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AND AGENCIES

EUROPEAN COMMISSION

COMMUNICATION FROM THE COMMISSION

Public Procurement: A data space to improve public spending, boost data-driven policy-making and improve access to tenders for SMEs

(2023/C 98 I/01)

1. Introducing the European public procurement data space

Every year in the EU, over 250 000 public authorities spend around EUR 2 trillion (around 13,6 % of GDP) on the purchase of services, works and supplies. From new roads to tablets for pupils or equipment for hospitals: Public authorities are the main buyers in many key sectors such as energy, transport, infrastructure, waste management, social protection, health, defence and education services.

By making the right purchasing choices, the public sector can boost jobs, growth, and investment in Europe and create a more innovative, competitive, energy-efficient, and socially inclusive economy. This can support key policies at national and EU level, such the recovery from the pandemic, the twin transitions, the strategic autonomy of the EU and its digital leadership.

To unlock the full potential of public procurement, access to data and the ability to analyse it are essential. However, data from only 20 % of all call for tenders as submitted by public buyers is available and searchable for analysis in one place. The remaining 80 % are spread, in different formats, at national or regional level and difficult or impossible to re-use for policy, transparency and better spending purposes. In other words, public procurement is rich in data, but poor in making it work for taxpayers, policy makers and public buyers.

The Commission's public procurement data initiative aims to harness the power of data available throughout the EU thanks to a Public Procurement Data Space (hereafter: 'PPDS'), one of the first common EU data spaces in a specific area to emerge from the EU strategy for data ⁽¹⁾.

This data space will revolutionise the access to and use of public procurement data:

- It will create a platform at EU level to access for the first time public procurement data scattered so far at EU, national and regional level.
- It will considerably improve data quality, availability and completeness, through close cooperation between the Commission and Member States and the introduction of the new eForms ⁽²⁾, which will allow public buyers to provide information in a more structured way.

⁽¹⁾ A European strategy for data, COM (2020) 66 final, Brussels, 19.2.2020.

⁽²⁾ Commission Implementing Regulation (EU) 2019/1780 establishing standard forms for the publication of notices in the field of public procurement and repealing Implementing Regulation (EU) 2015/1986, published on 25 October 2019. The Regulation and the extended version of its annex in the Excel file can be found here <https://ec.europa.eu/docsroom/documents/38172>. eForms will replace the current Standard Forms (see Commission Implementing Regulation (EU) No 2015/1986, published on 11 November 2015 (<https://simap.ted.europa.eu/standard-forms-for-public-procurement>)).

- This wealth of data will be combined with an analytics toolset including advanced technologies such as Artificial Intelligence (AI), for example in the form of Machine Learning (ML) and Natural Language Processing (NLP).

Integrated data combined with the use of state-of-the-art and emerging analytics technologies will not only transform public procurement, but also give new and valuable insights to public buyers, policy-makers, businesses and interested citizens alike.

Public buyers in Member States will get better value for money and more tools to target public funds towards policy priorities such as the green and social economy. For example, insights gained from the PPDS will make it much easier for public buyers to

- team up and buy in bulk to obtain better prices and higher quality;
- generate more bids per call for tenders by making calls more attractive for bidders, especially for SMEs and start-ups;
- fight collusion and corruption, as well as other criminal acts, by detecting suspicious patterns;
- benchmark themselves more accurately against their peers and exchange knowledge, for instance with the aim of procuring more green, social and innovative products and services;
- through the further digitalisation and emerging technologies that it brings about, automate tasks, bringing about considerable operational savings.

The PPDS will also cut red tape for public buyers and Member States when complying with various reporting obligations. For example, it will be much less burdensome to

- report on the compliance with key policies such as green, social and innovative procurement, e.g. the compliance with the targets set out in the Clean Vehicle Directive for procuring clean vehicles;
- prove performance under the national plans of the Recovery and Resilience Facility (RRF) and monitor the use of other EU funds in real time;
- track the identity of contractors and sub-contractors, including their ultimate beneficial owners in order to protect the integrity of public procurement procedures as e.g. required by the RRF Regulation ^(¹).

Policy makers at EU, national and regional level will gain a wealth of insights that will enable them to predict future trends, e.g. when a certain percentage of publicly procured vehicles will be emission-free and manage crises better by monitoring trade flows generated by public buyers in near real-time, thereby making the EU more resilient.

Companies, and SMEs in particular, will have an easy-to-use portal that gives them access to a much greater number of open call for tenders with better data quality. That will allow them to easily identify potentially relevant calls on time and use analytics tools to plan ahead and focus their resources on the most promising ones. For example, bidders could single out buyers that focus on innovative and sustainable procurement. Companies, and SMEs in particular, will also benefit if public buyers use the new insights available to them to make calls for tenders more accessible.

