

The potential use of AI in public procurement processes in CEE

INTRODUCTION

The use of Artificial Intelligence (AI) is transforming several sectors, and public procurement is no exception. In the Central and Eastern Europe (CEE) region, the adoption of some AI tools in public procurement tenders promises to offer significant opportunities to enhance efficiency, transparency, and streamline decision-making processes.

The increased use of AI in public procurement in the CEE region reflects a strategic move to leverage existing and proven technology for better governance. Specific, well-defined tasks in tender processes, such as certain aspects of bid evaluation and validation, are well suited to automation, reducing administrative burdens, and minimising human error. Furthermore, AI-driven analytics can enhance the transparency and fairness of procurement procedures, helping to detect fraudulent activities and ensure compliance with regulatory standards. These advances not only improve operational efficiency but also foster trust and accountability in public procurement systems.

This trend aligns with the broader European Union (EU) initiatives to foster AI integration across member states and several different sectors, while at the same time ensuring the safe and ethical use of AI by addressing typical risks. The recently adopted AI Act contains a specific provision on the Commission's obligation to evaluate and promote the convergence of best practices in public procurement procedures "in relation to AI systems". At the minimum, this provision will cover the procurement of different AI systems by members states, but may also be implemented by the Commission and its AI Office in a way that also covers the use of AI systems in public procurement in general.

As AI technology continues to evolve, its role in public procurement is expected to expand, driving further advances and setting new standards for public sector efficiency and effectiveness. In conclusion, the intersection of AI and public procurement in the CEE region represents a promising frontier for digital transformation. The AI Act provides a crucial regulatory framework that guides this integration, ensuring that AI applications are deployed in a way that best practices are converging, while at the same time safeguarding important EU public interests. As the region continues to embrace AI-driven innovations, public procurement processes stand to benefit from enhanced transparency, efficiency, and accountability, ultimately contributing to improved public service delivery and economic growth.

The importance of data

Many governments are now using AI solutions to improve public-sector productivity in different sectors such as transport, healthcare and public services. In 2019 at the World Economic Forum, the world's first public procurement guidelines for AI were released, emphasising the vast potential of using AI in the public procurement sector.



AI solutions provide an opportunity to monitor and analyse extremely complex and large sets of procurement data in order to automate or solve complicated tasks more efficiently than humans. The common areas where AI can bring value to public procurement are:

- **Anomaly Detection:** AI can monitor large quantities of public tender data and detect any anomalies, e.g. unexpected changes in purchase prices and allegations of fraud by using machine learning algorithms.
- **Risk Analysis and Pattern Recognition:** AI can capture and analyse millions of different data sources and provide a clearer picture of the profiles of procuring entities and bidders, and their patterns, to be able to identify and predict whether this particular partner is reliable or not.
- **Automate Manual Tasks:** AI can automate many time-consuming tasks for businesses, such as repetitive similar procurements, performance reporting, etc.
- **Global Sourcing:** AI can identify shifting trends in global supply chains, gain predictive insights into future supply patterns, and design sourcing strategies for different product categories.
- **Contract Lifecycle Management:** AI can streamline contract generation, negotiation, and workflow automation in public procurement by, among others, standardising templates.

There is an increasing number of examples of AI being used in public procurement. In 2016, Ukraine launched a fully online public procurement platform called Prozorro. It has since been recognised as one of the most innovative public procurement systems globally, with 3,000 to 5,000 new tenders published in the system every day. In May 2024, Prozorro had more than 55,000 announced tenders and over 250,000 suppliers.

One of the main goals of Prozorro was to eliminate corruption in the public procurement sector. In 2018, the State Audit Service began the automatic verification of tenders in Prozorro based on 35 risk indicators, launching an automatic procurement risk management system that was the first of its kind. The more indicators that are flagged, the greater the likelihood that the auditors will verify the tender. Practice shows that fraudsters have easily adapted their practices to game the system regarding risk indicators.

In parallel, a team of experts created and started training a new AI system to monitor public procurements, called Dozorro. This is based on software that learns to identify tenders with a high risk of corruption and is vastly different from risk indicators. Dozorro consists of three automated analytical instruments:

- A general analytics module, which contains data on all procurements made through the Prozorro system since 2015. The information is presented in the form of convenient tables, analytical graphs and charts.
- A medical analytics module, which contains information on medical procurement and allows data on product prices, customers and competitors, etc, to be analysed.
- A price analysis module, which allows the prices for goods purchased on Prozorro to be found. It shows the median price for the selected item, the minimum and maximum prices, and determines the expected cost of the purchase.

