DIGITAL TRANSFORMATION OF EU PUBLIC PROCUREMENT: CURRENT LEGISLATIVE FRAMEWORK, STATE OF IMPLEMENTATION AND FUTURE DIRECTIONS

Assoc. Prof. Petra Ferk, Ph. D. *

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This paper examines the paradox of digitalisation in EU public procurement: although extensive electronic infrastructure has been introduced since 2014, genuine transformation remains limited due to fragmented implementation across Member States. Near-term developments are likely to prioritise data analytics, interoperability, and oversight mechanisms rather than a mandatory true digital-by-default, end-to-end systems with integrated artificial intelligence. However, should this not be accomplished, contracting authorities will increasingly rely on external solutions, reinforcing the fragmentation EU policy sought to eliminate. Meaningful progress will require coordinated legislative, technological, organisational, and human action.

Key words: EU public procurement; digital transformation; interoperability; artificial intelligence (AI); data analytics

* Petra Ferk, Ph. D., Associate Professor, Institute for Public Private Partnership, Ukmarjeva 2, 1000 Ljubljana, Slovenia; New University, Mestni trg 23, 1000 Ljubljana, Slovenia; petra.ferk@pppforum.si;
ORCID ID: orcid.org/0000-0002-8682-008X

1. INTRODUCTION

Public procurement accounts for a significant share of EU economic activity.[1] The EU has made the digitalisation of procurement a strategic priority in order to improve transparency, efficiency, and competition, while strengthening accountability in public spending. Digital tools offer more than a simple shift from paper to electronic formats: they create the possibility of fundamentally redesigning procurement processes.[2] The EU has supported this development through legislative reform, standardisation initiatives, and investment in technological infrastructure.

As analysed in this paper, the EU framework for electronic public procurement under Directive 2014/24/EU has digitised existing procedures rather than delivering genuine digital transformation. It continues to rely heavily on procurement notices and does not sufficiently support systematic data collection and use, which has contributed to the uneven development of initiatives such as eForms and the Public Procurement Data Space (PPDS).[3] Digital maturity in public procurement therefore remains modest when compared with available technological capabilities. As new EU public procurement legislation is being prepared, the central question is whether this situation can be overcome.

The aim of this paper is to analyse the current legislative framework and the state of digitalisation in EU public procurement and, on that basis, to identify the likely future directions of the field. This analysis draws on recent research, academic literature, and legislative developments. It focuses on implementation challenges, performance gaps, and the policy choices shaping digital procurement systems. The analysis is situated in a period of rapid technological change and regulatory evolution. Public procurement is searching for an optimal route from e-procurement 1.0 or 2.0 towards e-procurement 5.0 (see Section 3.2 below) and, more broadly, towards digital transformation that also takes sustainability,

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1 Every year, more than 250,000 public authorities in the EU spend around 16% of GDP, approximately €2.5 trillion per year, on public procurement; even a 1% efficiency gain could save around €20 billion per year. See European Commission, *Public procurement*, https://single-market-economy.ec.europa.eu/single-market/public-procurement_en (30 June 2026).

2 Hochstetter, J.; Vásquez, F.; Diéguez, M.; Bustamante, A.; Arango-López, J., *Transparency and E-Government in Electronic Public Procurement as Sustainable Development*, Sustainability, *vol.* 15, no. 5, 2023, pp. 1 – 24; Pekolj, N.; Hodošček, K.; Valjavec, L.; Ferk, P., *Digital Transformation of Public Procurement as an Opportunity for the Economy*, Lexonomica, *vol.* 11, no. 1, 2019, pp. 15 – 42.

3 *Cf.*, e.g., Telles, P., *The Evolution of Electronic Public Procurement Under Directive 2014/24/EU*, EPPPL, *vol.* 19, no. 4, 2024, pp. 242 – 248.

resilience, and a human-centric approach into account. This paper deliberately adopts a broad survey rather than a narrowly focused analysis, because the central question – what are the likely future directions of digital transformation in EU public procurement – can only be meaningfully answered by prioritising breadth and the wider policy and political context. Given journal length limits, it highlights key debates and challenges, situates them within the existing literature and EU policy, and provides an overview to guide readers.

The paper adopts a forward-looking perspective and argues for a digital-by-default, end-to-end approach to procurement. Less ambitious pathways appear increasingly inadequate in light of the pace of technological development. If the last decade of digital procurement is viewed as a period of missed opportunities[4], the next decade will be decisive: contracting authorities that fail to align with this trajectory risk efficiency losses and weaker public service delivery.

At the same time, implementation remains constrained by limited financial, organisational, and human resources.[5] Advanced digital solutions therefore require careful prioritisation and robust cost-benefit analysis. Although predictions must remain cautious, particularly in light of broader legislative uncertainty[6], current initiatives are sufficiently developed to justify a number of plausible expectations.

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[4] *Cf.* Telles, P., Correcting the lost decade of electronic public procurement in the EU, ERA Forum, *vol.* 26, 2025, pp. 509 – 525.

[5] For example, the Open Contracting Data Standard (OCDS) offers a structured model for organising public procurement data, but implementation remains uneven across EU contracting authorities because of cost barriers. The European Commission's increasing support suggests that wider adoption may follow. See Soylu, A.; Corcho, O. *et al.*, *TheyBuyForYou platform and knowledge graph: Expanding horizons in public procurement with open linked data*, Semantic Web: Interoperability, Usability, Applicability, *vol.* 13, no. 2, 2022, pp. 265 – 291; Bertocchi, E.; Caroli, M.; Casalino, N.; Falà, S.; Giovannetti, M.; Infante, K.; Orsi, A.; Mariotti, E.; Massimi, F.; Manzo, V.; Pizzolo, G.; Sellitto, G. P., *Accelerating Transparency and Efficiency in the Public Procurement Sector for a Smarter Society: eNotification and ESPD Integration for Developing E-procurement*, in: Uskov, V. L.; Howlett, R. J.; Jain, L. C. (eds.), *Smart Education and e-Learning – Smart Pedagogy*, Springer, Singapore, 2022, pp. 269 – 287.

[6] This includes the question whether the Directive(s) could or should be replaced by Regulation(s). Cf. Burnett, M., *Changing the EU Public Procurement Directives: When and How?*, EPPPL, *vol.* 20, no. 2, 2025, pp. 195 – 199.

2. CURRENT STATE

2.1. Regulation under the 2014 Public Procurement Package and Related EU Digital Legislation

Digitalisation in the EU began in the late 2000s and accelerated in the 2010s with the adoption of directives and the phased introduction of digital tools.[7] The process has developed through several stages, from the basic electronic publication of tender notices to more comprehensive e-procurement platforms extending beyond mandatory requirements.[8]

The legal framework for procurement digitalisation in the EU is anchored in the 2014 Public Procurement Package, consisting of Directive 2014/24/EU on public procurement[9], Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors[10], and Directive 2014/23/EU on the award of concession contracts[11]. Directive 2014/24/EU and Directive 2014/25/EU introduced the mandatory use of electronic means of communication, whereas Directive 2014/23/EU regulated e-procurement only on a voluntary basis. Under the 2004 Directives[12], the use of e-procurement had likewise remained voluntary.

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7 For a more detailed analysis of this development, see, e.g., Pekolj *et al.*, *op. cit.* (fn. 2), pp. 15 – 17; Ferk, P., *E-procurement between EU objectives and the implementation procedures in the Member States – Article 22(1) of the 2014 Directive*, in: Ølykke, G. S.; Sánchez Graells, A. (eds.), *Reformation or deformation of the EU public procurement rules*, Edward Elgar, Cheltenham, Northampton, 2016, pp. 103 – 105.

8 Ferk, *op. cit.* (fn. 7), pp. 101 – 124; Ferk, P., *Can the implementation of full e-procurement into real life address the real challenges of EU public procurement?*, EPPPL, *vol.* 11, no. 4, 2016, pp. 327 – 339.

9 Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC (hereinafter: Directive 2014/24/EU), OJ L 94, 28 March 2014, pp. 65 – 242.

10 Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC, OJ L 94, 28 March 2014, pp. 243 – 374.

11 Directive 2014/23/EU of the European Parliament and of the Council of 26 February 2014 on the award of concession contracts, OJ L 94, 28 March 2014, pp. 1 – 64.

12 Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors, OJ L 134, 30 April 2004, pp. 1 – 113; Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts,

Within this framework, the most extensive e-procurement obligations are contained in Directive 2014/24/EU. The key provision is Article 22(1) (Rules applicable to communication), while Article 90(1) and Article 90(2) (Transposition and transitional provisions) provide transitional arrangements for gradual implementation. A number of other provisions are also directly or indirectly linked to e-procurement. Directive 2014/24/EU thus introduced electronic procurement progressively, allowing contracting authorities and economic operators time to adapt.[13]

Under Directive 2014/24/EU, the mandatory pre-award phases of e-procurement are e-notification, electronic access to procurement documents, and e-submission of tenders. Since e-submission represented the principal innovation introduced by the Directive, its emphasis in Article 22(1) (Rules applicable to communication) is unsurprising.[14] By contrast, electronic communication and information exchange in the post-award phase are not mandatory, although "Member States and contracting authorities should remain free to go further if they so wish".[15] Directive 2014/55/EU on electronic invoicing in public procurement was subsequently adopted[16], introducing mandatory electronic communication in part of the post-award phase as well.[17]

The 2014 Directives therefore laid the foundation for mandatory e-procurement, while subsequent implementing regulations introduced more unified digital instruments, in particular Commission Implementing Regulation (EU) 2019/1780 on eForms[18] and Commission Implementing Regulation (EU) 2016/7

public supply contracts and public service contracts, OJ L 134, 30 April 2004, pp. 114 – 240.

