

## **The Impact of Digital Technologies on Ensuring Transparency and Minimising Corruption Risks among Public Authorities**

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### **Abstract**

Digital technologies are becoming increasingly important for promoting public authorities' transparency, accountability, and anti-corruption activities. The aim of the research is to analyse the impact of digitalisation on ensuring transparency and minimising corruption risks among public authorities. The study employed correlation analysis and graphical methods for modelling. The results of the analysis established that digital technologies have a significant potential to transform traditional practices towards greater accountability and transparency. Factors determining the effectiveness of digital technologies for increasing transparency are: the level of institutional readiness of authorities, overcoming digital inequality, legal regulation, and the development of information competence. Digital technologies have not yet realised their full potential to ensure systemic transparency of authorities and prevent corruption. A comprehensive approach is important to optimise these processes. Although digital technologies can provide significant transparency, their proper implementation, which lies between technical and social capabilities, has greater potential to enhance transparency, restore public trust, and combat corruption.

**Keywords:** digital technologies, transparency, public authorities, corruption.

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**Introduction**

Transparency in public administration is the basis for building trust, accountability, and effective governance. With the development of society, the need for open and accessible information from public authorities becomes increasingly urgent. Transparency is a fundamental principle of democratic governance that ensures citizens' right to information and accountability of public authorities for their actions and guarantees openness and fairness in decision-making processes. The importance of transparency goes beyond the disclosure of information, contributing to building public trust, countering corruption, and increasing the overall effectiveness of public administration (OECD, 2021; Tejedó-Romero & Araujo, 2020).

The active implementation of digital technologies is accompanied by radical changes that affect the provision of transparency in public administration. Open data initiatives, using the capabilities of the Internet, provide significant access to information from public authorities. For example, blockchain technology offers a decentralised and secure framework for transparent and tamper-proof record keeping. Artificial intelligence (AI) algorithms enable efficient analysis of huge data sets, revealing patterns and facilitating informed decision-making (Ramos & Ellul, 2024).

In this sense, digital technologies have significant potential for increasing transparency and countering corruption risks in public authorities. The effectiveness of technologies will be influenced by the features and mechanisms of their implementation, but this is not a simple use. Understanding the integration, regulation and optimisation processes of existing tools is key to realising a transformative impact on transparency and the ability to control government actions (Hochstetter et al., 2023).

Studying existing practices and potential challenges, modern research is aimed at developing practical recommendations for public authorities. State institutions seek to navigate in the digital space, modernise the management system, and ensure public anti-corruption control through the effective use of digital technologies.

The aim of the study is to analyse and evaluate the impact of digital technologies on increasing transparency and minimising corruption risks among public authorities.

**Research objectives**

The aim involves the fulfillment of the following research objectives:

1. Determine the existing level of transparency in public authorities.

2. Establish the degree of use of digital technologies by public authorities to promote transparency and minimise corruption risks.

3. Assess the effectiveness of the approaches used in implementing digital technologies to ensure transparency.

4. Study the relationship between digitisation, transparency, and the reduction of corruption.

Upon fulfillment of the objectives, the study offers a comprehensive understanding of the dynamics of the relationship between digital technologies, transparency, and corruption reduction, thereby contributing to ongoing efforts to modernise public administration and build public trust.

### **Methods**

The design of this study involves finding out the impact of digital technologies on transparency and minimising corruption risks in public authorities. The combination of methods aims to comprehensively understand the complex relationship between digital technologies, transparency, and anti-corruption measures in public administration.

The general approach provided for the definition of:

1) components of the general level of transparency in the public administration system (open data policy, open data impact, open data portal, open data quality);

2) dynamics of open data in 2022-2023 and analysis of their changes;

3) the dependence of transparency on the level of development of information and communication technologies;

4) the dependence of transparency on the level of corruption perceptions;

5) dependence of the level of corruption perceptions on the development of information and communication technologies.

The research used data on 27 European countries, determining the openness of data/transparency, information and communication technologies, and corruption perceptions (European Union, 2022; 2023; International Telecommunication Union, 2023; Transparency International, 2024). As an indicator of transparency, the Open Data Maturity (ODM) Report was used, which determines the progress of European countries in facilitating the accessibility of information from public authorities (European Union, 2023). The ICT Development Index assesses the universality and significance of modern communication systems worldwide (International Telecommunication Union, 2023). The corruption factor was determined based on the Corruption Perceptions Index (CPI) (Transparency International, 2024).