Citizens, civil society, taxpayers and other interested stakeholders will have access to much more public procurement data than before, thereby improving transparency and accountability of public spending.

These are but a few examples of how clever pooling and analysis of public procurement data can unlock the potential of public spending to accelerate the twin green and digital transitions, the recovery from the COVID-19 pandemic and support other policy goals such as social inclusion and energy efficiency. And this is only the beginning: given the high number of ecosystems concerned by public procurement and the amount of data to be analysed, the impact of AI in this field has a potential that we can only see a glimpse of so far.

The PPDS will be set up progressively. The objective is to have the basic architecture and analytics toolkit in place and procurement data published at EU level available in the system by mid-2023. By the end of 2024, all participating national publication portals would be connected, historic data published at EU level integrated and the analytics toolkit expanded. As of 2025, the system could establish links with additional external data sources.

⁽¹⁾ Article 22(2)(d) of Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility (OJ L 57, 18.2.2021, p. 17).

2. The Public procurement data landscape today

Procurement data published at EU level

Procurement expenditure is regulated by the Public Procurement Directives, ⁽⁴⁾ which provide rules on the organisation of procurement procedures and the publication of data generated thereby for higher-value contracts ⁽⁵⁾ (hereafter: 'above the EU thresholds'). Procedures above the EU thresholds account for approximately 20 % of all public procurement contracts. Public buyers at local, regional and national level must publish data on the notification and awards steps of these procedures on the on the EU website Tenders Electronic Daily ⁽⁶⁾ (hereafter: 'TED') according to the technical specifications provided by the Publications Office of the European Union ⁽⁷⁾. The publication obligation does currently not cover the whole procurement cycle, e.g. in particular the post-award phases.

The current forms for publication on TED will soon to be replaced by eForms ⁽⁸⁾. eForms can be used on a voluntary basis as of 14 November 2022. On 25 October 2023, the current standard forms will be withdrawn and the use of eForms will become obligatory for procurement procedures above the EU thresholds.

eForms will allow the collection of procurement data in a more structured way. Structured data collection is key for achieving higher data quality and completeness, which are essential for reliable data analytics. For example, eForms contain dedicated fields to provide information on green, social and innovative procurement (including compliance with the Clean Vehicles Directive) in a structured way, which is not possible with the current notices.

The introduction of eForms will also allow to capture, over time, the complete procurement cycle. To that effect, eForms will be extended to include for the first time voluntary forms for contract completion notices (i.e. post-award information such as the final price paid, subcontractors used, actual completion time needed and complaints received).

Procurement data generated and published at Member State level

Public procurement procedures below the EU thresholds account for the remaining 80 % of procurement contracts. There is no obligation at EU level to publish information on these procedures on TED and no common standard. The way data from these procedures is captured and published by public buyers depends on national rules and on the administrative organisation of each Member State. This leads to a variety of publication portals, thresholds and standards, ⁽⁹⁾ which renders the data difficult to re-use for better spending, transparency and policy purposes.

3. Benefits of harnessing the full power of public procurement data

Creating an integrated space for public procurement data above and below the EU thresholds, combined with an analytics toolset using advanced technologies will benefit public buyers, policy-makers at EU and national level, companies, researchers and taxpayers alike.

⁽⁴⁾ Directive 2014/24/EU on public procurement, Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors, Directive 2014/23/EU on the award of concession contracts, Directive 2009/81/EC on the coordination of procedures for the award of certain works contracts, supply contracts and service contracts by contracting authorities or entities in the fields of defence and security.

⁽⁵⁾ EU law sets minimum harmonised rules for calls for tenders whose monetary value exceeds a certain amount and which are presumed to be of cross-border interest (https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation/thresholds_en).

⁽⁶⁾ More specifically, in the Supplement to the *Official Journal of the European Union*. The link of the website is <https://ted.europa.eu/>.

⁽⁷⁾ <https://simap.ted.europa.eu/web/simap/sending-electronic-notice>

⁽⁸⁾ Commission Implementing Regulation (EU) 2019/1780 establishing standard forms for the publication of notices in the field of public procurement and repealing Implementing Regulation (EU) 2015/1986, published on 25 October 2019. The Regulation and the extended version of its annex in the Excel file can be found here <https://ec.europa.eu/docsroom/documents/38172>. The Implementing Regulation has just been updated by Commission Implementing Regulation (EU) 2022/2303 of 24 November 2022, notably to allow structured reporting on innovative, green and social procurement.