13 For a more detailed analysis of these provisions and e-procurement regulation under the 2014 Public Procurement Package, see, e.g., Ferk, *op. cit.* (fn. 7), pp. 101 – 124; Ferk, P.; Ferk, B., *Rules applicable to communication*, in: Caranta, R.; Sánchez Graells, A. (eds.), *European public procurement: commentary on Directive 2014/24/EU*, Edward Elgar, Cheltenham, Northampton, 2021, pp. 236 – 252.

14 *Ibid.* See also Arrowsmith, S., *The Law of Public and Utilities Procurement: Regulation in the EU and UK*, *vol.* 1, 3rd ed., Sweet & Maxwell, London, 2014, p. 639.

15 Directive 2014/24/EU, recital 52.

16 Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement, OJ L 133, 6 May 2014, pp. 1 – 11.

17 For a more detailed analysis, see Ferk, *op. cit.* (fn. 8), pp. 327 – 339.

18 Commission Implementing Regulation (EU) 2019/1780 of 23 September 2019 establishing standard forms for the publication of notices in the field of public procurement, OJ L 272, 25 October 2019, pp. 7 – 73; OJ L 305, 25 November 2022, p. 12; OJ L 2884, 21 December 2023, p. 1.

establishing the standard form for the European Single Procurement Document (ESPD)[19]. These instruments were intended, *inter alia*, to create a more unified digital procurement space, simplify participation, strengthen competition and cross-border procurement, and support data-driven decision-making. Yet, as experience has shown, the results have remained limited.

A further consideration is the broader legal environment. When the 2014 Public Procurement Package was adopted, much of the EU legislation governing digital technologies had either not yet been adopted or was far less developed than it is now, more than a decade later. The digitalisation of public procurement is therefore shaped not only by procurement law but, increasingly, by this wider and rapidly evolving EU digital-law framework. This wider framework includes, among others, the eIDAS Regulation[20], the NIS2 Directive[21], the General Data Protection Regulation[22], the Digital Markets Act[23], the Digital Services Act[24],

19 Commission Implementing Regulation (EU) 2016/7 of 5 January 2016 establishing the standard form for the European Single Procurement Document, OJ L 3, 6 January 2016, pp. 16 – 34.

20 Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, OJ L 257, 28 August 2014, pp. 73 – 114.

21 Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive), OJ L 333, 27 December 2022, pp. 80 – 152.

22 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4 May 2016, pp. 1 – 88.

23 Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act), OJ L 265, 12 October 2022, pp. 1 – 66.

24 Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act), OJ L 277, 27 October 2022, pp. 1 – 102.

the Data Act[25], and, not least, the Interoperable Europe Act[26], which together define the legal environment for digital identity, cybersecurity, data, online platforms and interoperability within which procurement systems must operate. The proposed European Business Wallets should also be mentioned in this respect.[27]

2.2. Evaluation of the e-Procurement Achievements under the 2014 Public Procurement Package

The professional community and academic literature have been critical of the progress achieved under the 2014 public procurement directives in the field of digitalisation[28], a view we share. Analyses by EU institutions and the OECD likewise point to considerable room for improvement.

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[25] Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), OJ L, 2023/2854, 22 December 2023.

[26] Regulation (EU) 2024/903 of the European Parliament and of the Council of 13 March 2024 laying down measures for a high level of public sector interoperability across the Union (Interoperable Europe Act), OJ L, 2024/903, 22 March 2024.

[27] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (eIDAS Regulation), OJ L 257, 28 August 2014, pp. 73 – 114, as amended by Regulation (EU) 2024/1183 as regards establishing the European Digital Identity Framework, OJ L, 2024/1183, 30 April 2024. On the relevance of electronic signatures and the eIDAS framework to electronic public procurement, see Ferk, P., *Varnost, obličnost in celovitost podatkov v postopkih elektronskega javnega naročanja*, Pravnik, no. 5–6, 2019, pp. 323 – 354.

[28] *Cf.* Telles, *op. cit.* (fn. 4); Racca, G. M., *Digitalisation and competition: Proposals for upcoming public procurement reform*, in: Janssen, W.; Lichère, F.; Magga, K.-M. (eds.), *Reforming EU Public Procurement*, Edward Elgar, Cheltenham, 2026, pp. 118–133; Telles, P., *Rethinking the procurement Directives: How to improve electronic procurement and data capture*, telles.eu, 13 February 2025, https://www.telles.eu/rethinking-the-procurement-directives-how-to-improve-electronic-procurement-and-data-capture/ (29 June 2026); Da Rosa, I., *Digital Transformation of Public Procurement*, Ius Publicum Network Review, no. 2, 2023, https://www.ius-publicum.it/wp-content/uploads/2024/02/DEF_Da-Rosa_Digital-Transformations-of-Public-Procurement.pdf (19 March 2026); and Halonen, K.-M., *Public procurement digitalisation: a step forward or two steps back?*, guest post on the How to Crack a Nut blog, 3 September 2019, https://www.howtocrackanut.com/blog/2019/9/3/public-procurement-digitalisation-kirsi-halonen (29 June 2026).

In 2023, the European Court of Auditors, in its Special Report on public procurement in the EU[29], underlined that the possibilities offered by the Directives had not been fully used to achieve their objectives and strengthen competition. The report also considered certain aspects of e-procurement, including the impact of the ESPD and eForms, although those effects had not yet fully materialised when the report was prepared.[30] It concluded that competition in EU public procurement markets had declined over the period 2011–2021.

The Council subsequently recognised the need for action and invited the European Commission to analyse the existing framework and the causes of declining competition in the EU public procurement market.[31] In addition, the European Parliament adopted an own-initiative report in 2025 calling on the Commission to simplify the regulatory framework and revise EU public procurement rules in order to strengthen competitiveness, support a more sustainable economy, enhance EU resilience, and advance digitalisation.[32]

Against that background, the Commission prepared in 2025 its Evaluation of the 2014 Public Procurement Package, based on an open public consultation

[29] European Court of Auditors, *Public procurement in the EU: Less competition for contracts awarded for works, goods and services in the 10 years up to 2021*, European Court of Auditors, Luxembourg, 2023, available at https://www.eca.europa.eu/en/publications?ref=sr-2023-28 (5 March 2026).

[30] *Ibid.*, pp. 27 – 28.

[31] For further information, see Council Conclusions on the European Court of Auditors' Special Report No. 28/2023 Improving fair and effective competition for EU public procurement contracts awarded for works, goods and services, 3 June 2024. On the digital dimension, the conclusions emphasise the importance of high-quality public procurement data and advanced tools for market information and monitoring.

[32] For further information, see European Parliament resolution of 9 September 2025 on public procurement (2024/2103(INI)). On digitalisation in particular, see the dedicated section "Digital transformation of European public procurement", esp. paras 28 – 29: the European Parliament "calls for the Commission to adopt a digital-first approach in the revision of the EU public procurement legal framework" (para. 29) and stresses that the Commission and the Member States "must rethink how future procurement legislation should safely facilitate and secure digitalisation, rather than just digitalising current lengthy analogue processes" (para. 28); see also recital AE, which stresses that the increasing digitalisation of procurement must be accompanied by robust cybersecurity measures, interoperability prerequisites and easy-to-use, harmonised digital submission platforms ensuring transparency and machine readability, while noting that digitalisation can simplify access for businesses, in particular SMEs, and reduce the bureaucratic burden for smaller contracting authorities.

and other evidence-gathering methods.[33] Most respondents considered e-procurement beneficial for reducing administrative burden and improving access, particularly for SMEs. The directives were also assessed as partially effective in preserving competition. Access to procurement improved: the number of notices published in Tenders Electronic Daily (TED) increased by 70 per cent, and the real value of procedures above the EU thresholds doubled. However, views on digitalisation itself were mixed. Economic operators generally considered that digital tools accelerated procedures, while contracting authorities remained sceptical as to whether e-procurement had genuinely reduced burden or saved time. The evaluation also identified significant structural problems. Although transparency and efficiency had improved, interoperability problems persisted. Procurement platforms often could not connect to national databases such as tax registries, obliging businesses to submit the same documentation repeatedly. Simplification tools such as the ESPD were regarded as overly complex and insufficiently standardised, thereby increasing, rather than reducing, administrative burden.[34]

Integration deficits remain a major obstacle to realising the full benefits of digital procurement. In this context, integration denotes the capacity of e-procurement platforms to exchange data automatically with the back-office systems of contracting authorities – including information-management and enterprise-resource-planning (ERP) systems – and with external public registries; where that capacity is lacking, the same information must be re-entered manually, the 'once-only' principle cannot be honoured, and a genuinely digital-by-default, end-to-end procurement process remains unattainable.[35] The once-only principle holds that businesses and public bodies should have to provide a given item of standard information to the public administration only once, with that data thereafter reused and shared across public bodies – subject to appropriate safeguards – rather than being requested anew at each interaction; in public procurement it is an important means of reducing administrative burden, and

[33] European Commission, Commission Staff Working Document – Evaluation of Directive 2014/23/EU on Concessions, Directive 2014/24/EU on Public Procurement and Directive 2014/25/EU on Utilities, Brussels, 14 October 2025, SWD(2025) 332 final.