Diversity and representativeness were ensured through a sampling strategy that considered the differences in administrative functions and policy areas of different European countries to capture diverse experiences, conduct a comparative analysis, and model the relationships between these variables. Correlation analysis was used for statistical modelling to quantitatively assess the interdependence between the level of development of information and communication technologies and indicators of transparency and corruption perceptions in the studied countries, which gave grounds for empirical confirmation of existing dependencies.

So, the selected research design, the choice of countries, and the consideration of specific digital technologies in aggregate form a reliable methodology, which ensured the validity of the obtained results and provided recommendations.

### **Literature Review**

Transparency in public administration is the subject of fundamental research, which reflects its essential role in the processes of democratic change. The study emphasises the importance of transparency as a critical element in building trust among citizens, ensuring accountability and the rule of law, and promoting effective governance (Jashari & Pepaj, 2018). The studies reveal a multifaceted nature of transparency, emphasising its relationship with citizen engagement, decision-making, and the development of democratic institutions (Schnell, 2018).

The development of digital technologies is accompanied by a significant change in the paradigm of management activity, which opened new ways to promote transparency in public authorities, which is reflected in various studies of the transformative potential of modern technologies (open data, blockchain, artificial intelligence, etc.). It is argued that these technologies can help revise traditional transparency and anti-corruption mechanisms, offering access to information in real time, ensuring data integrity, and facilitating advanced analytics for decision-making (De Blasio & Selva, 2016). Indeed, political, legal, and technological openness discourses share common goals and can reinforce each other (Berliner et al., 2018).

Researchers (Nauli et al., 2023) study the impact of technological implementations (digital verification tools, data analytics), anti-money laundering initiatives, and internal regulatory reforms implemented by the state, financial institutions, and stakeholder organisations (Fayvishenko et al., 2023). Research results show that open data practices increase transparency by providing citizens with access to government information, promoting public engagement, and

increasing the accountability of public authorities. Public authorities consider transparency an important method of public accountability to society and a critical element of good governance (Navarro-Galera et al., 2017).

It was determined that the available benefits depend both on the type of transparency considered (Porumbescu et al., 2017) and on individual characteristics, such as the previous level of trust, attitude towards the authorities, and the level of knowledge about the actions of the state (Piotrowski et al., 2019). Transparency is seen as the availability of public information (Porumbescu et al., 2022), and transparency typologies are correlated with transparency objects (Cucciniello et al., 2017). In the narrow sense, transparency is a right of citizens in a democratic society, which can be guaranteed through legislation such as the Freedom of Information Act (Schnell, 2018). Transparency is a communicative act, and understanding the level of transparency requires consideration of the broader context, including the properties of the message, providers and receivers of information, and the relationships between them (Albu & Flyverbom, 2019; Schnell, 2022).

Citizens' vision of a certain content of the state is crucial if the basis is the legitimisation of state decisions, legality, and increase of public trust (Porumbescu et al., 2022). Such efforts are especially critical in the current period when there is a decline in trust in public institutions (Schnell, 2022). Public authorities must ensure that diverse audiences understand the essence of government activity and the reason for it (Schnell et al., 2023).

Anti-corruption mechanisms provide for the publicity, openness, and transparency of the functioning of public authorities, public control over the activities of authorities, freedom of speech and independence of the mass media (Tavolzhanskyi et al., 2023). Implementing the principles of transparency in the work of public authorities also involves combating corruption, promoting the publication of processes and results of public procurement, tenders, the use of budget funds, and control over the provision of public services. The general transparency of tender procedures significantly reduces the risks of corruption, and the specified results are mostly produced by transparency and accountability, which allow the monitoring of the specified activity by interested parties (Bauhr et al., 2020).

The researchers focused on assessing the prospects and challenges of using technologies to increase transparency. Features of open data portals of government agencies that publish publicly available data to promote transparency are considered. Harrison et al. (2012) analyse open data systems and conclude that public access to administrative data enhances accountability when combined with citizen activism. However, the willingness of public authorities to publish quality

data and be accountable is essential. Other researchers (Zuiderwijk et al., 2012) identify socio-technical barriers to using open data by various stakeholders, emphasising the need for empowerment and trust building.