⁽⁹⁾ Member States are free to determine their value thresholds for (national) publication. Many Member States have no or relatively low thresholds and thus collect a more complete set of data. Others have set relatively high thresholds and therefore usually capture much less data. Some Member States leave it to public buyers in what format they publish data on procurement procedures, others have defined (various) templates. Some of these templates include only a few variables while others use extensive data templates, in some cases even going beyond the standard EU forms. Moreover, a number of Member States have multiple sub-national portals in addition to their national portal. Two Member States have no central portal.

Public buyers in Member States at all levels will get better value for money from public procurement procedures since the PPDS will enable a more data-driven planning of calls for tenders, as well as benchmarking and knowledge-sharing, increased digitalisation, easier detection of fraud and collusion, and it will also help them to improve access to calls, including for SMEs.

— Get better value for money through data-driven planning of calls for tenders

Public buyers will gain valuable insights about their demand, including predicting future trends through AI and machine learning, and about the supply-side, i.e. the past performance of tenderers to assess which have offered value for money.

With that knowledge, public buyers can organise procurement procedures more efficiently. For example, they can team up and 'buy in bulk', either through central purchasing bodies or on an ad-hoc basis, to obtain better prices and higher quality goods and services. Today, this potential remains largely untapped, especially cross-border: only 11 % of EU procedures are carried out through cooperative procurement.

Today, many joint procurement procedures are coordinated at EU level in specific sectors of the economy. One concrete example is the EuroHPC (High Performance Computing) Joint Undertaking, a EUR 1 billion joint procurement and research and development cooperation. Within that framework, the French Grand Equipement National de Calcul Intensif (GENCI) and the German Jülich research centre are jointly procuring two quantum simulators (supercomputers). Another example is the EU joint procurement of Veklury® (remdesivir), an antiviral treatment for patients with COVID-19, coordinated by the Commission's Health Preparedness and Response Authority (HERA). 22 EU Member States and countries are participating and can order the treatment under the second Framework Contract signed on 19 July 2022. With more data-driven planning, public buyers could reap the benefits of joint procurement in less visible sectors and without EU coordination.

— Improve targeting and performance of public spending through benchmarking and knowledge-sharing

Since currently public procurement data is spread across many systems and in different formats, valuable knowledge of particularly successful or targeted call for tenders often stays in silos. Public buyers are therefore very keen on the possibility that the PPDS will offer to benchmark and compare themselves and learn from each other. These insights can either be shared on a needs-basis or, more widely, through trainings and guidance documents.

This applies especially to areas on which the upcoming eForms will capture information for the first time in a structured way, notably on green, social and innovative procurement. This will for example allow to identify for which procurement procedures and how public buyers use green criteria. The sharing of knowledge on strategic procurement across silos will help to better use public spending to implement the Green Deal and other priority policies.

Since the PPDS will lead to greater harmonisation and interoperability between systems, knowledge and resource-sharing can also extend to technical tools, such as analytical models.

— Benefit from further digital transformation

The PPDS will further boost the digital transformation of public buyers and public administrations in general, in line with the Commission's strategy for e-procurement⁽¹⁰⁾. Over time, more and more data will be automatically distributed from the multiple public buyers to more centralised levels. This means that the advanced analytics and AI techniques that come with the PPDS will enable public buyers to further automate the tendering phase. One example that has been implemented in several pilot projects⁽¹¹⁾ is the automated selection of Common Procurement Vocabulary (CPV) codes when classifying a call for tenders. This does not only save resources, but also improves participation since misclassification of CPV codes can result in fewer potential bidders identifying the calls as relevant to them.

⁽¹⁰⁾ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0179&from=EN>. One of the conditions for a successful establishment of the PPDS is that Member States put in place automatic data capture mechanisms, in a first step transmitting data from their national portals and contract registers (see page 12 below).

⁽¹¹⁾ European Commission & Deloitte (2020), Study on uptake of emerging technologies in public procurement. Available at: https://ec.europa.eu/growth/single-market/public-procurement/digital/emerging-technologies_en.

— Fight collusion, corruption and fraud and avoid waste of public money

Every year, a part of public spending is lost due to fraud, corruption and other illegal behaviour. This is the reason why EU legislation, notably the Recovery and Resilience Facility (RRF) Regulation, obliges Member States to take appropriate measures to prevent, detect and correct fraud, corruption, and conflicts of interests in relation to the funds provided under that Facility ⁽¹²⁾. Combined with AI and machine learning techniques, the wealth of data available within the PPDS will help public buyers to detect potential collusion like bid-rigging as well as corruption more easily. These emerging techniques can identify behaviour and spending patterns indicative of wrongdoing and flag them for further investigation.