[34] *Ibid*., pp. 20 – 21. Cf. Ortiz González, J., *Evaluating the Public Procurement Directives – towards a balanced reform?*, Brussels Matters, online workshop, 27 November 2025.

[35] On integration with back-office and ERP systems as a precondition for an end-to-end, digital-by-default process, see Ferk, P., Ferk, B., *op. cit.* (fn. 13); the limited integration or interoperability among existing procurement frameworks has been identified as a deficiency of the EU system in Ferk, *op. cit.* (fn. 7).

its realisation depends on integrated platforms that support a digital-by-default approach.[36] Research indicates that the internal information systems of contracting authorities frequently lack integration with e-procurement platforms and with other governmental systems, including tax, budgeting, and banking systems.[37] This fragmentation generates inefficiencies, limits data visibility, and prevents seamless workflows across the procurement lifecycle.[38]

At EU level, the integration of digital infrastructure has itself become an explicit policy objective. In its June 2026 European Technological Sovereignty Package – a horizontal initiative spanning cloud, artificial intelligence, data infrastructure, semiconductors and open source – the Commission presented, among other measures, an EU Open Source Strategy aimed at promoting open and interoperable digital ecosystems and reusable digital building blocks for public administrations. Although horizontal in scope rather than specific to public procurement, these initiatives reflect a wider effort to address the fragmentation and interoperability gaps that will also influence the development of digital procurement.[39]

The integration challenges are further examined below through two recent OECD reports. Although the OECD's work does not refer directly to the EU procurement directives, it remains relevant to the EU context: many EU Member States are also members of the OECD, while several others are currently in the process of accession.[40] Moreover, the OECD tends to analyse such topics from

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[36] On the gradual roll-out of the once-only principle in EU public procurement as a means of reducing administrative burden, see Pekolj *et al.*, *op. cit.* (fn. 2).

[37] Cf. OECD, *Improving the organisational structure of public procurement*, OECD Public Governance Reviews, OECD Publishing, Paris, 2023; OECD, *Strengthening the strategic use of public procurement*, OECD Public Governance Reviews, OECD Publishing, Paris, 2023; Milenković, M.; Rašić, M.; Jovančević, R., *Public Procurement of Innovative and Technological Solutions in the EU*, in: Vrček, N.; Koričić, M.; Gradišnik, V. *et al.* (eds.), *2022 - 45th Jubilee International Convention on Information, Communication and Electronic Technology (MIPRO)*, Croatian Society for Information, Communication and Electronic Technology, Rijeka, 2022, pp. 1258 – 1263.

[38] OECD, *Strengthening the strategic use of public procurement*, *op. cit.* (fn. 37).

[39] European Commission, Communication on European Tech Sovereignty, accompanied by an EU Open Source Strategy, COM(2026) 503 final, 3 June 2026; see also the European Commission, Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe's cloud and AI ecosystem (Cloud and AI Development Act), COM(2026) 502 final, 3 June 2026 (procedure 2026/0138(COD)).

[40] OECD, *Members and partners*, https://www.oecd.org/en/about/members-partners.html (1 July 2026).

a broader comparative perspective, which can assist a fuller understanding of the EU context, and it frequently supports its Member States in addressing specific areas for improvement.

The 2025 OECD Report on Implementing the OECD Recommendation on Public Procurement (2020–2024) notes that implementation has taken place amid digital transformation, economic pressure, and supply-chain disruption. These developments have underscored the need for resilient procurement systems, stronger risk management, and enhanced transparency and accountability. Public procurement is increasingly seen as a strategic instrument for broader policy objectives, including sustainability. The report therefore emphasises the need to update the recommendation in light of emerging challenges and opportunities, including digitalisation, the responsible use of artificial intelligence (AI), crisis preparedness, supply-chain resilience, and stronger transparency and competition.[41]

Similarly, the OECD Good Practice Report on Digital Transformation of Public Procurement highlights both the promise and the limits of digital transformation. It advocates an end-to-end approach integrating digital tools across the entire procurement lifecycle, rather than merely automating existing processes. Such a "digital-by-design" approach can enable real-time data sharing, improve transparency, and increase operational efficiency. At the same time, the report identifies persistent barriers, including insufficient digital skills, organisational resistance, weak strategic frameworks, and data-governance gaps. Emerging technologies such as predictive analytics, artificial intelligence, and robotic process automation can improve procurement functions, but only where they are supported by robust data governance and clear institutional leadership.[42]

2.3. State of Digital Infrastructure and Platforms

The European Commission promotes digital procurement as a key instrument for modernising public purchasing in the EU, and several EU-level initiatives

[41] OECD, *Implementing the OECD Recommendation on Public Procurement in OECD and Partner Countries: 2020–2024 Report*, OECD Public Governance Reviews, OECD Publishing, Paris, 2025, https://www.oecd.org/en/publications/implementing-the-oecd-recommendation-on-public-procurement-in-oecd-and-partner-countries_02a46a58-en.html (16 March 2026).

[42] OECD, *Digital Transformation of Public Procurement – Good practice report*, OECD Public Governance Policy Papers, 2025, https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/digital-transformation-of-public-procurement_90ace30d/79651651-en.pdf (16 March 2026).

and infrastructure projects support that objective.[43] Recent analyses suggest that e-procurement has become the standard method for conducting public procurement procedures across the Union.[44]

The EU has established an extensive digital infrastructure centred on Tenders Electronic Daily (TED)[45], the common database for EU procurement opportunities. TED receives information through modules such as SIMAP, which transmit procurement data from national systems to the Publications Office.[46] Yet TED data require substantial cleaning before they can be reliably analysed.[47]

The EU has also developed specific digital instruments to operationalise legislative requirements, including the ESPD[48], the Pan-European Public Procurement On-Line (PEPPOL) e-delivery network[49], e-Certis, the open-source e-procurement platform e-PRIOR, eInvoicing, e-SENS, and the Internal Market Information (IMI) system.[50] However, instruments such as the ESPD and eForms have faced major implementation difficulties, including interoperability constraints, uneven uptake across Member States, and technical and organisational complexity.[51]

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43 For more information, see European Commission, *Digital Procurement*, available at https://single-market-economy.ec.europa.eu/single-market/public-procurement/digital-procurement_en (16 March 2026).

44 European Commission, *Commission Staff Working Document…*, *op. cit.* (fn. 33).

45 Tenders Electronic Daily (TED), available at: ted.europa.eu (16 March 2026).

46 *Ibid*.

47 See Tátrai, T.; Vörösmarty, G.; Juhász, P., *EU public procurements – analysis of Tenders Electronic Daily*, International Journal of Procurement Management, *vol.* 20, no. 2, 2024, pp. 171 – 186.

48 Cf. Bertocchi *et al.*, *op. cit.* (fn. 5), pp. 269 – 287.

49 Schmitz, A.; Mondorf, A.; Wimmer, M. A., *Framework for designing interoperable public service architectures with exemplification along small-scale procurement and PEPPOL*, in: Hagen, L.; Solvak, M.; Hwang, S. (eds.), *Proceedings of the 23rd Annual International Conference on Digital Government Research*, Association for Computing Machinery, New York, 2022, pp. 22 – 34.

50 Bobowski, S.; Gola, J., *E-procurement in the European Union*, The Asia-Pacific Journal of European Union Studies, *vol.* 17, no. 1, 2018, pp. 23 – 35.

51 On ESPD, see, e.g., Fernández Acevedo, R. *et al.*, *Evaluation of the 2014 public procurement directives*, Public Contracts in Legal Globalization Network, 2024, https://research.vu.nl/ws/portalfiles/portal/399452297/PCLG_Network_-_Evaluation_of_the_2014_public_procurement_directives_-_Final_Document.pdf (6 March 2026), pp. 25 – 29. On eForms, see, e.g., Zámbó, Á. B., *eForms – az új uniós hirdetményminták (eForms – the new EU standard forms)*, Közbeszerzési értesítő plusz, *vol.* IV, no. 3, 2022, pp. 38 – 47.

National e-procurement systems generally consist of two layers, which may or may not be integrated: a national notification portal and one or more submission platforms. Their sophistication varies considerably across Member States. The Commission provides a list of national e-procurement portals, but the list is neither fully comprehensive nor entirely consistent, since it conflates notification and submission portals and includes some outdated or non-functioning links.[52] More broadly, many national systems continue to operate in silos and remain disconnected from other government services, increasing friction for businesses.

After the adoption of the 2014 Package, policy attention focused primarily on submission solutions, because notification solutions already existed. Member States then took different approaches: some developed platforms themselves, while others left their development to the market, sometimes subject to national certification. All of these models continue to coexist.

In practice, Member States have adopted three main models of submission platforms: centralised public platforms, hybrid public-private systems, and private certified solutions.[53] Reliable comparative data remain scarce, and also early implementation studies were incomplete. What is clear is that e-procurement platforms vary substantially across the EU and largely reflect national administrative structures.[54] In 2015, more than 300 public and private platforms were estimated to exist[55]; today, no equally precise figure is available. In our view, this supports the argument that the e-procurement market is dynamic and relatively healthy.[56] Additionally, specialised solutions in particular sectors, such as health, may improve efficiency and address sec-

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52 European Commission, *Public procurement in EU countries – national portals*, https://commission.europa.eu/funding-tenders/tools-public-buyers/public-procurement-eu-countries_en#national-portals (18 March 2026).

