

DIGITAL PUBLIC SERVICES AS A FACTOR OF ADMINISTRATIVE EFFICIENCY

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Abstract

The digital transformation of public administration is a major direction of public sector modernisation, as digital services can simplify administrative procedures, improve accessibility, and strengthen interaction between public authorities, citizens, and businesses. This study explores the relationship between the development of digital public services and administrative efficiency in Romania. The research combines a literature review and bibliometric analysis with an exploratory quantitative assessment. Relevant studies were identified in the Web of Science database using terms related to government effectiveness, digital public services for citizens and businesses, public services, and efficiency. A keyword co-occurrence analysis was performed using VOSviewer to identify the main thematic connections. The empirical analysis focuses on Romania and uses Government Effectiveness as the dependent variable, while Digital Public Services for Business, Digital Public Services for Citizens, and Pre-filled Forms are considered independent variables. The evolution of the indicators was examined over time, and their relationships were assessed using Pearson's correlation coefficient and multiple linear regression. The results indicate that Pre-filled Forms has the strongest positive association with Government Effectiveness, suggesting that advanced digitalisation based on data reuse, interoperability, and process automation may be more closely related to administrative effectiveness than the mere availability of online services. Given the limited number of comparable annual observations, the findings should be interpreted as exploratory statistical associations rather than causal relationships.

Keywords: *Digital public services; Government effectiveness; Administrative efficiency; E-government; Pre-filled Forms; Romania*

1. Introduction

The digital transformation of public administration represents one of the main directions of development in the context of increasing expectations among citizens and organisations regarding the accessibility, speed, and quality of public services. The ability of public administration to use digital technologies in service delivery has become an important factor in assessing institutional performance and effectiveness.

The literature highlights that the digitalisation of public administration generates multiple forms of public value, including improved service delivery, increased administrative efficiency, enhanced communication between public authorities and beneficiaries, and strengthened institutional capacity [12]. The relationship between the development of e-government and government effectiveness has been examined by numerous researchers, who have emphasised the multiple links and connections between these dimensions [2], [4]. More efficient public administrations may be better positioned to implement digital reforms, while digitalisation, in turn, can contribute to improving the functioning of public institutions [13].

Services provided to citizens and those addressed to the business sector respond to different needs and involve distinct forms of interaction with public institutions. Government-to-Citizen services emphasise the importance of accessibility, digital skills, and the actual use of digital

services [10], whereas research on Government-to-Business services highlights the role of system quality, operational effectiveness, and the simplification of interactions between the public sector and organisations [11], [8].

Romania has made important progress in the digitalisation of public services; however, significant challenges remain, particularly regarding the repeated submission by citizens of information that is already held by public authorities. The Pre-filled Forms indicator, which reflects the automatic pre-completion of administrative forms, is closely associated with database interoperability. Such interoperability can improve the efficiency of public administration by reducing errors and shortening the time required to process applications [14].

Romanian citizens' perceptions of digital public services indicate that satisfaction with these services depends not only on their technical availability, but also on the quality, accessibility, and ease of use of the services provided [9].

Against this background, the present study aims to explore the relationship between the development of digital public services and administrative effectiveness in Romania. The research combines two complementary components. The first consists of an analysis of the scientific literature identified in the Web of Science database, complemented by a bibliometric co-occurrence analysis designed to highlight the main connections among concepts such as government effectiveness, digital public services, public services, and efficiency. The second component consists of an exploratory quantitative analysis focused on Romania and based on the evolution over time of selected indicators related to digital public administration.

Within the empirical analysis, the Government Effectiveness indicator is considered the dependent variable, while Digital Public Services for Citizens, Digital Public Services for Businesses, and Pre-filled Forms are used as independent variables. The relationships among the variables are analysed using Pearson's correlation coefficient and multiple linear regression, complemented by an examination of the indicators' evolution over time.

Given the limited availability of comparable time-series data for all the variables included in the analysis, the research has an exploratory character. The relatively small number of observations requires cautious interpretation of the results and does not allow definitive causal conclusions to be drawn. Instead, the analysis seeks to identify trends and associations that may provide a basis for future research using longer time periods or cross-country comparisons.