Distributed ledger technologies such as blockchain allow transactions to be tracked, prompting evaluation of their potential to increase accountability in public financial systems. Ølnes and Jansen (2018) believe that blockchain architecture can increase transparency in public procurement and spending, although public authorities face scaling and implementation challenges. Sousa (2023) emphasises the importance of applying blockchain technology to public services, increasing information reliability and security. Still, standardisation and legal barriers currently prevent large-scale implementation in the public sector.

Methods based on artificial intelligence (automated detection of anomalies in administrative data, predictive analytics to identify fraud risks) are also promising for improving transparency and identifying corruption risks. Panda (2022) proposes a machine learning framework for auditing government spending data and detecting irregularities, although this approach has limitations in accuracy and acceptability among auditors. There is an ongoing debate around opaque algorithms that reinforce existing biases.

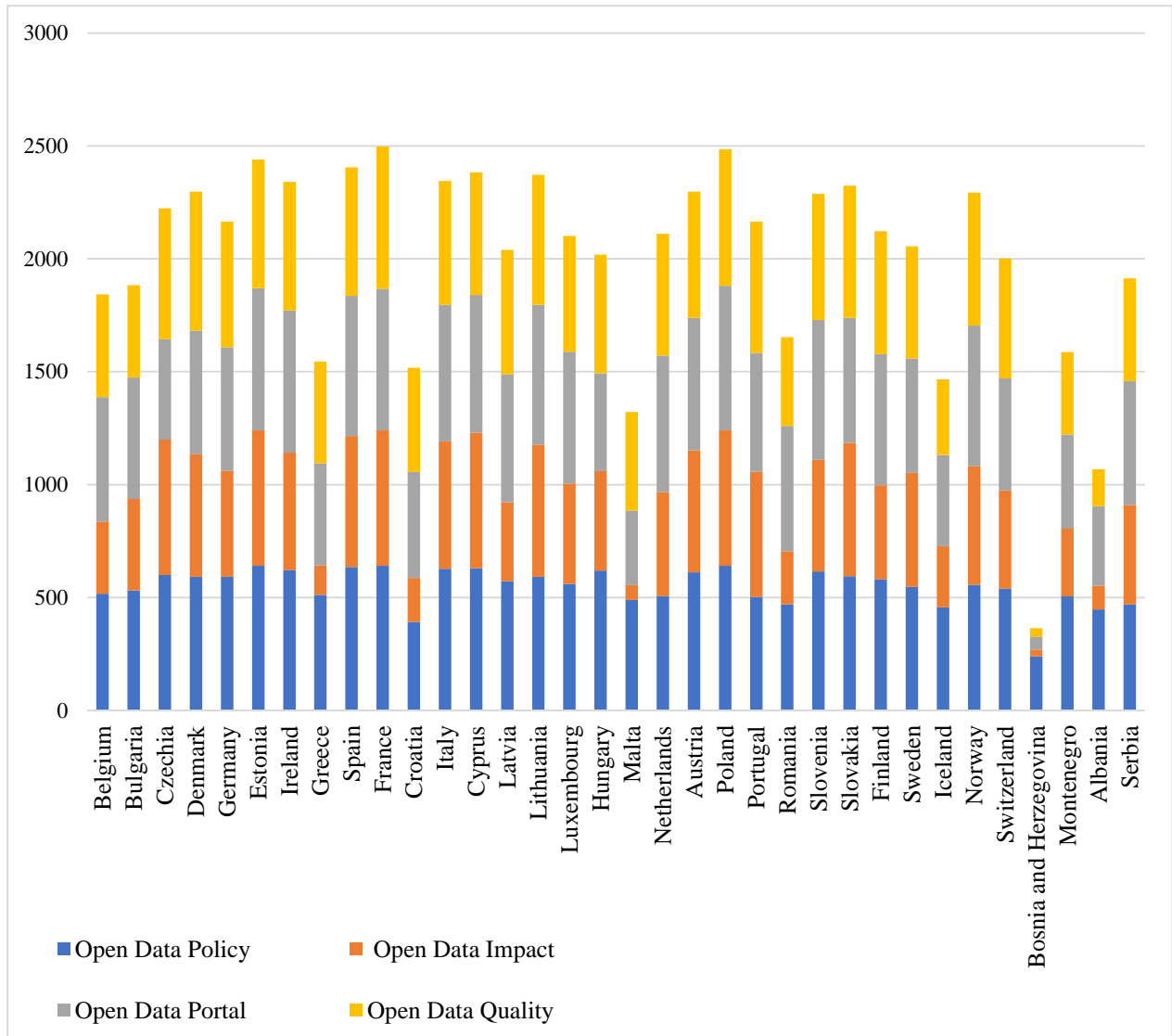
So, the literature review provides information on the relationship between digital technologies and transparency and minimisation of corruption risks in public administration. While existing studies provide a sufficient body of research, there is a need for more research into the complexities and challenges of implementing digital technologies for transparency and anti-corruption efforts. Understanding the long-term implications and adaptability of digital technologies in public administration will contribute to a deeper understanding and formation of effective strategies for public authorities.