The results of Dozorro's first beta test in 2018 showed that AI identified 26% more tenders with an unfair selection of the winner, 37% more tenders where bidders were unfairly disqualified, and a 298% increase in events of collusion between bidders, than humans. In 2018, the OGP recognised Dozorro as the best project for engaging citizens in reforms in Ukraine. In 2020, Dozorro's role in the development of public procurement was recognised at the USAID Digital Development Awards. And in 2021, Dozorro, together with Prozorro, was given as an example in the US Anti-Corruption Strategy.

Sourcing: AI may help prepare public contract award proceedings



AI-based tools are already being used in some purchasing departments to analyse market conditions and trends, to identify potential contractors and sources of supply, and to compare products and solutions available on the market. These tools facilitate efficient and flexible supply chain management. Artificial intelligence is not currently being used in the public procurement market to the same extent as in the private market, but, thanks to their rapid development and huge potential, AI-based tools will soon be able to help streamline numerous processes and bring many benefits to public procurement as well, including in the preparation of tender procedures.

Analyses of needs and requirements: contracting authorities often find it difficult to define their needs accurately and to prepare a description of the subject of a contract that corresponds with the best possible solutions. They also often experience difficulties in anticipating significant changes that may occur during the performance of the contract (e.g. changes in raw material prices and the emergence of other technologies), and which should be reflected in the terms of the contract. AI-based tools could help identify the contracting authority's actual needs and then match them with solutions available on the market. AI could also perform a risk analysis of different solutions and recommend a specific course of action.

Contract value estimation: contracting authorities may also find it difficult to accurately estimate the value of a contract. AI could support the contracting authority in analysing the historical data of previous offers or contracts of a similar nature to determine costs and prices. This would allow the contracting authority to establish the average value of similar contracts, which may help it to estimate the value of the planned contract. In addition, with access to relevant data sources, AI could support contracting authorities in analysing current market prices and predict potential risks associated with price and regulatory changes, which may affect the final value of the contract.

Automatic generation of documents: AI can help to systematise and categorise a specific type of data for preparing proceedings, which could help to streamline the process. AI tools could also support the creation of tender documents by analysing and comparing them with the applicable legal regulations. Moreover, AI tools could create standard documents such as specifications of contractual terms and conditions, offer forms, model contracts or summonses addressed to contractors. While it is true that the use of AI systems for the generation of documents can increase the accuracy of their preparation and lead to a faster tendering process, AI-based tools are currently insufficiently developed to allow the use of documents in procurement without human verification.

Public procurement law provides measures that may be used to make tasks in sourcing easier. For example, before initiating contract award proceedings, contracting authorities can conduct preliminary market consultations. A contracting authority may also allow the submission of a variant bid and, in some specific cases, is also allowed to use negotiated procedures to award contracts. Although these solutions are useful, they are only based on information and suggestions provided by a small number of entities: participants in initial market consultations and tenderers submitting variant bids or participating in negotiations. Using them would require considerable time and resources.

Against this background, AI's potential seems very promising. The ability to analyse large amounts of data in a very short time without the need to involve external entities and the ability to predict future trends and to systematise and categorise data and generate documents are just two of the many potential benefits of involving AI in the preparation of public procurement procedures.

The use of chatbots



The main purpose of using chatbots is to automate both simple and complex tasks to improve the efficiency of business operations. As public procurement procedures are overall still administratively burdensome in CEE, advanced chatbots have great potential in this area. Chatbots are gradually being introduced in national public sectors, such as the three "AI supported service"

in Hungary available as a regulated electronic public service for all providers of e-government services (text-to-speech service, speech-to-text service and the AI supported communication interactive assistant) or the voice-mediated virtual assistant “Bürokratt” in Estonia. However, these services have not been tested extensively in public procurement in CEE yet, although many countries, such as Romania and the Czech Republic, are in the adoption/development phase of these systems.

It is essential to mention the continuous growth in the number of national AI strategies, with aspects and goals in the public sector. While CEE is developing slowly, interest in chatbots and their applicability in the public sector is increasing in the USA. In San Francisco, PAIGE (Procurement Answers and Information Guided Experience), an AI-based chatbot application for San Francisco city procurement officials, is responsible for assisting government agencies with digital public procurement processes. PAIGE is widely used by the contracting authority to support the efficiency of IT procurements and frees up a significant amount of human resources. Chatbots can serve as a versatile interface in public procurement policies and procedural rules. We envisage the following key potentials:

