Intensity Index (DII))
3. Eurostat (n.d.) ICT usage in enterprises (isoc_e): *ESMS metadata*. Available at: https://ec.europa.eu/eurostat/cache/metadata/en/isoc_e_esms.htm
4. Eurostat (2024) How digitalised have the EU's enterprises become? *Eurostat News*, August 29, 2024. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240829-1>
5. Eurostat (2024) Large enterprises used more e-business applications. *Eurostat News*, May 16, 2024. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240516-2>
6. Nour M. A. (2023) The Impact of ERP Systems on Organizational Performance: The Role of Contextual Factors. *International Journal of Enterprise Information Systems*, vol. 19, no. 1, pp. 1–29. DOI: <https://doi.org/10.4018/IJEIS.329960>
7. Skare M., de Obesso M. M., Ribeiro-Navarrete S. (2023) Digital transformation and European small and medium enterprises (SMEs): A comparative study using digital economy and society index data. *International Journal of Information Management*, vol. 68, pp. 102594. DOI: <https://doi.org/10.1016/j.ijinfomgt.2022.102594>
8. Li X., Wang M., Shi D. (2021) Strategic introduction of marketplace platform and its impacts on supply chain. *International Journal of Production Economics*, vol. 242, pp. 108300. DOI: <https://doi.org/10.1016/j.ijpe.2021.108300>
9. D'Annunzio A., Russo A. (2024) Platform Transaction Fees and Freemium Pricing. *TSE Working Paper*, no. 24–1569. Available at: https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/wp/2024/wp_tse_1569.pdf
10. Eurostat (n.d.) E-commerce statistics (Statistics Explained). Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=e-commerce_statistics
11. Eurostat (2025) EU enterprises' online sales reach new heights in 2023. *Eurostat News*, February 27, 2025. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250227-2>
12. Derzhavna sluzhba statystyky Ukrainy (n.d.) Vykorystannia informatsiino-komunikatsiinykh tekhnolohii na pidpriumstvakh: nabir danykh [Use of information and communication technologies in enterprises: dataset]. Available at: <https://stat.gov.ua/uk/datasets/vykorystannya-informatsiyno-komunikatsiinykh-tekhnolohiy-na-pidpriumstvakh> (in Ukrainian)
13. Derzhavna sluzhba statystyky Ukrainy (2021) Metodolohichni polozhennia shchodo orhanizatsii derzhavnoho statystychnoho sposterezhennia shchodo vykorystannia IKT na pidpriumstvakh (u t. ch. pokaznykiv elektronnoi komertsii) [Methodological provisions on the organisation of the state statistical survey on ICT use in enterprises (incl. e-commerce turnover indicators)]. Available at: https://stat.gov.ua/sites/default/files/migration/files/2022/198_2022/198_2022.pdf (in Ukrainian)
14. Derzhavna sluzhba statystyky Ukrainy (n.d.) SDMX API v2.1 [SDMX API v2.1]. Available at: <https://stat.gov.ua/en/development-api/sdmx-api-v2-1>

Дата надходження статті: 22.01.2026

Дата прийняття статті: 10.02.2026

Дата публікації статті: 25.02.2026