## **Results**

Digital tools have become a driver of increased openness, accountability, and anti-corruption measures, modernising classical approaches. The transparency mechanism expands citizens' access to information, encouraging more careful monitoring of the actions of the state and public officials, as well as analysing, interpreting, and holding the authorities accountable. Open data platforms are vital in promoting transparency by making public authorities' information about finances, public services, and decision-making processes available. Online service delivery and communication platforms reduce bureaucratic opacity and increase accessibility, allowing citizens to interact more effectively with public authorities.

The analysis of the components of the general level of transparency/open data in the public administration system shows a different level in 34 European

countries and a different level of components (development of open data promotion policies; data available on portals; data quality; monitoring the use and impact of open data) included into the specified indicator (European Union, 2023) (Figure 1).

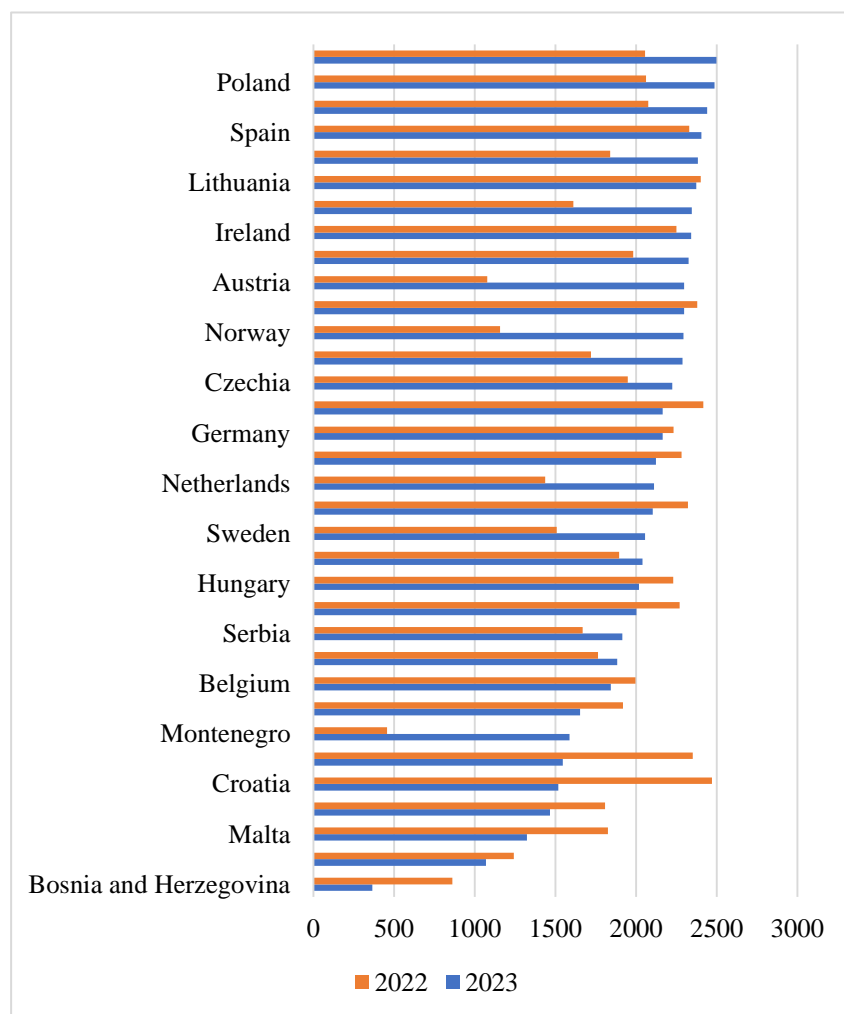


**Figure 1.** Components of the general level of transparency/open data in the public administration system (European Union, 2023)

Transparency/open data processes show uneven changes that occurred during the year from 2022 to 2023 in individual European countries (Figure 2).