2.Literature Review

The digitalisation of public administration has become one of the essential components of the contemporary process of public sector modernisation. The concept of e-government has gradually evolved from the simple online provision of public information towards integrated models of digital governance based on interoperability, data reuse, the automation of administrative processes, and the delivery of user-centred services. The benefits associated with digitalisation are multiple. The assessment of digital performance should therefore go beyond the mere existence of electronic platforms and should also examine their effects on public administration processes and outcomes [12].

Digitalisation simplifies citizens' interaction with public administration while, at the same time, generating internal benefits for public institutions through process standardisation, the reduction of repetitive activities, and more efficient use of resources [1]. Digital transformation entails a fundamental reconsideration of the relationship between citizens and public administration [7]. The performance of digital services should be analysed not only from the perspective of the services provided by public authorities, but also in terms of citizens' ability to use them effectively. This distinction is particularly important when assessing indicators such as Digital Public Services for Citizens [10]. The digitalisation of public administration in Romania should therefore be approached both from the perspective of infrastructure and platform development and from that of end users and their willingness and ability to adopt the services provided [9]. Digital transformation

can contribute to increasing the efficiency of service delivery, enhancing citizen engagement, and strengthening government accountability [6].

The literature also places considerable emphasis on the digital relationship between public administration and the business environment [8]. The digitalisation of interactions with businesses should not be assessed solely in terms of the availability of electronic services, but also in terms of their actual capacity to simplify users' activities and administrative processes [11].

Within advanced digital public services, particular importance is attached to process automation and the reuse of data already available within public administration systems. The Pre-filled Forms indicator is especially relevant to this dimension. The reuse of data across institutions, while ensuring compliance with data protection requirements, can simplify public services and reduce the administrative burden [14]. A recent study [3], in its analysis of the transformation of digital public services across the European Union, develop a measure of digitalisation that integrates several dimensions, including e-government use, pre-filled forms, digital public services for citizens, and digital public services for businesses. This operationalisation highlights the multidimensional nature of digital government maturity and suggests that it cannot be adequately captured through a single general indicator [3].

To complement the literature review, articles indexed in the **Web of Science (WoS)** database containing the terms “government effectiveness”, “digital public for citizens”, “digital public for business”, “public services”, and “efficiency” were identified. In order to examine the main thematic relationships among these concepts, a **co-occurrence analysis** was conducted using **VOSviewer**.