53 The General Court addressed these models in *Aanbestedingskalender and Others v Commission*, T-138/15, EU:T:2017:675, judgment of 28 September 2017, para. 108. For criticism, see Sanchez-Graells, A., *10 Years On, the CJEU Creates More Uncertainty About the (In)Divisibility of Public Powers and Economic Activities in Public Procurement*, How to Crack a Nut blog, 18 November 2019, https://www.howtocrackanut.com/blog/2019/11/18/cjeu-creates-uncertainty-about-public-powers-and-economic-activities-in-procurement (22 March 2026).

54 Buyse, A.; Dewyngaert, N.; Loozen, N.; Lopez Potes, M.; Simons, G.; Ziemyte, A., *E-Procurement Uptake, Final Report*, prepared for DG GROW, 23 April 2015, p. 10.

55 *Ibid.*, pp. 26, 138, fn. 33; Semple, A., *A Practical Guide to Public Procurement*, Oxford University Press, Oxford, 2015, p. 92, para. 3.60.

56 Semple, *op. cit.* (fn. 55), p. 92, para. 3.60.

tor-specific needs.[57] At the same time, such pluralism has obvious disadvantages in terms of fragmentation.

To address fragmentation at least partially, the Commission launched the PPDS, designed to connect national procurement databases and TED data within a common EU-wide data ecosystem. However, it focuses primarily on connecting notification platforms, while submission systems remain largely outside its scope.[58]

Despite the widespread adoption of e-procurement, the digital procurement landscape in the EU remains fragmented. Member States operate diverse national platforms and technical solutions, often in partnership with private providers. This limits interoperability and complicates cross-border participation. Integration between e-procurement systems and broader governmental digital infrastructures also remains weak. As a consequence, economic operators are often required to submit the same information repeatedly, undermining one of the main promises of digitalisation: administrative simplification. Significant progress has therefore been made, but important improvements in interoperability, data integration, and cross-platform governance are still necessary.[59]

Cross-border interoperability remains incomplete despite standardisation efforts. Although frameworks such as PEPPOL provide important infrastructure for cross-border transactions, existing research points to continuing gaps in standards and implementation. Ensuring that SMEs can participate effectively in cross-border procurement will require further development of interoperability architectures and reference frameworks.[60]

Reliable data on the actual functionality and sophistication of EU e-procurement platforms are still limited. OECD and Commission reports continue to highlight "good practices" in particular states rather than evidence of overall systemic maturity. This suggests that technological progress remains scattered rather than generalised across the EU procurement landscape.

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[57] Racca, G. M., in: Fernández Acevedo *et al.*, *Evaluation of the 2014 public procurement directives*, *op. cit.* (fn. 51), p. 27.

[58] European Commission, *Public Procurement Data Space*, available at https://www.public-procurement-data-space.europa.eu/en/about#what-is-the-ppds (18 March 2025).

[59] Cf. OECD, *The Digital Transformation of Public Procurement in Ireland: A Report on the Current State*, OECD Public Governance Reviews, OECD Publishing, Paris, 2024; OECD, *Implementing the OECD Recommendation on Public Procurement in OECD and Partner Countries: 2020–2024 Report*, *op. cit.* (fn. 41); OECD, *Digital Transformation of Public Procurement – Good practice report*, *op. cit.* (fn. 42), p. 17.

[60] Schmitz, Mondorf, Wimmer, *op. cit.* (fn. 49).

3. KEY OPPORTUNITIES AND PLAUSIBLE EXPECTATIONS

3.1. Electronic Procurement, Digital Procurement, and Digital Transformation

Before turning to emerging technologies, it is necessary to clarify terminology. Analysis of digital public procurement in the EU is complicated by conceptual inconsistency. While the European Commission often uses the terms *electronic procurement* and *digital procurement* interchangeably[61], the OECD adopts a more differentiated framework.[62] Although the OECD's work is not specific to the EU, its relevance to the EU context has already been explained above; here it serves a precise analytical purpose. Distinguishing these terms matters because the EU's tendency to use them interchangeably risks blurring the distinction between the mere digitisation of existing procedures and a genuine, systemic digital transformation, thereby obscuring how much of the latter remains unachieved.

In OECD terminology, *digitisation* refers to the conversion of analogue information and processes into machine-readable formats, enabling their processing by digital technologies such as ERP systems, emails, or websites. *Digitalisation* refers to the use of digital technologies to support or modify existing procurement activities, for example online supplier databases, e-catalogues, or web-enabled electronic data interchange. *Digital transformation*, by contrast, denotes a broader systemic shift in which digital technologies fundamentally reshape procurement processes, organisational structures, and decision-making practices, making possible integrated, data-driven, end-to-end systems.[63]

From that perspective, the more accurate concept for the purposes of this paper is *digital transformation*. Without it, and regardless of what the next legislative reform may bring, a genuine breakthrough is unlikely.

3.2. From e-Procurement 1.0 to 5.0: A Long and Multi-Stage Transformation

The description of digital procurement in terms of successive 'generations' – from e-Procurement 1.0 to 4.0, and prospectively 5.0 – is not unique to public procurement. The 'X.0' shorthand originates in the wider supply-chain and

[61] Cf. European Commission, *Commission Staff Working Document…*, *op. cit.* (fn. 33).

[62] OECD, *Digital Transformation of Public Procurement – Good practice report*, *op. cit.* (fn. 42), pp. 13–14.

[63] *Ibid.*

purchasing literature, where web-based and electronic procurement were analysed as successive stages of technological maturity, and has subsequently been transferred to, and applied in, the public-procurement context. Its use is now well established among scholars, as reflected in the critical literature review by Mavidis and Folinas.[64] The sequence begins with e-Procurement 1.0, denoting electronic beginnings: the passive online publication of information and the mere replacement of paper with scanned or electronic documents.

E-Procurement 2.0 adds electronic submission while remaining document-centred and dependent on PDFs, scanned bids and uploaded signatures. E-Procurement 3.0 supports more integrated, transactional and increasingly end-to-end processes. E-Procurement 4.0, with 5.0 as its prospective extension, denotes data-driven, interoperable and AI-enabled procurement shaped by the tools of the fourth industrial revolution.[65]

The digitalisation of public procurement can be understood through three interrelated layers: first, legally mandated electronic procedures under the 2014 framework; second, comprehensive end-to-end functionalities covering the full procurement cycle; and third, more advanced characteristics associated with AI and data-driven procurement systems.

At the level of legal obligation, Directive 2014/24/EU requires the use of electronic means only in specific stages of the procurement procedure, including publication of notices, electronic access to documentation, e-submission, and electronic invoicing. Beyond these minimum obligations, a genuinely digital system may include broader end-to-end functionalities such as budget and purchase planning, supplier registration and categorisation, authentication, evaluation, preparation and reuse of the ESPD, automatic evaluation, electronic award, e-contracting, e-ordering, e-catalogues, e-payment, contract registers, and contract management.

At the most advanced level, digital procurement systems display features linked to data-driven governance and strategic procurement, including structured data, process automation, data analytics, AI integration, real-time monitoring, interoperability, and the strategic use of procurement data for policy and performance management. Taken together, these layers reflect the progression from legal compliance to fully integrated and intelligent procurement systems.

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[64] On this generational framing in the public-procurement literature, see Mavidis, A.; Folinas, D., *From Public E-Procurement 3.0 to E-Procurement 4.0: A Critical Literature Review*, Sustainability, *vol.* 14, no. 18, 2022, art. 11252; the underlying distinction derives from the wider supply-chain and purchasing literature. See also the literature cited there.

[65] *Ibid.*

As Mavidis and Folinas describe, this evolution aligns with the broader scholarly description of a transition from e-Procurement 3.0 to e-Procurement 4.0, shaped by the tools of the fourth industrial revolution. Research identifies technological readiness, organisational change management, and alignment with strategic policy goals as the main conditions for successful implementation[66], rather than the mere availability of digital technologies.

At the same time, it must be emphasised that some procurement platforms in the EU still rely on functionalities associated with e-Procurement 2.0, and in some cases even 1.0. Many 2.0 systems permit electronic submission but remain document-centred and dependent on PDFs, scanned bids, manually completed forms, and uploaded signatures. They often lack structured data, internal communication features, audit trails, advanced/qualified electronic signing, and interoperability with other systems. Some platforms still display 1.0 characteristics, namely passive online publication and the mere replacement of paper with scanned digital documents. The larger the gap between existing systems and more advanced models, the more difficult the transition becomes. In such circumstances, authorities may need to leapfrog one or even two stages of technological development, which increases organisational, technical, and financial demands.

The technologies associated with Procurement 4.0 could and should support genuine digital transformation while approach of industry 5.0 should also be considered and include sustainable, human-centric and resilient European industry.[67]

However, the gap between the currently mandatory phases of e-procurement and a fully integrated end-to-end lifecycle is too large to be bridged at once. It is therefore unlikely that full end-to-end digital transformation will become a mandatory legal requirement at EU level in the near future. Ongoing developments suggest a cautious approach reflecting both the diversity of Member State capacities and the political sensitivity of imposing high implementation costs. Less ambitious Member States and contracting authorities may therefore

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66 Mavidis, Folinas, *op. cit.* (fn. 64).