Some countries have made significant progress (Austria, Norway, the Netherlands, Montenegro), while others have reduced their indicators (Greece, Croatia, Malta).

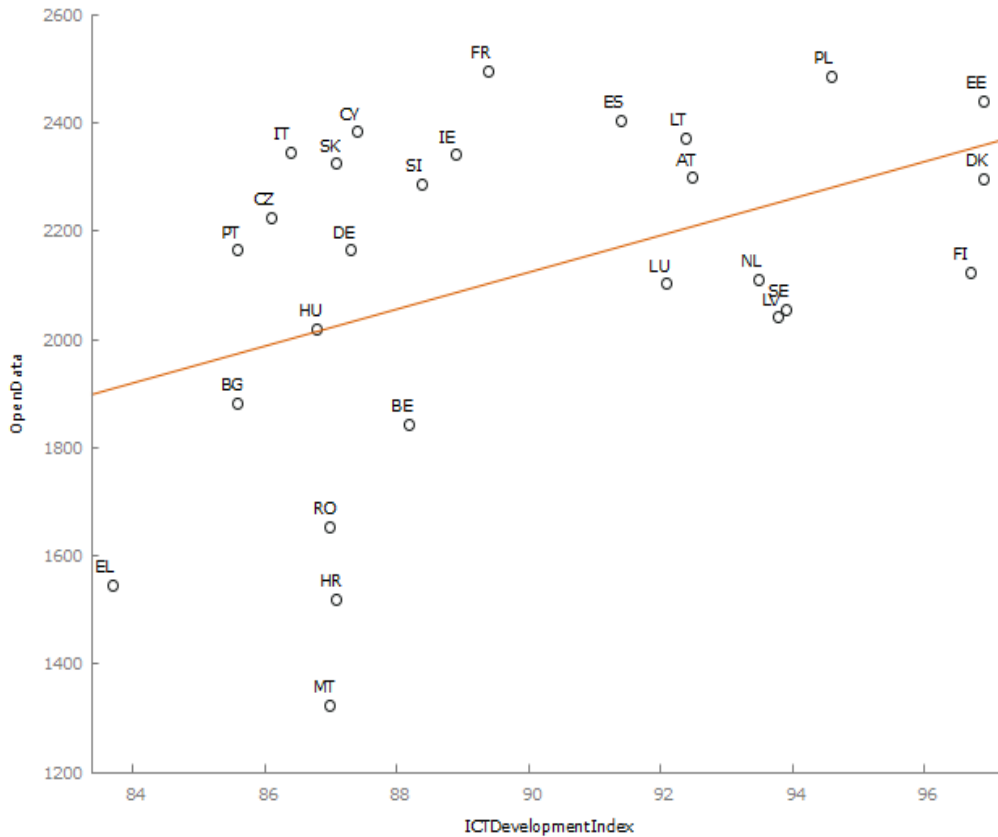
The dependence of transparency/open data on developing information and communication technologies in 27 European countries showed a dependence of around 20% (Figure 3). The scatter diagram shows a positive trend in the growth of technological development in European countries. It can be noted that in most cases, the Scandinavian countries and some countries of Western Europe became the leaders, while most of the Eastern European countries are still lagging in this indicator.