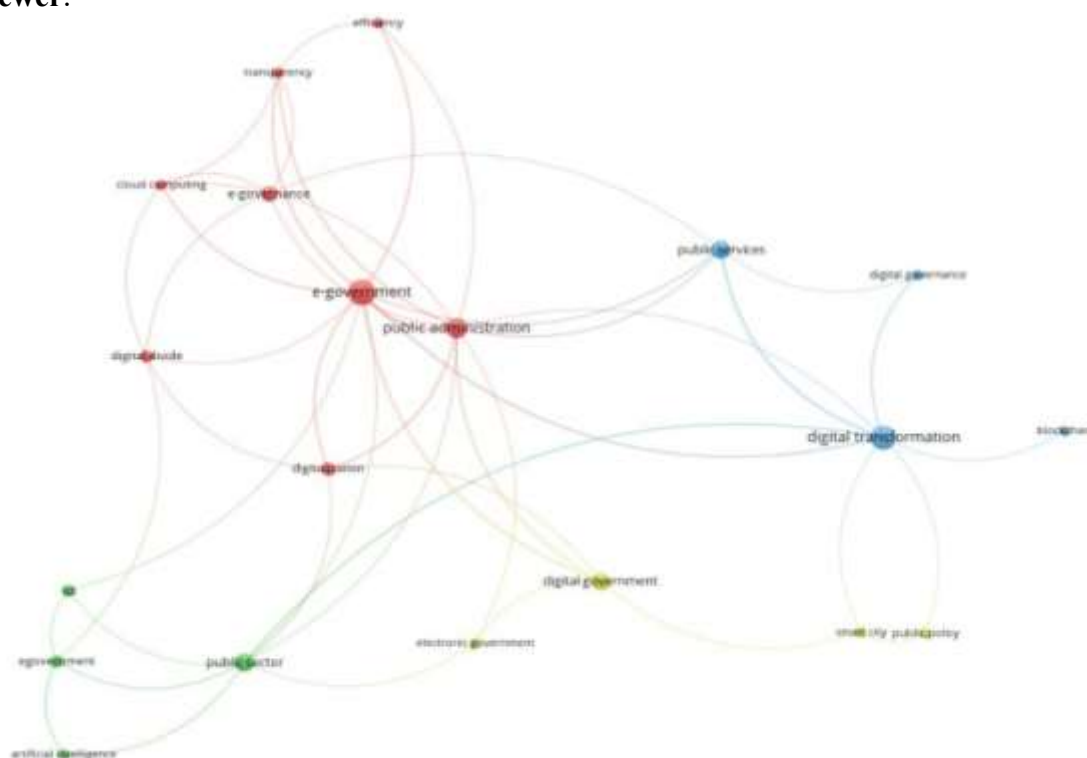


Fig. no. 1. Co-occurrence analysis

Source: Authors' own elaboration using VOSviewer, based on data retrieved from the Web of Science Core Collection.

The keyword co-occurrence analysis reveals a complex conceptual structure within the literature on the digitalisation of public administration, with four main thematic clusters being identified. The first cluster is centred on the concepts of e-government and public administration and includes terms such as e-governance, transparency, efficiency, digitalization, digital divide, and cloud computing. The configuration of this cluster highlights a research direction focused on the

institutional and managerial implications of digitalisation, with particular emphasis on administrative efficiency, transparency, and access to electronic services.

The second cluster is dominated by the concept of digital transformation, which is associated with public services, digital governance, and blockchain. The connection between digital transformation and public services suggests significant scholarly interest in the effects of digitalisation on the relationship between public institutions and citizens.

The third cluster brings together the concepts of public sector, ICT, eGovernment, and artificial intelligence, reflecting the technological dimension of public sector modernisation. The presence of artificial intelligence indicates the emergence of new research directions related to advanced technologies, although the relatively peripheral position of this term suggests that this topic is less consolidated than the more traditional areas of e-government research.

The fourth cluster groups the concepts of digital government, electronic government, smart city, and public policy, highlighting the strategic and public policy dimensions of digital transformation. The association between smart city and public policy suggests the progressive integration of digital technologies into public policy formulation and implementation processes, as well as the expansion of digital transformation towards the level of urban ecosystems.

Overall, the structure of the network indicates an evolution of the literature from approaches centred primarily on e-government and the computerisation of public administration towards more complex perspectives concerning digital transformation, digital governance, and the use of emerging technologies in the public sector.

3. Research Methodology

The research is exploratory in nature and involves a quantitative analysis of selected indicators related to the digitalisation of public services and government effectiveness in Romania.

In the first stage, a review of the relevant literature was conducted using the Web of Science (WoS) database. The search was based on the terms “government effectiveness”, “digital public for citizens”, “digital public for business”, “public services”, and “efficiency”. To identify the main thematic relationships among the concepts, a co-occurrence analysis was performed using VOSviewer.

In the second stage of the research, a quantitative analysis was carried out. The dependent variable was Government Effectiveness, while the independent variables were Digital Public Services for Businesses, Digital Public Services for Citizens, and Pre-filled Forms.

For each indicator, its evolution over time was examined through graphical representations in order to identify the main trends. The relationships among the variables were subsequently assessed using Pearson’s correlation coefficient, which was employed to determine the strength and direction of the associations between the indicators.

Subsequently, a multiple linear regression analysis was conducted, with Government Effectiveness as the dependent variable and the three aforementioned digital public service indicators as independent variables.

Given that comparable data were available for only nine annual observations, the analysis does not aim to establish causal relationships, but rather to identify associations and trends between the development of digital public services and government effectiveness in Romania.

4. Results and Discussion

In the first part of the empirical analysis, the evolution over time of all indicators included in the research was examined through graphical representations in order to identify the main trends.