A concrete example of the use of data and analytics to fight collusion and fraud has been deployed by a European-funded project ('TheyBuyForYou'). Slovenian public procurement data was processed via machine learning techniques (supervised, unsupervised and statistical) to identify potential fraud patterns. The project demonstrated the effectiveness and efficiency of leveraging data in this way. Exploiting such a large volume of data manually is virtually impossible.

Moreover, linking the PPDS data to other, already available data sources would help public authorities to better understand the ownership structure of participants in procurement procedures, including identifying their ultimate beneficial owners.

— Improve access to calls for tenders to foster competition

The main goal of public procurement is to foster competition to spend public money as efficiently as possible. This is all the more important today when public budgets are stretched after the COVID-19 pandemic and as military spending is increasing.

However, today in 60 % of the Member States, more than 20 % of all procedures receive only one bid, i.e. with no competition. The PPDS will help public buyers and policy makers to detect certain patterns and understand how access to calls for tenders can be improved, especially for SMEs.

— Easier reporting on innovative, green, and social procurement

The PPDS will also cut red tape for public buyers and Member States when complying with various reporting obligations, for examples on innovative, green and social procurement.

Today, public buyers can provide information about compliance with green, innovative and social procurement criteria only in an unstructured way ⁽¹³⁾. eForms introduce dedicated and easy-to-use fields for these criteria.

An example for mandatory green procurement is the revised Clean Vehicles Directive (CVD) ⁽¹⁴⁾. The Directive sets national targets for the public procurement of clean vehicles to boost demand and accelerate deployment of low- and zero-emission vehicles. The data collected through the dedicated fields in eForms and analysed within the PPDS will greatly facilitate the reporting by Member States foreseen by the Directive and allow accurate monitoring of these targets.

— Track the use/absorption of EU funds

eForms will also provide dedicated fields for the use of different EU funds and programmes. The PPDS will thus help Member States to monitor and report on the use and absorption of these funds, including funds from the RRF, which are used for example for investment projects such as hydrogen plants or buses with alternative propulsion through public procurement procedures ⁽¹⁵⁾. In addition, Member States will be able to monitor more easily relevant contractors, sub-contractors and ultimate beneficial owners.

⁽¹²⁾ Article 22(2)(b) of Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility.

⁽¹³⁾ The current (EU) standard forms do not provide fields for such reporting. As mentioned above, a few national formats go beyond the EU standard forms, also as regards green, innovative and social procurement.

⁽¹⁴⁾ https://transport.ec.europa.eu/transport-themes/clean-transport-urban-transport/clean-and-energy-efficient-vehicles/clean-vehicles-directive_en

⁽¹⁵⁾ The overall tracking of investment projects under the RRF is carried out under the Recovery and Resilience Scoreboard on the basis of the FENIX database.

The PPDS will give policy-makers at EU and national level a powerful tool to monitor, compare and analyse public spending across the EU.

Easier and more structured reporting for public buyers means more efficient monitoring for policy makers. Analysing unstructured text is not only very time-consuming but also prone to errors. Moreover, like the majority of public procurement data, the information is spread over multiple systems. With the introduction of eForms and a platform to access both data above and below the publication thresholds, policy makers can monitor and drive the implementation of key policies more efficiently. This will enable them to assess the efficiency of public policies in the area of public procurement and beyond, and where necessary adapt them based on complete and near real-time data.

The PPDS will also give policy makers insights to manage future crises more efficiently, thus boosting resilience. Global crises such as the COVID-19 pandemic have underlined the importance of digitalisation, including in public procurement. Public procurement is the main channel for purchasing medical equipment and medicines. eProcurement and the access to public procurement data have already accelerated the distribution of urgently needed medical supplies and resources such as personal protective equipment in the early months of the health crisis. More real-time and higher quality data could allow to track the origin of critical supplies and even to introduce a 'rating' system where public buyers could have indicated their quality by origin and/or supplier (beyond the existing quality markings, which turned out to be unreliable at times).

More recently, the war in Ukraine has disrupted supply chains, caused a sharp increase in energy prices, motivated a number of Member States to increase military spending and attracted millions of refugees needing shelter. In a similar context, the PPDS would allow to better understand the impact of these developments on the Single Market, especially when combined with other market data such as on raw materials. Monitoring the flow of goods and services procured by public buyers within the Single Market and between the Single Market and third countries, in near real time and at a very granular level, will give policy makers new insights to manage crises more efficiently and thus contribute to making the EU more resilient.