- **Transparency and consistency:** chatbots can provide step-by-step guidance for contracting authorities when compiling tender documentation in the preparation phase, so the common problem of using inadequate or outdated templates can be eliminated, which will also save time. Similarly, a trained chatbot is able to help bidders complete and submit their bids, which are not only formally compliant, but which also comply with the applicable public procurement processes by giving the same guided and easy-to-follow walkthroughs.
- **Efficient query management:** permitted communication between purchasers and bidders has several competition law-related constraints, which are difficult to follow in practice if queries arise in the process. In Serbia, a chatbot specifically designed to provide virtual consulting support in the application of the Public Procurement Law (ZJN) is under development. An advanced chatbot has the potential to become the single point of contact for internal and external queries. According to recent studies, the technology should be able to answer 80% of queries. As a result, human experts will be able to focus on the more complex and significant queries. Several companies already successfully use this chatbot capability in their procurement portals in the private sector.
- **Improving contract management:** chatbots can provide an appropriate front-end for other AI systems that can find the relevant data necessary to track performances easily, e.g. when a contract will expire, how force majeure is worded, and what the prices in similar past tenders were. Based on such findings, AI-powered chatbots can highlight key information about such findings to people that would otherwise be missed and flag potential issues.

In our view, implementing advanced AI chatbots in CEE public procurement procedures could have several advantages, mostly beneficial to efficiency and transparency. Naturally, the use of this tool might face challenges, e.g. a lack of sufficient and classified data and a lower level of digitalisation in the public sector. However, the countless benefits AI chatbots could provide should exceed the potential implementation obstacles.

Although the effect AI chatbots can have on public procurement processes is significant, their use in the EU is no longer without boundaries. The EU’s Artificial Intelligence Act, in effect from 1 August 2024, introduces safeguards, limitations, bans and obligations regarding certain AI systems and practices to protect the fundamental rights and values of the EU. The act classifies AI systems and practices within its scope as “high risk” and “prohibited” based on their potential risk and level of impact. These categories cover, among many others, topics such as critical infrastructure and employment and work management related issues, making the act a key standard in public procurement.

Pricing

Price is considered one of the most important factors in the procurement process by both bidders and contracting authorities. It always plays an important role, even if various quality and timing aspects are considered at the same time. Therefore, pricing itself can be one of the most complex issues in the entire procurement process. The ability to level the playing



field and reduce costs on both the contracting authority's side and the bidders' side is one of the biggest perceived benefits of AI in government procurement processes.

Contracting authorities can benefit from AI during the preparation phase to assess and evaluate the most suitable award criteria. AI can compare the various models available with data from previous procurements, and test the eventual outcomes and scenarios of the pricing models in the simulated conditions based on real market predictions, which leads to an outline of the optimal award criteria. To identify the best suppliers, authorities can generate supplier rankings based on predefined criteria they choose such as price, quality, reliability, and delivery performance.

Authorities may also be able to reduce procurement costs by employing AI to identify patterns linked to fraud. Artificial intelligence can be used to identify flaws in bids and detect anomalies such as unusual bidding prices or price manipulation.

AI can be used by bidders during e-auctions, where it enables a bidder not only to easily compare prices between multiple suppliers and other bidders in a matter of seconds, but it is also able to provide valuable recommendations and predict other participants' behavioural patterns in the auction. AI is also used to participate in e-auctions and automatically make price adjustments based on predefined algorithms while maintaining the best profit for the bidder.

To optimise pricing tactics, AI is capable of analysing large volumes of supplier data, historical price trends, and market data. AI systems take into account variables including competitor supplier bids, market demand, and cost structures to produce the best pricing suggestions possible in order to maximise cost reductions without sacrificing quality for the best possible outcome.

Contract management

Contract management is a critical aspect of the public procurement process in the Central and Eastern European (CEE) region. Efficiently managing contracts ensures that parties fulfil their obligations, mitigate risks, and maximise the value derived from the procurement. The integration of Artificial Intelligence (AI) technologies in contract management can revolutionise the way contracts are monitored, analysed, and enforced. This chapter explores the potential application of AI in contract management in the context of public procurement processes in CEE.