67 Deloitte, *Study on up-take of emerging technologies in public procurement*, DG GROW G.4, Req. No. 146, Framework Contract DI/07624 – ABC IV Lot 3 D01.06, Final Report, February 2020, https://interoperable-europe.ec.europa.eu/sites/default/files/news/2020-06/D.01.06_Final_report_v3.00.pdf (18 March 2026); European Commission, *Industry 5.0 – Towards a sustainable, human-centric and resilient European industry*, Publications Office of the European Union, Luxembourg, 2021, https://op.europa.eu/en/publication-detail/-/publication/468a892a-5097-11eb-b59f-01aa75ed71a1/ (31 March 2026).

confine themselves to minimal compliance, perpetuating asymmetries in digital maturity. A hybrid model may emerge in which formal procedural steps occur on official platforms while substantive preparation takes place externally, undermining the coherence of the digital procurement ecosystem.

3.3. Digital Architecture: Centralisation, Integration, and Interoperability

As Bobowski and Gola observe, the digital transformation of EU public procurement has long been shaped by debates on the optimal architecture of e-submission systems.[68] Before the adoption of the 2014 Package, discussion occasionally extended to the possibility of a single EU-wide procurement platform. Although never formally proposed in legislative form, the idea attracted debate in policy, professional, and academic circles. The question is now resurfacing in preparatory work for an expected 2026 legislative proposal.

There are, however, strong reasons for caution regarding centralisation. A single digital infrastructure would have to process a vast volume of procurement data and could concentrate purchasing power in ways that create systemic risks for competition.[69] Highly centralised systems may also generate administrative bottlenecks and reduce operational flexibility through excessive standardisation. Some authors have further argued that they may favour larger suppliers and create entry barriers for SMEs.[70] In addition, the legal, administrative, and digital heterogeneity of Member States, including differing data standards and procurement infrastructures, remains a major obstacle to any single unified system.[71] Centralised procurement structures may also create rigid administrative frameworks that limit flexibility.[72]

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[68] Bobowski, Gola, *op. cit.* (fn. 50).

[69] Cf. Petersen, O. H.; Jensen, M. D.; Bhatti, Y., *The Effect of Procurement Centralization on Government Purchasing Prices: Evidence from a Field Experiment*, International Public Management Journal, *vol.* 25, no. 1, 2022, pp. 24 – 42. The study demonstrates that, although procurement centralisation can generate efficiency gains, it may also entail risks of market distortions and reduced competitive pressure.

[70] Sanchez-Graells, A., *Public procurement by central purchasing bodies, competition and SMEs: towards a more dynamic model?*, in: Risvig Hamer, C.; Comba, M. (eds.), *Centralising Public Procurement*, Edward Elgar, Cheltenham, 2021, pp. 71 – 86.

[71] Tátrai, T.; Vörösmarty, G., *Comparative Analysis of the European Centralised Public Procurement*, Central European Journal of Public Policy, *vol.* 17, no. 2, 2023, pp. 82 – 96.

[72] Cf. Mélon, L.; Spruk, R., *The impact of e-procurement on institutional quality*, Journal of Public Procurement, *vol.* 20, no. 4, 2020, pp. 333 – 375.

A pre-2014 SIGMA/OECD study concluded that decentralised organisational models could function effectively, and that centralisation was not a necessary condition of efficiency.[73] This finding supported arguments against a single EU-level platform.

Current debates instead favour the integration and interoperability of multiple platforms within a coherent European data ecosystem.[74] This model emphasises common data spaces, eForms, improved data quality, and stronger cross-border coordination. A European PPDS could aggregate data from national systems without replacing them. Sector-specific procurement platforms may also continue to develop, supporting a pluralistic architecture of digital procurement governance.[75]

As the EXEP Group observed in its 2020 publication on interoperability in end-to-end e-procurement, interoperability is essential to modern procurement in Europe.[76] Seamless communication between public systems can improve competition, decision-making, transparency, and efficiency. Achieving this requires coordinated action across legal, organisational, semantic, and technical dimensions, with the semantic and organisational levels proving especially difficult. Legislative initiatives, standardisation projects such as PEPPOL and eSENS, and instruments such as the EU Procurement Ontology all point towards more integrated governance.

At the horizontal level, moreover, the Interoperable Europe Act, which entered into force in 2024, has strengthened the legal framework for public-sector interoperability.[77]

In our view, an integrative rather than centralised approach is more likely at EU level. Advancing cross-border interoperability remains a priority if the EU is

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[73] OECD/SIGMA, *Centralised Purchasing Systems in the European Union*, SIGMA Paper No. 47, OECD Publishing, 2011, https://www.sigmaweb.org/content/dam/sigma/en/publications/reports/2011/04/centralised-purchasing-systems-in-the-european-union_g17a1f31/5kgkgqv703xw-en.pdf (25 March 2026).

[74] European Commission, *Interoperability in end-to-end eProcurement*, EXEP Deliverables, Publications Office of the European Union, Luxembourg, 2020, https://op.europa.eu/sl/publication-detail/-/publication/1c578b32-4c82-11ea-b8b7-01aa75ed71a1/language-en (19 March 2026); Da Rosa, *op. cit.* (fn. 28).

[75] Racca, *op. cit.* (fn. 57), pp. 25 – 27.

[76] European Commission, *op. cit.* (fn. 74).

[77] Regulation (EU) 2024/903 of the European Parliament and of the Council of 13 March 2024 laying down measures for a high level of public sector interoperability across the Union (Interoperable Europe Act), OJ L, 2024/903, 22 March 2024, http://data.europa.eu/eli/reg/2024/903/oj.

to create a genuinely integrated procurement market, and future research should continue to examine how architectural frameworks based on standards such as PEPPOL can support SME participation.[78] Earlier assessments of e-procurement uptake reached a similar conclusion, finding that even highly decentralised systems can function effectively where regional and local platforms are interoperable and feed a central one-stop-shop, and that Member States retaining their own platforms still require interoperability and interfaces to such a portal.[79]

The digital transformation of EU public procurement is therefore more likely to proceed through gradual deepening than through radical disruption. Although digital-by-default remains an important normative objective, its practical realisation will be limited by financial, administrative, and institutional constraints. The EU is thus more likely to prioritise interconnected systems based on application programming interfaces (APIs), standardised data models, and harmonised ontologies than to pursue a single EU-wide platform. Interoperability is likely to increase through instruments such as eForms and the gradual operationalisation of the once-only principle, reflecting both the persistence of national fragmentation and the political limits of centralisation.

3.4. Cloud Computing

The implementation of Procurement 4.0 technologies is also linked to the question whether digital solutions should be commercially available off-the-shelf products or custom-built governmental solutions.[80] Cloud computing has become a strategic priority for EU institutions.[81] Cloud computing may be defined as the provision of on-demand network access to a shared pool of managed and

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78 Cf. Schmitz, Mondorf, Wimmer, *op. cit.* (fn. 49).

79 See Buyse *et al.*, *op. cit.* (fn. 54), pp. 123, 129.

80 Schooner, S. L., *Commercial Products and Services: Raising the Market Research Bar or Much Ado about Nothing?*, 2018, https://ssrn.com/abstract=3276365 (18 March 2026); Garland, M., *Vendor-Lock and Lack of Competition in the Government's Software Estate*, 2023, https://netchoice.org/wp-content/uploads/2023/01/NetChoice_Garland_The-Pernicious-Consequences-of-Vendor-Lock.pdf (18 March 2026).

81 Cf. European Commission, *European Commission Cloud Strategy – Cloud as an enabler for the European Commission Digital Strategy*, 2019, https://commission.europa.eu/document/download/3bb440ec-f777-484c-8802-baf08ebb87c0_en?filename=ec_cloud_strategy.pdf (19 March 2026); Ducatel, K.; Michlmayr, T.; Merle, P.; Baskovc, D.; Mestre, F., *The European Commission goes "cloud first": A roadmap towards trusted cloud adoption to seize the opportunities of digital transformation for EU institutions and agencies*, Cyber Security: A Peer-Reviewed Journal, *vol.* 3, no. 3, 2020, pp. 220 – 232;

scalable IT resources – hardware (infrastructure as a service, IaaS), development platforms (platform as a service, PaaS) and applications (software as a service, SaaS) – on a pay-per-use basis, whereby users access these resources remotely over the internet rather than owning, managing or operating the underlying infrastructure.[82] The strategic importance of cloud computing has also been underscored by the European Commission's proposal for a Cloud and AI Development Act (part of the European Technological Sovereignty Package in June 2026)[83], recognising that cloud procurement is not merely a matter of IT modernisation but an instrument of digital sovereignty and strategic autonomy.

Cloud computing offers important opportunities for public-sector modernisation, but realising that potential requires more than simple technological adoption. The literature shows that successful cloud procurement depends on appropriate policy frameworks[84], organisational capacity, robust data governance, and careful financial analysis.[85] Public authorities face distinctive challenges in comparison with private actors, including regulatory compliance, security, and public accountability.[86] Research therefore suggests that procurement rules must adapt to the specific characteristics of cloud services.[87] Public bodies must also establish governance frameworks capable of protecting sensitive data while still allowing innovation.[88]

Rossa, S., *Innovative Procurement and Cybersecurity*, EPPPL, *vol.* 20, no. 3, 2025, pp. 287 – 302.