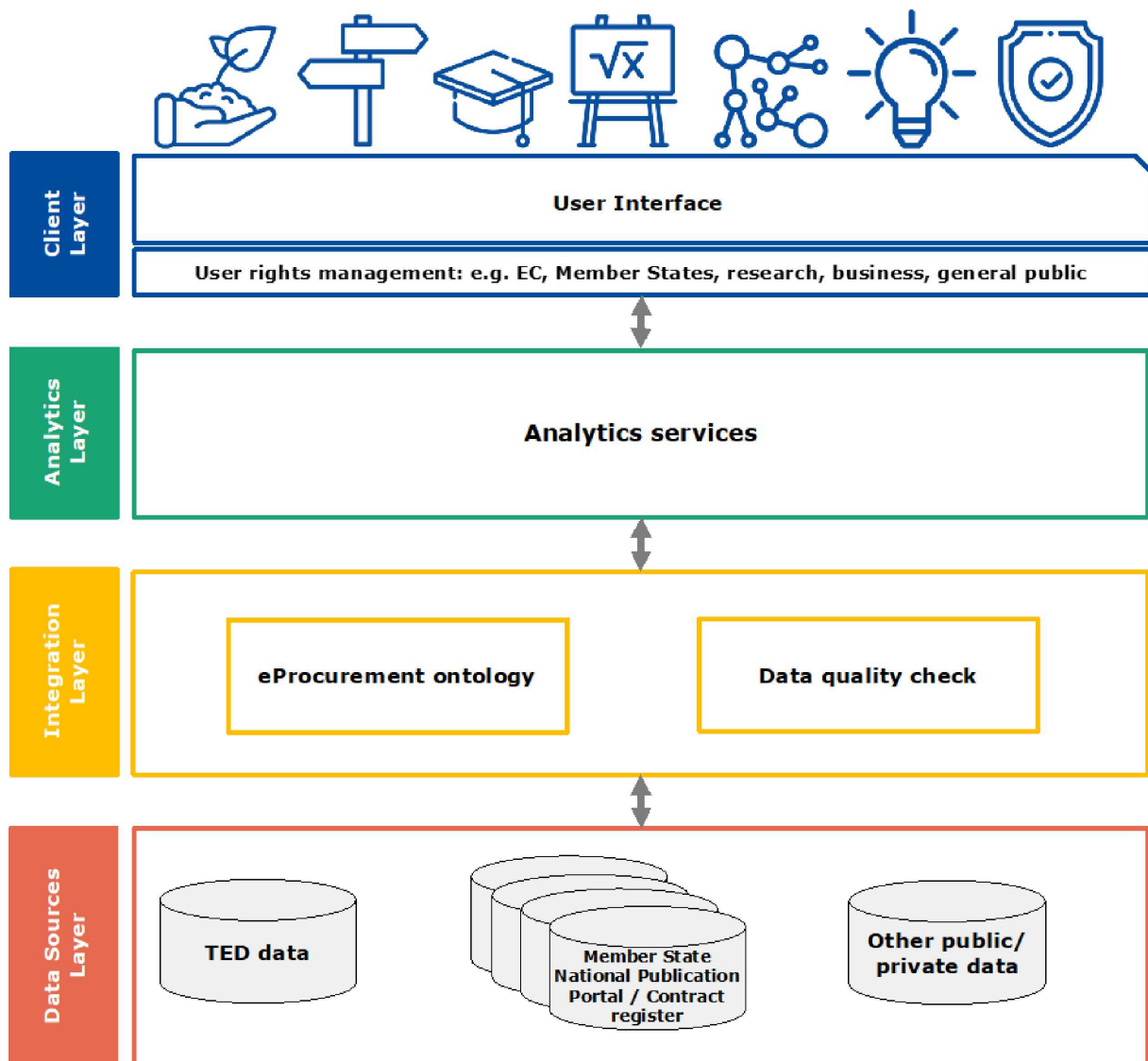
Companies, i.e. potential bidders, will have access to a much greater number of open calls for tenders with better data quality across Europe. A new user interface will allow companies to easily identify relevant calls on time. New analytics tools in combination with current and historical data will enable them to plan ahead, identify markets trends (e.g. more sustainable procurement) and place their bids more strategically (e.g. buyer profiles and long-term pipelines).

This simplified one-stop-shop access and the analytics tools are especially important to create a level playing field for SMEs. SMEs do not have resources to monitor multiple portals for relevant call for tenders. Moreover, given their scarce resources and targeted expertise, they must concentrate their bids on calls where their chances of winning are highest. The PPDS will enable them to do just that. For example, SMEs specialised in that area could single out buyers that focus on innovative and sustainable procurement and find out how they have organised calls for tenders in the past. SMEs will also benefit if public buyers use the new insights available to them to make calls more accessible for smaller companies.