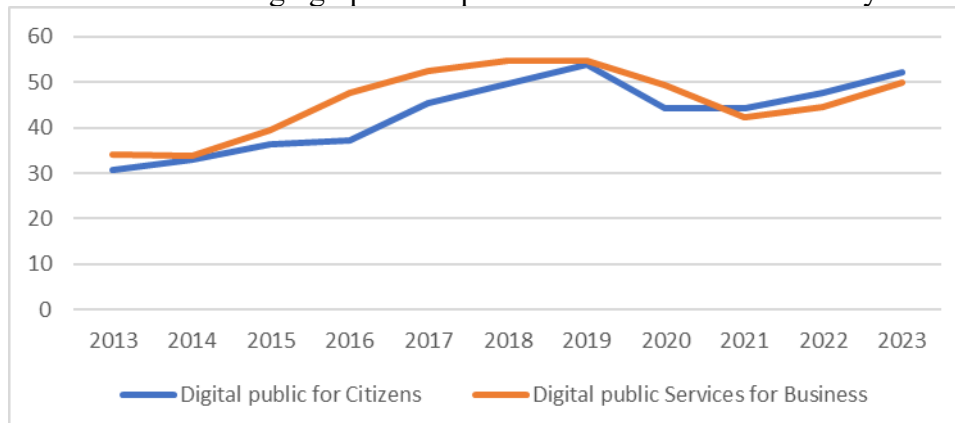


Fig. no. 2. Evolution of Digital Public Services for Citizens and Businesses (2013–2023)

Source: Authors' own processing based on European Commission [5].

As can be observed, the graph illustrating the evolution of digital public services for citizens and businesses (Fig. no. 2) shows an overall improvement in the level of digital public services provided to both citizens and the business sector during the 2013–2023 period, although the evolution was not linear.

The evolution of the Pre-filled Forms indicator reveals two distinct stages in the administrative digitalisation process. During the 2014–2020 period, the relatively low and fluctuating level of the indicator suggests limited use of mechanisms for the automatic reuse of data in the provision of digital public services. However, starting in 2021, a significant acceleration can be observed, culminating in a value exceeding 40 points in 2022, indicating an improvement in the efficiency of public service delivery.

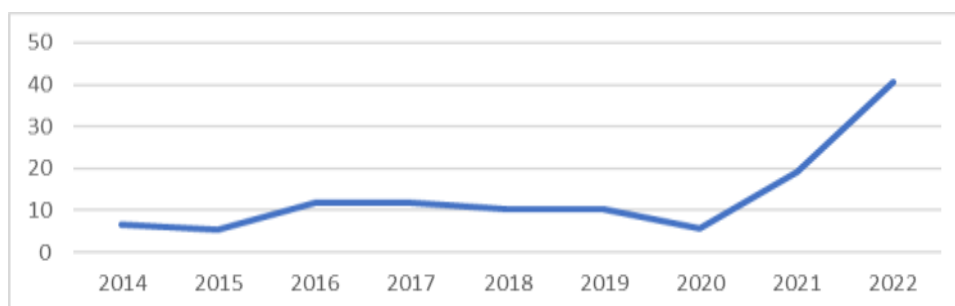


Fig. no. 3. Evolution of the Pre-filled Forms indicator

Source: Authors' own processing based on European Commission [5].

The evolution of the Government Effectiveness – Percentile Rank indicator shows an overall long-term improvement in government effectiveness, despite the fluctuations recorded during certain periods.

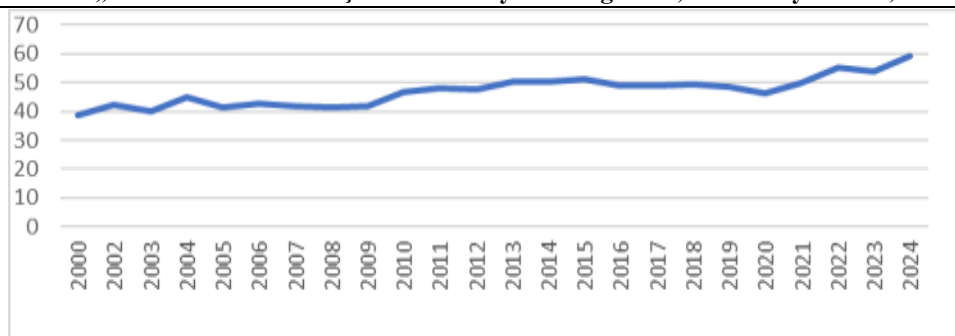


Fig. no. 4. Evolution of Government Effectiveness – Percentile Rank

Source: World Bank, *Worldwide Governance Indicators (WGI)*, DataBank [15].