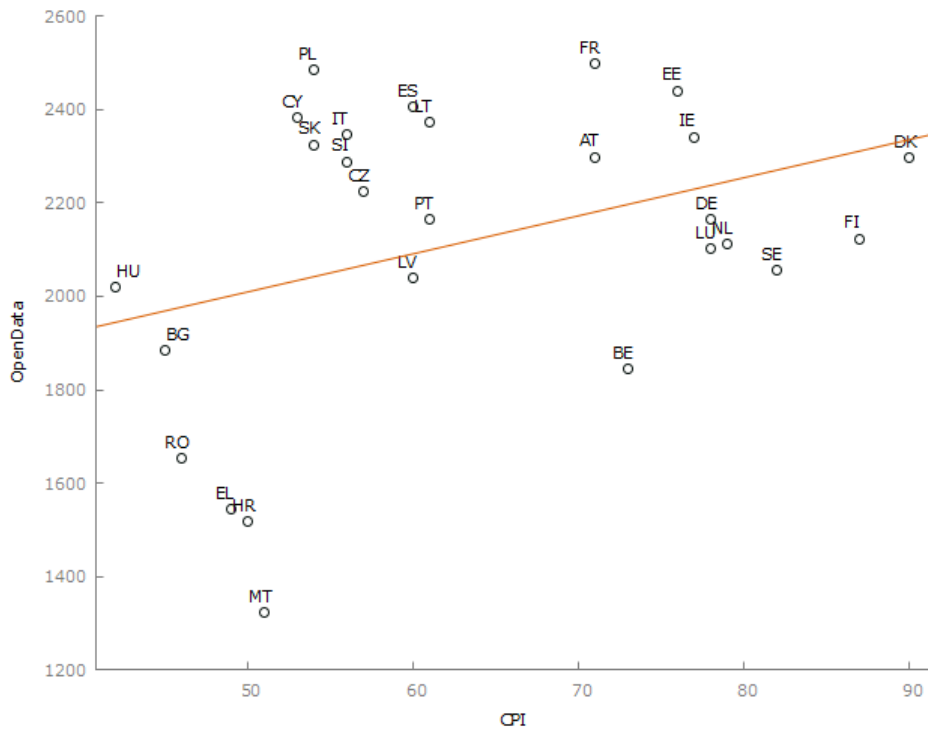
**Figure 2.** Dynamics of the level of transparency/open data (European Union, 2022; 2023)



The dependence of transparency on the level of corruption perceptions in 27 European countries showed a dependence of 13% (Figure 4). In general, it can be seen that positive dynamics are observed in most countries — the CPI index is increasing, which means that the rejection of corrupt actions in these countries is rising. So, the chart shows a low correlation between the level of corruption and transparency in Europe and significant differences between countries.

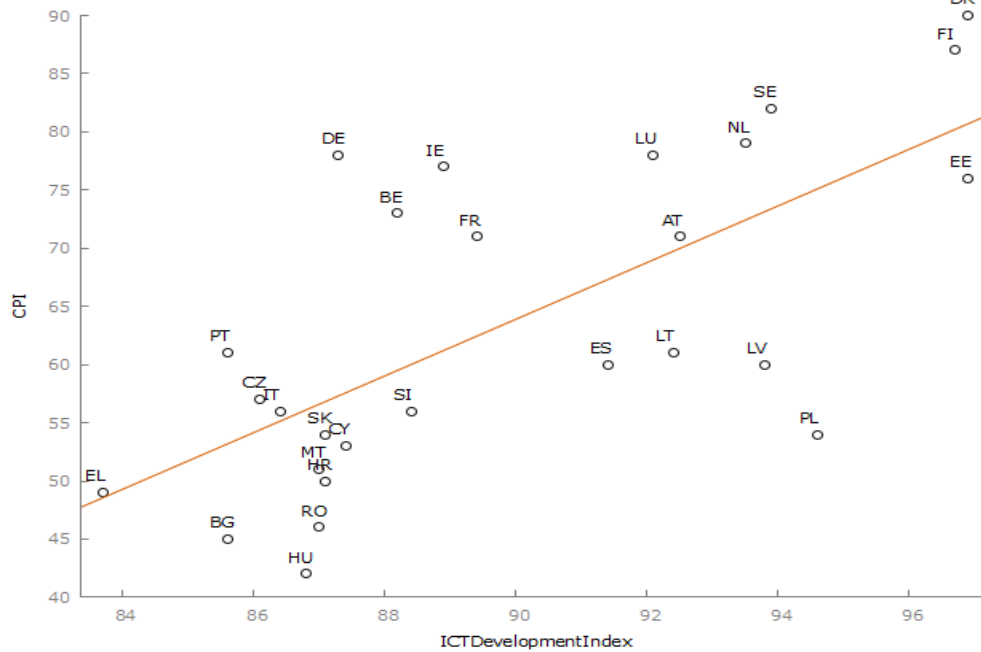


**Figure 3.** Dependence of transparency on the level of development of information and communication technologies (European Union, 2023; International Telecommunication Union, 2023)



**Figure 4.** Dependence of transparency on the level of corruption perceptions (European Union, 2023; Transparency International, 2024)

The dependence of the level of corruption perceptions on the level of development of information and communication technologies in 27 European countries demonstrated the dependence of 47% (Figure 5), which indicates a sufficiently high role played by open data portals, the provision of electronic public services in reducing corruption risks.