Taxpayers, their associations, NGOs and citizens have been increasingly asking for more transparency on how public spending is managed: By giving them the appropriate level of access, the PPDS will lead to greater accountability of public buyers. Notably, researchers and data journalists will have access to a much wider pool of good quality data to pursue their respective projects and help generate new insights. Giving academia access to the PPDS will in turn unleash innovative ideas on analytics and over time enrich the analytics toolset of the PPDS.

4. The concept of a European public procurement dataspace

The development of a truly integrated space for public procurement data will require a collaborative effort at EU, national and at the level of all public buyers across the EU. The PPDS will consist of four layers.



Data source layer

The data source layer will consist of the data sources used by the PPDS to collect data. There are three main data sources:

- The TED portal, managed by the Publications Office of the European Union, which provides pre-award data mainly above the EU thresholds. Some Member States already voluntarily send notices for procurement procedures below the EU thresholds. This will become even easier with the voluntary forms foreseen to be introduced in eForms. eForms will also provide in the future a voluntary completion notice in order to better capture the full life-cycle of a public procurement, including the post-award phase.
- Member States' public procurement portals, which contain the latest information on tenders ⁽¹⁶⁾. In a first step, these will provide mainly pre-award data on procedures below the EU thresholds, to the extent that these are captured by Member States (see page 4 above). Member States will remain in control over which data they wish to share with the PPDS (beyond the data that must be published on TED under the Public Procurement Directives) ⁽¹⁷⁾.

⁽¹⁶⁾ These are usually the national publication portals or contract registers.

⁽¹⁷⁾ With the eForms, it will be possible for the first time to provide data in notices that should not be published, or not immediately. This is important to give assurance to public buyers that certain data is not made publicly available or not before a certain point in time (e.g. prices).

- Other public and private databases can be connected to the PPDS to allow even more far-reaching insights and cross-checks in combination with the public procurement data, such as public registers containing company data and data on the ultimate beneficial owners of bidding companies.

Integration layer

The integration layer, to be established by the Commission in cooperation with Member States, will create a harmonised pool of public procurement data from the sources listed above. It collects and ‘translates’ the incoming data before distributing it on to the next layers and to users:

- The data will be collected via dedicated machine-readable ⁽¹⁸⁾ interfaces and data pipelines.
- The data will then be checked against a set of data quality rules. This allows to flag issues of completeness and quality on a data quality dashboard and, depending on the intended use of the data, to eliminate bad quality or duplicate data that would jeopardise the analysis. However, the primary responsibility for data quality lies with the public buyers (see also page 12 below).
- Public procurement data comes in different formats. TED data is currently in standard forms and will in the future be in eForms. The OCDS format ⁽¹⁹⁾ is used in some Member States, others use various other formats. The integration layer will ‘translate’ all data into one common language, i.e. the eProcurement ontology ⁽²⁰⁾ that has been developed by the Publications Office in co-operation with Member States ⁽²¹⁾. This is necessary to link data from different sources and re-use for analytics purposes.

Analytics layer

The Commission will also build an analytics toolset including emerging technologies (AI, ML and NLP). Member States can establish their own analytics layers to combine PPDS data with additional national sources if this derives valuable insights of them ⁽²²⁾.

Client layer / User interface

A user interface set up by the Commission will enable end users to access the data in the integration layer and/or derived insights in the analytics layer. Different user categories (e.g. Member States, public buyers, businesses, citizens, NGOs, journalists and researchers) will have different access rights, distinguishing between public and non-public data and between participating Member States that share their data with the PPDS (PPDS members, see also next section) and those that need more time to prepare. The sensitivity of information concerned will be taken into account when defining access rights for the different user categories. This interface will be user-tested and designed in a user-centric way to ensure that especially SMEs and citizens can easily get the information and insights that they are looking for. At this stage, it is intended that access for the different user categories will be granted free of charge.

⁽¹⁸⁾ <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/glossary/term/machine-readable>

⁽¹⁹⁾ <https://www.open-contracting.org/data-standard/>

⁽²⁰⁾ The eProcurement Ontology provides the formal, semantic foundation for the creation and reuse of linked open data in the domain of public procurement in the EU. It is planned that it will cover end to end, i.e. from notification, through tendering to awarding, ordering, invoicing and payment. With this goal in mind the Publications Office of the European Union engaged a Working Group (WG) of experts with the mission of building consensus on the analysis results and deliverables developed by the OP's teams. Information on the eProcurement ontology can be found here <https://github.com/OP-TED/ePO>

⁽²¹⁾ The ontology defines a model which enables the linking of data, based on a common understanding of the different concepts. The ontology is designed in such a way that it is compatible with upcoming eForms. The OP will provide a conversion tool for the PPDS to convert the current notices and the future eForms to the ontology. This tool will be used for converting TED and data from the national publication portals to the ontology. This means that current and future EU level and national level data can easily be converted to the same format to avoid any loss of information in the future. This action is carried out under the Preparatory Action on Transparency in Public Procurement. Member States can leverage the ontology to improve their public procurement data landscape.