82 Schneider, S.; Sunyaev, A., *Determinant factors of cloud-sourcing decisions: reflecting on the IT outsourcing literature in the era of cloud computing*, Journal of Information Technology, *vol*. 31, no. 1, 2016, pp. 1 – 31.

83 Cloud and AI Development Act, *op. cit.* (fn. 39).

84 Cf. United States Government Accountability Office, *Cloud Computing – Agencies Need to Address Key OMB Procurement Requirements*, 2024, https://www.gao.gov/assets/gao-24-106137.pdf (5 March 2026).

85 Sallehudin, H.; Razak, R. C.; Ismail, M.; Fadzil, A. F. M.; Baker, R., *Cloud Computing Implementation in the Public Sector: Factors and Impact*, Asia-Pacific Journal of Information Technology and Multimedia, *vol.* 7, no. 2-2, 2018, pp. 27 – 42.

86 McGillivray, K., *Government Cloud Procurement – Contracts, Data Protection, and the Quest for Compliance*, Cambridge University Press, Cambridge, 2022, pp. 91 ff.

87 United States Center for Digital Government, *Best Practice Guide for Cloud and As-a-Service Procurements*, https://bja.ojp.gov/sites/g/files/xyckuh186/files/media/document/cdg16_xaas_procurement_guide_i.pdf (5 March 2026).

88 Ghaffari-Tabrizi, O., *Interoperable Cloud, Innovative Competition: Advancing Artificial Intelligence and Emerging Technologies via Public Sector Procurement*, 2025, https://ssrn.com/abstract=5272590; Tátrai, T.; Boykin, E.; McCue, C.; Prier, E., *Innovation and*

Given its growing role as foundational infrastructure for sustainability, AI, and digital public services, cloud procurement is likely to remain very important element of government IT strategy and closely connected to the future development of public procurement.

3.5. Data-Driven Procurement and Analytics

According to the OECD, deficiencies in data quality and availability continue to limit the development of data-driven procurement. Although e-procurement platforms generate substantial volumes of data, inconsistencies in data capture, incomplete records, and weak standardisation constrain their analytical use. Improving data quality and availability, possibly through mandatory modules and stronger system integration, should in view of OECD therefore be treated as a priority.[89]

Big data analytics represents an important future direction for strengthening accountability and improving decision-making in procurement.[90] It offers significant potential for detecting irregularities and enhancing oversight.[91] Yet such analytics presuppose structured, machine-readable data.

The EU Open Data Directive[92] promotes transparency and economic growth by requiring public-sector data to be accessible, machine-readable, and, where appropriate, available via APIs. This logic should be implemented coherently alongside future procurement reform if big data analytics is to become operational in practice.

Since the adoption of the 2014 Package, transparency and publication have improved, but significant deficiencies remain in data accuracy, particularly regarding award criteria and contract values. Enhanced data governance and continuous monitoring are therefore essential, and the PPDS may provide a

Public Procurement – Introduction to the Special Issue, EPPPL, *vol.* 20, no. 1, 2025, pp. 6 – 7.

89 OECD, *Strengthening the strategic use of public procurement*, *op. cit.* (fn. 37).

90 Sanda, M.-R.; Siminică, M.-I.; Avram, C.-D.; Popescu, L., *Ghosts in the Machine: How Big Data Analytics Can Be Used to Strengthen Online Public Procurement Accountability*, Sustainability, *vol.* 16, no. 9, 2024, art. 3698.

91 *Ibid.*

92 Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ L 172, 26 June 2019, pp. 56 – 83.

pathway to greater integration across Member States.[93] In line with this, the 2015 assessment of e-Procurement uptake recommended coherent monitoring at Member-State level, based on common definitions and key indicators, and noted the absence of integrated monitoring of data across platforms.[94]

Knowledge graphs and semantic technologies offer advanced possibilities for integrating heterogeneous procurement data. Continued standardisation of data formats, improvements in metadata quality, and the establishment of data-governance frameworks will make more sophisticated analytical applications possible.[95]

Full implementation of the Once-Only Principle (OOP) across the EU could significantly reduce administrative burden for businesses and citizens.[96] Instruments such as the Virtual Company Dossier[97] or the reusable ESPD[98] illustrate this potential. The introduction of European Business Wallets can also be expected to influence this development.[99] Future efforts should therefore extend OOP infrastructure to additional procurement processes, improve data exchange

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93 Da Rosa, I.; Tátrai, T.; Tresó, D., *Evaluation of Transparency and Integrity – 2014 Public Procurement Directives*, Publications Office of the European Union, Luxembourg, 2025.

94 Buyse *et al.*, *op. cit.* (fn. 54), pp. 137 – 140 and 156.

95 E.g. the TheyBuyForYou knowledge graph demonstrates how semantic web technologies can address technical heterogeneity, data quality issues, and missing links across national procurement systems. By enabling cross-lingual document search and data integration across borders, these technologies lower barriers to entry for smaller suppliers and encourage healthier competition, particularly for cross-border bids. See: Soylu *et al.*, *op. cit.* (fn. 5), pp. 265 – 291.

96 Douloudis, K.; Siapera, M.; Prentza, A., *Improving Electronic Public Procurement Using the Once-Only Principle: Connecting the Greek Electronic Single Procurement Document System to the Once-Only Principle Project's Infrastructure, Implementing the eProcurement Pilot*, in: Loukis, E. *et al.* (eds.), *Proceedings of the 14th International Conference on Theory and Practice of Electronic Governance*, Association for Computing Machinery, New York, 2022, pp. 238 – 245; Tepandi, J.; Rotuna, C.; Sellitto, G. P.; Fieten, S.; Prentza, A., *The Technical Challenges in OOP Application Across the European Union and the TOOP OOP Architecture*, in: Krimmer, R.; Prentza, A.; Mamrot, S. (eds.), *The Once-Only Principle*, Springer, Cham, 2021, pp. 141 – 163.

97 Racca, G. M., *Digital Transformation for Effective E-Procurement*, in: Risvig Hamer, C.; Andhov, M.; Bertelsen, E.; Caranta, R. (eds.), *Into the Northern Light: In Memory of Steen Treumer*, Ex Tuto Publishing, Copenhagen, 2022, p. 219.

98 Racca, *op. cit.* (fn. 57), p. 28.

99 Proposal for a Regulation of the European Parliament and of the Council on the establishment of European Business Wallets, COM(2025) 838 final, 19 November 2025 (procedure 2025/0358(COD)).

among public services, and ensure both legal and technical interoperability across jurisdictions.[100] They should also expand analytical capacities to identify patterns, detect anomalies, and support evidence-based policy and operational improvements.[101] Standardisation must continue to evolve, extending beyond document formats to include data schemas, APIs, and semantic ontologies.[102]

A key observable trend is thus the expansion of data-driven procurement governance. The PPDS should enable structured aggregation of TED and national data, facilitating benchmarking, the monitoring of EU funds, and the detection of systemic risks such as corruption and market concentration. In this sense, digitalisation is likely to strengthen analytical and supervisory functions more than it simplifies individual procurement procedures. Further developments may include automated verification and compliance mechanisms[103], allowing procurement systems to connect with business registries, tax databases, and beneficial ownership tools in order to verify exclusion grounds and selection criteria. Algorithmic risk-scoring and enhanced audit trails may improve traceability and *ex post* control. Nevertheless, these developments will primarily reinforce compliance and oversight rather than significantly improve procurement design or strategic decision-making. Nor is digitalisation alone likely to increase cross-border participation substantially, since legal complexity, language barriers, and administrative burdens will remain.

3.6. Robotic Process Automation, Artificial Intelligence, and Machine Learning

AI is already beginning to reshape public procurement. Research reports measurable gains, including faster market analysis, improved drafting of specifications, streamlined workflows, and reduced administrative burden.[104] AI is

[100] Douloudis, Siapera, Prentza, *op. cit.* (fn. 96).

[101] Sanda *et al.*, *op. cit.* (fn. 90).

[102] Soylu *et al.*, *op. cit.* (fn. 5).

[103] As an example, cf. Moretti, A., *Artificial Intelligence in Article 30 of the Public Contracts Code*, EPPPL, *vol.* 20, no. 4, 2025, pp. 354 – 361.

[104] Iders-Bankovs, M.; Politika, V.; Pundure, J.; Järvis, M.; Ziemelis, M., *Public procurement in age of AI: challenges and opportunities*, in: *Engineering for Rural Development 2025*, Latvia University of Life Sciences and Technologies, Jelgava, 2025, pp. 968 – 975. For comparative analysis of good practices see also Ayibam, J., *Artificial Intelligence in Public Procurement: Legal Frameworks, Ethical Challenges, and Policy Solutions for Transparent and Efficient Governance*, Alkebulan: A Journal of West and East African Studies, *vol.* 5, no. 2, 2025, pp. 54 – 69.

therefore likely to become increasingly important for future procurement systems. However, its effective deployment requires continuous monitoring to ensure fairness, efficiency, and adaptability to legal and market developments. Future applications should be accompanied by workforce upskilling, stronger data systems, and regulatory integration consistent with broader EU digital transformation objectives.[105] AI is being considered or implemented globally across all phases of procurement[106], but its use also raises a series of important legal and governance concerns, including the procurement of AI solutions themselves[107], ethical risks[108], algorithmic transparency[109], governance[110], and security.[111]

Machine learning is a subset of AI in which computer systems learn from data through algorithmic and statistical methods rather than through explicitly programmed rules. It enables systems to derive inferences from observed patterns without direct human instruction.[112] Functionally, it is especially suited to classification and prediction problems involving large volumes of data.[113]

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[105] *Ibid*.