1. **Automated Contract Analysis:** AI-powered tools can streamline the contract analysis process by automatically extracting key terms, clauses, and obligations from procurement contracts. Natural Language Processing (NLP) algorithms can parse through vast volumes of textual data to identify critical information such as delivery schedules, payment terms, and performance metrics. By automating this process, procurement officials can expedite contract review and ensure compliance with regulatory requirements.
2. **Risk Identification and Mitigation:** AI algorithms can assist in identifying potential risks associated with procurement contracts. By analysing historical data and identifying patterns, AI systems can flag potential discrepancies, ambiguities and inconsistencies in contracts that may pose a risk to the procurement process. Moreover, AI-powered risk assessment tools can provide real-time insights into emerging risks, enabling procurement officials to proactively mitigate them and safeguard the integrity of the procurement process.
3. **Performance Monitoring and Compliance:** AI technologies can enhance contract performance monitoring by tracking key performance indicators (KPIs) and milestones in real time. Through data integration and analytics, AI systems can compare actual performance against contractual obligations and benchmarks, providing stakeholders with actionable insights into performance deviations or breaches. Additionally, AI-powered compliance management tools can ensure adherence to regulatory requirements, contractual terms, and ethical standards throughout the procurement lifecycle.
4. **Predictive Analytics for Decision Making:** AI-driven predictive analytics can support decision-making in contract management by forecasting future performance, identifying trends, and anticipating potential challenges. By leveraging historical data and machine learning algorithms, procurement officials can

gain valuable insights into supplier performance, market dynamics, and emerging trends, enabling informed decision-making and strategic planning. Predictive analytics can also facilitate demand forecasting, resource allocation, and risk mitigation strategies, optimising the procurement process for greater efficiency and effectiveness.

5. **Contract Optimisation and Negotiation:** AI technologies can facilitate contract optimisation and negotiation by analysing historical contract data, market trends, and negotiation patterns. AI-powered negotiation platforms can simulate various scenarios, identify optimal negotiation strategies, and recommend contract terms that align with organisational objectives. Moreover, AI-driven contract management systems can enable dynamic contract adjustments based on changing business needs, market conditions, and regulatory requirements, ensuring flexibility and adaptability in contract management.

The integration of AI in contract management holds immense potential to transform public procurement processes in the CEE region. By automating contract analysis, identifying risks, monitoring performance, facilitating decision-making, and optimising contract negotiation, AI technologies can enhance efficiency, transparency, and accountability in public procurement. However, successful implementation requires careful consideration of data privacy, ethical considerations, and regulatory compliance to realise the full benefits of AI in contract management. As organisations embrace digital transformation, AI will continue to play a pivotal role in shaping the future of contract management in public procurement processes across the CEE region.

Take billing in Public Procurement to a new level with AI



In 2024, it is likely that you are already using an e-billing system and are well-acquainted with its advantages over traditional paper invoicing. However, you might wonder how AI can further revolutionise billing in public procurement, and how both companies and contracting authorities can reap the benefits.

Today, while most invoices are electronic, businesses still need to review each invoice individually to extract and process the information it contains. This manual review process is prone to human error. Traditional technology allows customers to “teach” machines to recognise invoices from specific senders by creating templates. These templates guide the computer to locate information in a PDF invoice. Once a template is established, it can be reused, but traditional OCR (optical character recognition) can still result in mistakes.

Combining OCR with AI eliminates the need for templates. Advances in AI and machine learning enable the technology to independently recognise essential data on invoices, verify its accuracy, and collect it. Post-extraction, AI can further process this information, integrating it into relevant accounts or matters. This results in quick and transparent budgeting and forecasting for projects, as well as accurate tracking of expected payments and expenses.

In recent years, AI billing systems have started to incorporate natural language processing (NLP) to better understand and categorise invoice content, even if the formatting varies widely between vendors. This allows for a more seamless integration of diverse invoice styles into standardised accounting systems. Additionally, AI-driven anomaly detection can flag unusual patterns or discrepancies in billing, helping to identify potential fraud or errors before payments are processed.

Introducing AI to e-billing offers significant time- and cost-savings for both contracting authorities and companies. Accelerated invoice review leads to faster payments. Companies can use AI to monitor invoices from subcontractors, suppliers, and others. Contracting authorities can leverage AI to streamline the transfer of data from invoices to ERP systems, eliminating cumbersome manual input.

Furthermore, AI can be trained to anticipate future invoices based on public procurement contracts, automatically check these invoices against expectations, and report any discrepancies. This predictive capability adds a layer of accuracy and efficiency, ensuring compliance and reducing the risk of errors. Recent developments in predictive analytics enable AI to forecast cash flow needs and budgetary allocations with greater precision, allowing organisations to manage their finances more effectively.

AI's integration into e-billing systems is also expected to enhance real-time financial reporting and analytics, providing stakeholders with immediate insights into expenditure patterns and budget adherence. This level of transparency and real-time analysis can significantly improve decision-making processes.

AI's integration into e-billing systems is poised to transform public procurement, driving efficiency, accuracy, and strategic financial management.