⁽²²⁾ The PPDS will be built on the FAIR principles (findability, accessibility, interoperability, and reusability of data) and in line with existing data protection regulations (GDPR).

Upon its availability, it is planned to integrate the smart middleware Simpl into the PPDS. Simpl offers horizontal components for cloud-to-edge federations and common data spaces implementation ⁽²³⁾.

5. Key enablers at member state level

A small number of initiatives ⁽²⁴⁾ have already been undertaken with a view to integrating procurement data above and below the EU thresholds. In addition, an eProcurement analytics pilot-project was carried out in 2020 and 2021 aiming at mapping different data sources (from TED and three Member States). All these endeavours encountered the same challenges: different data formats, data quality (including missing identifiers), lack of automation and limited scope of data.

The PPDS will be able to deal with different formats since they will be mapped into one common 'language', the eProcurement ontology (see previous section) ⁽²⁵⁾. The remaining challenges will need to be tackled at Member State level. This is paramount for Member States to participate and share their data more easily within the PPDS.

PPDS members will have access to data which is available within the PPDS. However, even those Member States that are not yet ready to participate in the PPDS stand to benefit from implementing the principles below, due to their value for operational efficiency and preparing for a more evidence-based policy. The Commission stands ready to work hand in glove with all Member States to put them into practice.

Improve data quality and automate data flows

Low data quality, e.g. missing, erroneous or poorly formatted data, was one of the key challenges that all previous initiatives faced when analysing public procurement data. Often corrections needed to be made before analysis was possible. Since the quality of the insights to be derived from PPDS will depend on the quality of the input data, improving data quality is paramount:

- To support participating Member States, the PPDS will check incoming data against a set of data quality rules and flag issues of completeness and quality on a data quality dashboard. However, the PPDS cannot correct data by itself; the main responsibility for improving data quality lies with the Member States/public buyers. It is therefore recommended that Member States put in place data quality checks at source level ⁽²⁶⁾.
- Through the mandatory use of eForms, data quality will improve due to the more structured intake form and an enhanced business rule set. Updates and corrections will also become much easier with eForms. In order to leverage the full potential of eForms for data quality, Member States should also make use of the voluntary eForms notices for procedures below the EU thresholds.

Today reading and capturing public procurement data from one point to another involves repeated manipulation of data, especially in an environment with multiple decentralised data sources. Automating data flows would not only further enhance data quality, but also pave the way for near real-time transmission and analytics – while saving significant resources along the way.

- The first step towards this objective is to ensure the machine-readability of public procurement data sources. This holds true for the connection of the national portals to the PPDS's integration layer through machine-readable interfaces (see previous section) but should also be applied by Member States across all public buyers.
- The use of unique and persistent identifiers is another essential step to further automate data flows. Unique identifiers refer to data elements and data sets such as buyers, suppliers, procedures and phases of procedures, lots, contracts, and objects of the procurement procedures (e.g. services or products) and thereby structure data efficiently. Where not already the case, Member States should therefore use identifiers throughout the public procurement ecosystem. The eProcurement ontology facilitates and encourages the use of persistent unique identifiers to support that process.

⁽²³⁾ Simpl: cloud-to-edge federations and data spaces made simple, <https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-made-simple>

⁽²⁴⁾ For example: DigiWhist (<https://digiwhist.eu/about-digiwhist/>), TheyBuyForYou (TBFY) (<https://theybuyforyou.eu/about/>) and eProcurement Analytics Pilot (https://ec.europa.eu/isa2/actions/simplifying-public-tenders_en).

⁽²⁵⁾ In comparison with previous data aggregation attempts, the ontology has the additional advantage of capturing the complete notice, especially with the upcoming eForms.

⁽²⁶⁾ The general and use-case specific data quality checks and business rules developed by the eProcurement ontology and eProcurement Analytics Pilot can guide these efforts.

- The more Member States automate their data flows, the more they will be able to leverage new technologies such as AI and NLP to save resources through increased operational efficiency, e.g. in classifying data elements such as CPV codes or maintaining nomenclatures. The same emerging technologies can create new and more comprehensive insights, complementing the PPDS analytics toolkit at national or regional level, e.g. price indexes to estimate costs more accurately.

Extend the scope of data capture towards the entire procurement cycle

Member States should work towards capturing data from the pre-award and the post-award phases. Some Member States already publish contract completion notices, which contain information about the final costs and the actual duration of the contract. The upcoming eForms will provide a voluntary completion notice to fill in. Member States who do not yet publish completion notices are strongly encouraged to use the future eForms completion notice as a first step towards extended data capture.