**Figure 5.** Dependence of the level of corruption perceptions on the level of development of information and communication technologies (Transparency International, 2024; International Telecommunication Union, 2023)

When public authorities begin to implement digital technologies to increase transparency and minimise corruption risks, they face many challenges (Table 1). Orientation in the digital sphere creates additional difficulties for public authorities that seek to maintain a transparent, anti-corruption approach while taking advantage of modern technologies.

**Table 1**

Challenges associated with maintaining transparency in the digital environment

Problems	The essence of the contradiction
<b>Information overload</b>	The large amount of digital data can lead to information overload, which makes it difficult for public authorities to provide the public with relevant and understandable information. Striking a balance between transparency and providing clear information becomes important for effective communication.
<b>Accelerated technological evolution</b>	The rapid pace of technological development presents public authorities with the task of introducing new technologies, which requires investment in training and infrastructure. Failure to adapt can lead to legacy systems that threaten transparency.

<b>Digital inequality</b>	The digital divide can deepen inequality, as not all citizens may have equal access to digital platforms, potentially depriving certain demographic groups of the benefits of transparent governance.
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One of the most important issues is ensuring the security of digital data. Public authorities handle vast amounts of sensitive information, and the risk of data leakage and cyber-attacks is a widespread problem. Protecting against unauthorised access and preserving the integrity of information is becoming critical to building public trust in the digital age. Privacy issues arise as public authorities collect and share data through digital platforms. Achieving a balance between transparency and privacy protection becomes a challenge that requires a solid legal framework.

Resistance to the adoption of new technologies is a common obstacle faced by public authorities. Civil servants may be reluctant to use digital tools because of lack of training, concerns about job security, or entrenched bureaucratic practices, requiring comprehensive change management strategies and education initiatives.

Therefore, integrating digital technologies in public administration to ensure transparency generates several challenges (data security, privacy, resistance to the implementation of technologies), which requires a comprehensive approach.

Evaluating the implemented digital systems from the perspective of increasing accessibility, comprehensibility, accountability, and trust in the authorities yields ambiguous results. Open data portals and blockchain tools increase the availability of administrative data, but disparities in public awareness and technical capabilities prevent equal participation. Similarly, although data publication standards are being strengthened, citizens' limited information literacy creates barriers to their implementation.

So, digital systems have an obvious potential to purposefully increase transparency and minimise corruption risks, but the actualisation of systemic achievements to transform slow bureaucratic hierarchies requires the harmonisation of social and technical factors. Comprehensive approaches that consider citizen empowerment, institutional readiness, and principles of equity are essential for technology to promote accountability and trust in public administration.

## **Discussion**

Analysing the research results on integrating digital technologies to increase transparency and minimise corruption risks in public authorities, it is

possible to single out several key factors that affect the extent to which technologies fulfil the specified tasks. There is an opinion in the scientific community that the connection between transparency and results in the public administration system has not been indisputably confirmed (Bauhr et al., 2020).

Globally, quantifying the causal impact of the use of digital technologies on the transparency of public authorities is hampered by identification problems and the limited availability of data on the large number of different digital transparency tools that may be used by the government (Schnell, 2020).

Information technologies create enormous opportunities not only for the development of the economy but also for the fight against corruption: from e-government and courts, digital public services and tools that report the facts of corruption, to the means of influencing society through social networks (Halai et al., 2021).

At the same time, increasing transparency means, in addition to providing information, citizens' understanding of the content and reasons for providing information by the state. Research results show that it is necessary not only to provide information but also to demonstrate positive results to build trust (Alessandro et al., 2021).

In the fight against corruption, countries implement legislation on transparency (open access to public information), which provides citizens with access to general information. The study confirms the existing results, namely that legal approaches to transparency, relying on the capabilities of information and communication technologies, play an essential role in providing citizens with information to ensure proper control over authorities and civil servants (Hochstetter et al., 2023).