To investigate the relationship between the digitalisation of public services and government effectiveness in Romania, the period 2014–2022 was analysed. The dependent variable used in the model was Government Effectiveness, while the independent variables were represented by the indicators Digital Public Services for Business, Digital Public Services for Citizens, and Pre-filled Forms. In the first stage, Pearson correlation coefficients were calculated, followed by the estimation of a multiple linear regression model in order to identify the individual contribution of each dimension of digitalisation to explaining the variation in government effectiveness.

The Pearson correlation analysis (Table no. 1) reveals differentiated relationships among the variables included in the study. The strongest relationship with government effectiveness was identified for the Pre-filled Forms indicator, for which the Pearson correlation coefficient was positive and relatively high ($r = 0.797$; $p = 0.010$). This result indicates a statistically significant positive association between the degree of pre-filling of electronic forms and the level of government effectiveness during the analysed period.

Table no. 1. Pearson Correlation Analysis

Correlation	r	p-value
Government Effectiveness – Business	-0.41	0.273
Government Effectiveness – Citizens	-0.07	0.857
Government Effectiveness – Pre-filled forms	0.797	0.01
Business – Citizens	0.81	0.008
Business – Pre-filled forms	-0.028	0.943
Citizens – Pre-filled forms	0.323	0.396

Source: Authors' own processing in Microsoft Excel.

The regression statistics are presented in Table no. 2. The results of the multiple linear regression confirm that the model has substantial explanatory power. The coefficient of determination is $R^2 = 0.786$, indicating that approximately 78.6% of the variation in government effectiveness within the analysed sample can be explained by the combined variation of the three digital public service indicators.

Table no. 2. Regression Statistics

Model Summary		
Statistic	Value	
Multiple R	0.886354	
R Square	0.785624	
Adjusted R Square	0.656998	
Standard Error	1.395073	
Observations	9	
ANOVA		

Source	df	SS	MS	F	Significance F	
Regression	3	35.66174	11.88725	6.107836	0.039877	
Residual	5	9.731145	1.946229			
Total	8	45.39289				
Coefficients						
Variable	Coefficient	Std. Error	t Stat	p-value	Lower 95%	Upper 95%
Intercept	53.67204	3.385895	15.85165	1.82E-05	44.96832	62.37576
Digital Public Services for Business	-0.11723	0.137967	-0.84966	0.4343	-0.47188	0.23743
Digital Public Services for Citizens	-0.01557	0.153049	-0.10175	0.922906	-0.409	0.377852
Pre-filled Forms	0.173088	0.055433	3.122454	0.02618	0.030592	0.315584

Source: Authors' own processing in Microsoft Excel.

The ANOVA test indicates that the regression model is statistically significant overall ($F = 6.108$; $p = 0.040$), with the probability value being below the 0.05 significance threshold. Therefore, the variables related to the digitalisation of public services, when considered simultaneously, are significantly associated with government effectiveness during the 2014–2022 period.

Overall, the results suggest that, among the dimensions of digitalisation analysed, Pre-filled Forms is the indicator most strongly associated with government effectiveness. The pre-filling of administrative forms using information already available within public administration systems may reflect a more advanced level of integration and interoperability of digital services and, in the analysed data, is associated with higher levels of government effectiveness. However, the results should be interpreted with caution, given the limited number of observations, as comparable data were available for only nine years. For this reason, the analysis is predominantly exploratory in nature, and the identified relationships should be interpreted as statistical associations rather than causal relationships.

5. Conclusions, Limitations, and Future Research Directions

The results of the study highlight that the digitalisation of public services may be associated with the level of administrative effectiveness; however, the strength of these relationships differs depending on the dimension of digitalisation considered. Among the indicators included in the analysis, Pre-filled Forms showed the strongest positive association with Government Effectiveness, suggesting that more advanced forms of digitalisation, based on data reuse, process automation, and the simplification of administrative procedures, may be more closely related to public administration performance than the mere availability of online services.