By combining information on the planning phase (what buyers plan to procure), the competition phase (what is the estimated price and the duration), the award notice (how much will it cost) and the completion notice (how much did it cost in the end and the duration of the contract), the PPDS and its analytic toolset will be able to provide to its users a much more comprehensive understanding of the complete public procurement lifecycle.

Implementing the principles above requires building new capacities and skills. Such capacity building should be targeted in a way that enables blending business and technical skills, which is critical for the success of any data-driven endeavour.

6. Progressive implementation in cooperation with Member States

The PPDS is financially supported by the Digital Europe Programme ⁽²⁷⁾. EUR 4 million were already granted for 2021/22. The needs for 2023 and 2024 are estimated to be around EUR 3 million. Once the system is up and running, the operating costs at EU level will revolve around EUR 500 000 per year. The Member States bear their own costs for digitalising their public procurement systems and connecting their data sources to the PPDS. However, financial and technical support is available through the RRF, the Technical Support Instrument and structural funds.

The PPDS will be implemented progressively, so that the needs of Member States and other users can be discussed in dedicated workshops and taken on board while the implementation is ongoing. This collaborative approach will help to provide a useful product for stakeholders both at national and at EU level. The main three phases listed below can thus be adapted along the way, for example certain external databases could be connected with the PPDS already during the first two phases if there is user demand.

Phase 1: Now until Q2 2023

In a first step, the Commission will set up the basic architecture of the PPDS and a minimum data analytics toolset. TED will be the first data source to be connected to the PPDS. It is foreseen that in the future the public procurement indicators for the Single Market Scoreboard ⁽²⁸⁾ and other basic indicators will be calculated on that basis.

At the same time, the data governance framework for the PPDS will be elaborated in cooperation with Member States to define the scope of responsibilities, the interaction with key stakeholders and the maintenance and further development of the PPDS. In parallel, preparatory work will take place to support Member States that want to join the PPDS.

Phase 2: Q3 2023 until Q4 2024

The second phase will last approximately two years and carry out three main parallel work tracks:

- The Commission will support interested Member States to connect their national publication portals to the PPDS through the integration layer. National portals using EU notices (either the current forms or eForms) will be easier to connect than those using other formats.

⁽²⁷⁾ More information can be found here: <https://digital-strategy.ec.europa.eu/en/activities/digital-programme>.

⁽²⁸⁾ https://single-market-scoreboard.ec.europa.eu/policy_areas/public-procurement_en

- The Commission will also further develop the data analytics toolset and integrate mechanisms such as AI and others to help identifying patterns and monitoring policies like the Green Deal, and innovative or social procurement. In addition, the Commission will implement the quality dashboard to give participating Member States feedback on data quality and data completeness and enable them to put in place or improve their own data quality management systems.
- The third track is to integrate historical data from TED and if possible, from national portals to be able to identify trends over the last decade and predict better future trends.

Phase 3: 2025 and beyond

In the future, it is planned to further extend the scope of the data available for analysis within the PPDS:

- Link the PPDS with existing data sources available at EU and Member States level (e.g. beneficial ownership registers, business registers, eInvoicing, etc.) to be able to generate additional insights such as the identity of beneficial owners behind suppliers.
- As Member States gradually extend data capture, add more data from the public procurement process itself to eventually cover the entire procurement cycle, from the pre-award to the post-award phase.

The connection of the PPDS to other upcoming data spaces (like eHealth ⁽²⁹⁾) and the Once-Only Technical System under the Single Digital Gateway Regulation ⁽³⁰⁾) will also be explored. The exact extension of the PPDS will be discussed and decided in cooperation with the participating Member States.

7. Conclusion

Transparency requirements and the implementation of digital solutions for various steps of the procurement cycle (eProcurement) generate a massive amount of data submitted by public buyers. However, this data currently remains under-exploited for reasons of data quality and interoperability.

As set out in the EU strategy for data, this initiative on public procurement data will unlock this potential. The PPDS will help to gain new insights that shared knowledge using state-of-the-art analytic techniques such as AI can generate from this wealth of data. These insights will improve the quality of public spending, improve access to calls for tenders especially for SMEs, preserve the integrity of public expenditure and seize the opportunity to make policies more data-driven.

⁽²⁹⁾ More information on the European Health Data Space can be found on https://health.ec.europa.eu/ehealth-digital-health-and-care/european-health-data-space_en

⁽³⁰⁾ Regulation (EU) 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services. Article 14(1) of that Regulation provides that evidence relevant for the procedures covered by the Public Procurement Directives must be made available by competent authorities through the Once-Only Technical System.

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