Some technology-driven open government initiatives lead to greater openness but also lead to negative outcomes as previously closed and opaque public institutions are opened up. Political processes are not keeping up with the informational challenges of the digital age (Richards & Smith, 2015; Ingrams, 2020).

The study confirmed the existing results on preventing corruption based on the increase in the number of electronic pages that allow users to exercise public control over the processes in the public administration system (Gastón & Mariano, 2020). The study (Ouedraogo & Sy, 2020) also concludes that the widespread implementation of digital technologies reduces corruption risks.

The existing results are generally confirmed regarding the crucial role of information and communication technologies in reducing corruption, which increases with the factors of infrastructure, human capital, legal mechanisms and state policy in the field of ICT (Merhi, 2022).

Institutional readiness plays a key role in determining the success of transparency initiatives. Public authorities that have invested in the necessary infrastructure and training programmes that facilitate technology adoption are better positioned to use digital tools effectively. On the contrary, insufficient provision can hinder the integration of technologies, limiting their impact on transparency.

The willingness of stakeholders, both internal (government officials) and external (citizens), to accept and interact with digital technologies is a critical factor. The reliability of data presented through digital platforms directly affects the perception of transparency of public authorities. Regular data audits and compliance with data standards create a transparent and reliable digital landscape.

In the future, it will be necessary to integrate the public administration system for seamless data exchange and interoperability, implementing standardised protocols and data formats. This will ensure the ability to provide a comprehensive and interconnected view of the activities of public authorities. Overcoming disparities in the adoption of technologies is possible through inter-agency partnerships, taking into account management fragmentation at various levels of the managerial hierarchy.

Politically motivated distortions of data or selective disclosure of information limit the effectiveness of the technology and prevent the realisation of anti-corruption opportunities. Increasing transparency challenges established approaches that block inspections, requiring robust legal measures to institutionalise system coverage. Although current open solutions based on blockchain and artificial intelligence demonstrate the potential to increase transparency and minimise corruption risks, insufficient implementation experience, asymmetry of capabilities and institutional inertia hold back large-scale impact.

## **Conclusions**

The study emphasised the potential of digital technologies for transparency, accountability and minimising corruption risks in public administration. Institutional readiness, user engagement, and data quality are important factors in these processes that influence the success of transparency initiatives.

In integrating digital technologies, public authorities face resource limitations and gaps in digital literacy, which require attention to effectively implement transparency-enhancing technologies. The analysis of transparency indicators in Europe demonstrates different levels of change and the dynamics of changes in the studied countries. A moderate dependence of transparency on the

development of information and communication technologies and the level of perception of corruption was revealed.

Although technical systems have, to some extent, expanded access to administrative data, ease of use, and monitoring capabilities, significant improvements in government accountability and citizen trust remain challenging. The main challenges of implementing digital technologies for transparency include: uneven digital development and access, overcoming institutional resistance; ensuring cyber security; data privacy protection; inadequate organisational and technological readiness of authorities. Provided that the fragmentation of systems is avoided and that there is respect for the principles of equal access and legal justice, digitalisation can realise its transformative potential for accountable and transparent governance.

Areas for further research may include analysing patterns and identifying new challenges in implementing technological advances for transparent and effective governance.

### **Recommendations**

Based on the conducted research, with the aim of further implementation by government authorities, it is advisable to propose the following recommendations:

- Ensure institutional readiness of government bodies for the adoption of digital technologies by investing in modern infrastructure (equipment, software, data protection) and developing change management strategies to overcome resistance to technology implementation.
- Enhance the involvement of public servants and citizens by implementing standards and protocols that promote transparency and accountability and increase citizen interaction and awareness regarding the use of digital platforms.
- Improve the regulatory framework and government policies in the digital transformation of public administration (accountability and transparency, confidentiality protection, standardisation of digital platforms).
- Ensure the quality and integrity of data through regular data audits and mechanisms to protect against data leaks and cyber-attacks.
- Conduct regular monitoring and assessment of the results of digital initiatives implementation to enhance transparency (analyse the effectiveness of anti-corruption measures using data, track the level of citizens' trust and perception of government transparency).
- Address digital inequality and involve all citizen groups using digital platforms.

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