[106] Cui, R.; Li, M.; Zhang, S., *AI and Procurement*, Manufacturing & Service Operations Management, *vol*. 24, no. 2, 2022, pp. 691 – 706; Siciliani, L.; Taccardi, V.; Basile, P.; Di Ciano, M.; Lops, P., *AI-based decision support system for public procurement*, Information Systems, *vol.* 119, 2023, art. 102284; Alozie, M., *Generative AI in Procurement: Rethinking Bid Evaluation, Fairness and Transparency in Engineering and Construction Contracts*, World Journal of Advanced Research and Reviews, *vol.* 24, no. 3, 2024, pp. 3551 – 3567.

[107] Valcárcel Fernández, P., *Relevance of procurement law for the use of AI in public administration*, in: Krönke, C.; Valcárcel Fernández, P. (eds.), *Buying AI: The Legal Framework for Public Procurement of Artificial Intelligence in the EU*, Edward Elgar, Cheltenham, 2025, pp. 1 – 11.

[108] Ayibam, *op. cit.* (fn. 104), pp. 54 – 69.

[109] Coglianese, C., *Procurement and Artificial Intelligence*, in: Paul, R.; Cobbe, J.; Carmel, E. (eds.), *Handbook on Public Policy and Artificial Intelligence*, Edward Elgar, Cheltenham, 2024, pp. 235 – 248.

[110] Sanchez-Graells, A., *Governance of AI procurement in the UK*, in: Krönke, C.; Valcárcel Fernández, P. (eds.), *Buying AI: The Legal Framework for Public Procurement of Artificial Intelligence in the EU*, Edward Elgar, Cheltenham, 2025, pp. 282 – 294.

[111] Dawson, E.; Christensen, S.; Duncan, W.; Black, P. J.; Foo, E.; Du, R., *Security and Legal Issues in E-Tendering*, CRC for Construction Innovation, 2005, http://www.construction-innovation.info/images/pdfs/Research_library/ResearchLibraryA/Project_Reports/Security_and_Legal_Issues_in_eTendering.pdf (25 March 2026).

[112] For more information, see Sanchez-Graells, A., *Digital Technologies and Public Procurement – Gatekeeping and Experimentation in Digital Public Governance*, Oxford University Press, Oxford, 2024, p. 138. See also references listed there.

[113] Deloitte, *op. cit.* (fn. 67), p. 14.

Robotic process automation (RPA), by contrast, uses software to perform repetitive, rule-based tasks such as form completion, data entry, web scraping, and document processing. Unlike AI, RPA does not make autonomous decisions; it merely reproduces predefined user actions within existing systems.[114]

In our view, AI will increasingly be used as a support tool, especially for drafting tender documents, identifying anomalies, screening offers, and detecting potential collusion. Fully automated decision-making in procurement procedures, however, is unlikely to become a reality within the next decade. The legal framework of EU public procurement, grounded in transparency, equal treatment, and accountability, requires human responsibility for key decisions. Risks of algorithmic bias, limited explainability, and the demands of judicial review further militate against autonomous award decisions. Automation is therefore likely to remain partial and controlled. Moreover, unless the procurement lifecycle is based on structured, machine-readable data, the transformative potential of AI will remain limited. Without integration into official systems, contracting authorities and economic operators will increasingly rely on commercial AI tools, thereby generating further fragmentation and reducing standardisation.

A further dimension, distinct from the use of AI as a tool within procurement, concerns the procurement of AI systems themselves. As Valcárcel Fernández observes, public procurement law has been something of a blind spot in the broader legal debate on AI, even though it functions as a key gatekeeper: procurement rules can act either as a catalyst or as a barrier to the adoption of AI and other digital-governance solutions by the public sector. On this view, the role of public procurement in the digital transition remains largely unclear, and the extent to which the current rules are fit for purpose in the new digital context has yet to be determined.[115] These concerns are reinforced by the EU AI Act, which, although it does not regulate public procurement directly, will shape how contracting authorities acquire and deploy AI systems, particularly those classified as high-risk.[116] In May 2026, the European Parliament and the Council reached a political agreement on the Digital Omnibus on AI, a set of targeted amendments intended to simplify the AI Act.[117] Comparative scholarship points

[114] *Ibid.*

[115] Valcárcel Fernández, *op. cit.* (fn. 107), pp. 5 – 7.

[116] *Ibid.*, p. 5. AI in the EU is regulated by Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act), OJ L, 2024/1689, 12 July 2024.

[117] European Commission, *EU agrees to simplify AI rules to boost innovation and ban 'nudification' apps to protect citizens*, press release IP/26/1024, 7 May 2026, https://ec.europa.eu/commission/presscorner/detail/en/ip_26_1024 (30 June 2026).

in the same direction: analyses of national approaches – such as the governance of AI procurement in the United Kingdom examined by Sanchez-Graells[118], and the Italian experience discussed by Racca[119] – suggest that, absent dedicated guidance, contracting authorities face considerable uncertainty in translating general procurement rules into the safe and accountable acquisition of AI.

These difficulties are compounded by integrity and corruption risks specific to the acquisition of AI, which are equally relevant for the EU as its contracting authorities turn to the acquisition of such systems. Although developed in the context of United States federal procurement, Tillipman's analysis is instructive in this respect: she warns that authorities risk 'buying blind' – acquiring AI systems without adequate transparency, audit rights, testing requirements or the in-house expertise needed to understand them – so that 'risky buying' translates directly into 'risky deployment'. Because AI is a layered, data-dependent technology, risks may arise at the level of infrastructure, model design, customisation, integration or weak human oversight, and they fall into two broad categories: corruption risks, such as AI-generated fraud, prompt injection, the gaming of automated evaluations, algorithmic collusion and organisational conflicts of interest; and wider integrity risks, such as bias, model drift, hallucinations, opacity, automation bias, contractor lock-in, promotional 'buy-in' pricing that fosters behavioural dependency, and the erosion of auditability and workforce competence. Where reliance on commercial acquisition leaves 'regulation by contract' as the principal safeguard, these risks are inadequately addressed; mitigation requires stronger contractual transparency and audit rights, independent verification and red-teaming, documented human review for high-risk uses, and investment in an AI-literate procurement workforce. These concerns will only grow in significance as contracting authorities begin to acquire AI systems.[120] For the EU specifically, these questions are examined in the 2025 edited volume *Buying AI: The Legal Framework for Public Procurement of Artificial Intelligence in the EU*, which brings together comparative and thematic analyses of how public bodies in the Member States acquire AI systems under EU public procurement law.[121]

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[118] Sanchez-Graells, *op. cit.* (fn. 110), pp. 282 – 294.

[119] Racca, G. M., *Country report on Italy*, in: Krönke, C.; Valcárcel Fernández, P. (eds.), *Buying AI: The Legal Framework for Public Procurement of Artificial Intelligence in the EU*, Edward Elgar, Cheltenham, 2025, pp. 256 – 281.

[120] Tillipman, J., *Buying Blind: Corruption Risk and the Erosion of Oversight in Federal AI Procurement*, Public Contract Law Journal, *vol.* 55, no. 2, 2026, pp. 35 – 63.

[121] Krönke, C.; Valcárcel Fernández, P. (eds.), *Buying AI: The Legal Framework for Public Procurement of Artificial Intelligence in the EU*, Edward Elgar, Cheltenham, 2025.

3.7. Blockchain and Smart Contracts

Blockchain technology and smart contracts have also been explored as possible tools for increasing transparency, security, and automation in procurement. Blockchain may help address challenges related to manual management, open data, anti-corruption efforts, process efficiency, and archiving, while smart contracts may support a higher degree of procedural automation.[122] Practical implementation, however, remains exploratory.

Future research should continue to examine the potential of blockchain for ensuring data integrity, enabling secure multi-party transactions, and supporting contract execution through smart contracts, while at the same time addressing the associated legal, technical, and organisational challenges.[123]

Even so, we consider widespread adoption unlikely in the next decade. Although blockchain continues to attract attention, including at EU level[124], existing infrastructure investments, as well as concerns relating to energy use, scalability, and uncertain cost-benefit outcomes, limit its prospects. Blockchain may thus find niche applications, but it is unlikely to become a transformative technology across the procurement ecosystem.

3.8. Additional Technologies

A 2020 Deloitte study identified several other emerging technologies relevant to procurement, including the Internet of Things, 3D printing, robotics and drones, and augmented and virtual reality.[125] Racca e.g. has additionally highlighted the possible relevance of Building Information Modelling (BIM)[126], to list just a few additional possibilities.

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[122] Papa Diadia, B.; Tamgno, J. K.; Kora, A. D., *Review of Dematerialization Models and Systems in Public Procurement*, in: *5th International Conference on Networking, Information Systems and Security (NISS)*, IEEE, Bandung, 2022, pp. 1 – 6; Rodríguez Bolívar, M. P.; Prados Prados, M., *Open Technologies for Public Tendering: Blockchain Technology Impact on Transparency and Efficiency of Public Procurement Processes*, in: Janssen, M.; Csáki, C.; Lindgren, I.; Loukis, E.; Melin, U.; Viale Pereira, G.; Rodríguez Bolívar, M. P.; Tambouris, E. (eds.), *Electronic Government: EGOV 2022, Lecture Notes in Computer Science*, *vol.* 13391, Springer, Cham, 2022, pp. 196 – 211.

[123] Papa Diadia, Tamgno, Kora, *op. cit.* (fn. 122).

[124] Cf. Peiró Baquedano, A. I., *The European Blockchain Services Infrastructure – Use Cases and Potential Risks*, EPPPL, *vol.* 19, no. 3, 2024, pp. 198 – 204.

[125] Deloitte, *op. cit.* (fn. 67).

[126] Racca, *op. cit.* (fn. 97), p. 227.

Although these technologies may become important in specific contexts, they do not appear at present to have the same transformative potential for procurement systems as the technologies discussed above. They are therefore not examined in detail here. That said, their possible future relevance should not be dismissed, and any categorisation of "key" technologies must remain provisional in light of the speed of technological development.

3.9. Strategic and Innovation-Oriented Procurement

Public procurement of innovative and technological solutions can serve as an important strategic instrument for stimulating research and development, supporting economic recovery, and accelerating digital transformation.[127] Future policy should therefore focus more strongly on innovation procurement models that prioritise long-term public value over short-term cost savings.[128]

Future frameworks should make it easier to procure products, services, or processes that are genuinely new to the market and display meaningful innovative features, rather than merely purchasing already finished solutions.[129] In this way, procurement could contribute more effectively to digital transformation and the wider development of digital economies in Europe.

Valadares Tavares and Arruda have suggested exploring alternative models for the governance of public contracts for technological services, including models that remain compatible with EU directives while making better use of tools such as electronic catalogues.[130]

However, past experience shows the limits of merely harmonising rules through a single specialised procedure, such as the innovation partnership under Article 31 of Directive 2014/24/EU.[131] If innovation procurement is to play a more meaningful role in future reform, more ambitious steps will be required.

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[127] Milenković, Rašić, Jovančević, *op. cit.* (fn. 37); Morais, C. R.; Santos, A., *The definition and monitorization of innovation procurement policies in the EU Countries*, European Public & Social Innovation Review, *vol.* 8, no. 1, 2023, pp. 1 – 19.

[128] Morais, Santos, *op. cit.* (fn. 127).

[129] Milenković, Rašić, Jovančević, *op. cit.* (fn. 37).

[130] Valadares Tavares, L.; Arruda, P., *A new approach to public contracting of technological services*, Innovation: The European Journal of Social Science Research, *vol.* 38, no. 2, 2025, pp. 771 – 787.

[131] Cerqueira Gomes, P., *EU Public Procurement and Innovation: The Innovation Partnership Procedure and Harmonization Challenges*, Edward Elgar, Cheltenham, 2021, pp. 1 – 2, 107 ff.

3.10. Skills, Governance and Institutional Capacity

Strengthening the capacity of the public procurement workforce is a basic condition for successful digital transformation.[132] Recognition of procurement as a professional function and the development of competency frameworks are important steps, but substantial capacity-building efforts remain necessary.[133]

The effective deployment of advanced technologies such as AI requires not only technical tools, but also better-qualified personnel, more advanced data-management systems, and the ability to integrate regulatory requirements into practice.[134] Training initiatives must therefore address not only the technical use of digital platforms, but also broader competences in data analysis, strategic procurement, innovation procurement, and change management.[135]

4. FUTURE DIRECTIONS AND CONCLUDING REMARKS

The digitalisation of EU public procurement remains an unfinished and uneven process rather than a completed reform. Although the regulatory framework introduced since 2014 has established important foundations for electronic procurement, implementation across Member States has been fragmented and shaped by differing administrative capacities, institutional legacies, and resource constraints. As a result, the gap between formal compliance with mandatory e-procurement requirements and genuinely integrated, data-driven procurement systems remains substantial.

The likely future directions of EU public procurement are analysed throughout this paper: rather than being treated in a single dedicated section, they are developed within each subsection of the previous section, in relation to the specific instruments and technologies examined there. This concluding section does not introduce new analysis but draws those threads together and summaris-

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[132] OECD, *Professionalising the Public Procurement Workforce: A Review of Current Initiatives and Challenges*, OECD Public Governance Policy Papers, no. 26, OECD Publishing, Paris, 2023, https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/01/professionalising-the-public-procurement-workforce_aea552cb/e2eda150-en.pdf (25 March 2026).

[133] *Ibid*.

[134] Iders-Bankovs *et al.*, *op. cit.* (fn. 104).

[135] Dobrotă, E. M., *Post-COVID Strategies in Public Procurement*, in: Pamfilie, R.; Dinu, V.; Tăchiciu, L.; Pleşea, D.; Vasiliu, C. (eds.), *7th BASIQ International Conference on New Trends in Sustainable Business and Consumption*, ASE, Bucharest, 2021, pp. 510 – 518.

es the future directions identified in relation to the principal instruments and technologies examined. They may be summarised as follows. On terminology (Section 3.1), a clearer separation of digitisation, digitalisation and digital transformation is required if progress is to be assessed honestly. The staged model (Section 3.2) points to continued but uneven progression from e-Procurement 1.0 and 2.0 towards 4.0 and 5.0, with many systems still to advance. On digital architecture (Section 3.3), an integrative and interoperable model — built, *inter alia*, on APIs, common data spaces, eForms and the Public Procurement Data Space — is more likely than a single EU-wide platform. Cloud computing (Section 3.4) will increasingly be treated as a matter of digital sovereignty, with public procurement serving as a demand-side lever. Data-driven procurement (Section 3.5) will expand chiefly by strengthening oversight, benchmarking and anomaly detection, conditional on better data quality and the fuller roll-out of the once-only principle. Artificial intelligence (Section 3.6) is likely to serve as a support tool rather than as an autonomous decision-maker, while raising distinct integrity and corruption risks in the acquisition of AI systems. Blockchain and smart contracts (Section 3.7) remain exploratory and unlikely to achieve widespread adoption within the next decade. Among the additional technologies (Section 3.8), none yet displays comparable transformative potential, although this may change. Strategic and innovation-oriented procurement (Section 3.9) calls for more ambitious models that prioritise long-term public value over short-term savings. Finally, none of these developments can succeed without corresponding investment in skills, governance and institutional capacity (Section 3.10). More broadly, as discussed in Section 2.1 above, the future development of digital public procurement will also be shaped by the wider body of EU sectoral legislation governing information and communication technologies.

The central tension lies between ambitious policy objectives and practical institutional realities. A fully unified EU procurement system is neither politically nor administratively realistic given the deep entrenchment of national legal, organisational, and technological structures. Consequently, the more plausible trajectory is one of gradual integration through standardised data models, interoperability frameworks, and enhanced data exchange rather than through centralisation. Yet this approach also carries limits: fragmented implementation risks preserving asymmetries in digital maturity and encouraging hybrid practices in which formal procedures take place on official platforms while substantive preparation and analysis are conducted through external tools.

Emerging technologies, particularly artificial intelligence and data analytics, offer important opportunities to improve drafting, monitoring, verification, and anomaly detection. However, their transformative potential will remain constrained unless they are embedded within official systems and supported

by structured, machine-readable data across the procurement lifecycle. In the absence of such integration, reliance on external commercial solutions is likely to increase, further weakening coherence and standardisation.

In the near term, the most realistic expectation is incremental rather than transformative change. Progress is likely to take the form of improved data quality, stronger interoperability, enhanced oversight, and gradual upskilling of the procurement workforce, rather than the mandatory and rapid emergence of a fully digital-by-default, end-to-end system across the Union. Meaningful progress will therefore depend not only on future legislation or technological availability, but on sustained institutional commitment, investment in organisational capacity, and coordinated action across legislative, technological, organisational, and human dimensions.

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Sažetak

Petra Ferk *

DIGITALNA TRANSFORMACIJA JAVNE NABAVE U EUROPSKOJ UNIJI: VAŽEĆI ZAKONODAVNI OKVIR, STANJE PROVEDBE I BUDUĆI SMJEROVI

U radu se analizira paradoks digitalizacije javne nabave u Europskoj uniji: iako je od 2014. uspostavljena opsežna elektronička infrastruktura, stvarna transformacija ostaje ograničena zbog neujednačene provedbe u državama članicama. U bližoj budućnosti razvoj će vjerojatno biti usmjeren na analitiku podataka, interoperabilnost i mehanizme nadzora, a ne na obvezne, uistinu digitalne i cjelovite sustave s integriranom umjetnom inteligencijom. Ne ostvari li se to, javni naručitelji će se sve više oslanjati na vanjska rješenja, čime će se pojačati upravo ona rascjepkanost koju je politika EU-a nastojala ukloniti. Za smislen napredak bit će potrebno usklađeno zakonodavno, tehnološko, organizacijsko i kadrovsko djelovanje.

Ključne riječi: javna nabava u EU-u; digitalna transformacija; interoperabilnost; umjetna inteligencija (UI); analitika podataka

* Dr. sc. Petra Ferk, izvanredna profesorica, Inštitut za javno-zasebno partnerstvo, Ukmarjeva 2, 1000 Ljubljana, Slovenija; Nova univerza, Mestni trg 23, 1000 Ljubljana, Slovenija; petra.ferk@pppforum.si;
ORCID ID: orcid.org/0000-0002-8682-008X