By contrast, the relationships between Government Effectiveness and Digital Public Services for Citizens, as well as Digital Public Services for Businesses, were weaker. This finding suggests that the development of digital services does not automatically lead to a comparable increase in government effectiveness. When assessing the digital maturity of public administration, it is therefore important to consider not only the availability of online services, but also the depth of administrative process transformation, including data reuse and the reduction of the administrative burden for users.

The main limitation of the study is the relatively small number of observations, as the analysis was conducted for only nine years, corresponding to the period for which comparable data were available for all variables. In addition, the relationships among the variables may also be influenced by other factors not included in the model, such as the population's digital skills, the level of economic development, digital infrastructure, and citizens' trust in public administration.

Future research could extend the analysed period as new data become available and could include a larger number of European Union Member States. The model could also be expanded by

incorporating additional variables related to the use of e-government services, digital skills, the quality of governance, and citizen satisfaction.

In conclusion, the findings support the idea that the digital transformation of public administration should be assessed beyond the mere presence of services in the online environment. The integration, automation, and simplification of administrative processes represent important dimensions for understanding the relationship between digitalisation and the effectiveness of public administration.

7. References

- [1] Axelsson, K., Melin, U., & Lindgren, I. (2013). *Public e-services for agency efficiency and citizen benefit—Findings from a stakeholder centered analysis*. Government Information Quarterly, 30(1), 10–22. doi:10.1016/j.giq.2012.08.002.
- [2] Chen, L., & Aklikokou, A. K. (2021). *Relating e-government development to government effectiveness and control of corruption: A cluster analysis*. Journal of Chinese Governance, 6(1), 155–173. doi:10.1080/23812346.2019.1698693.
- [3] Dincă, G., Bărbuță, M., & Dincă, D. (2025). *Crisis as a catalyst: Difference-in-differences evidence on digital public service transformation in the European Union*. Administrative Sciences, 15(10), 393. doi:10.3390/admsci15100393.
- [4] Doran, N. M., Puiu, S., Bădîrcea, R. M., Pirtea, M. G., Doran, M. D., Ciobanu, G., & Mihit, L. D. (2023). *E-Government development—A key factor in government administration effectiveness in the European Union*. Electronics, 12(3), 641. doi:10.3390/electronics12030641.
- [5] European Commission. (2026). *Digital Decade DESI visualisation tool*. https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/key-indicators/charts/see-the-evolution-of-an-indicator-and-compare-countries?indicator=e_pmd&breakdown=ent_all_xfin&unit=pc_ent&country=EU,RO
- [6] Latupeirissa, J. J. P., Dewi, N. L. Y., Prayana, I. K. R., Srikandi, M. B., Ramadiansyah, S. A., & Pramana, I. B. G. A. Y. (2024). *Transforming public service delivery: A comprehensive review of digitization initiatives*. Sustainability, 16(7), 2818. doi:10.3390/su16072818.
- [7] Lindgren, I., Madsen, C. Ø., Hofmann, S., & Melin, U. (2019). *Close encounters of the digital kind: A research agenda for the digitalization of public services*. Government Information Quarterly, 36(3), 427–436. doi:10.1016/j.giq.2019.03.002.
- [8] Panayiotou, N. A., & Stavrou, V. P. (2021). *Government to business e-services—A systematic literature review*. Government Information Quarterly, 38(2), 101576. doi:10.1016/j.giq.2021.101576.
- [9] Popescu, M. A. M., Barbu, A., Moiceanu, G., Costea-Marcu, I.-C., Militaru, G., & Simion, P. C. (2024). *Citizens' perception of digital public services: A case study among Romanian citizens*. Administrative Sciences, 14(10), 259. doi:10.3390/admsci14100259.
- [10] Rodríguez-Hevia, L. F., Navío-Marco, J., & Ruiz-Gómez, L. M. (2020). *Citizens' involvement in e-government in the European Union: The rising importance of the digital skills*. Sustainability, 12(17), 6807. doi:10.3390/su12176807.
- [11] Santa, R., MacDonald, J. B., & Ferrer, M. (2019). *The role of trust in e-Government effectiveness, operational effectiveness and user satisfaction: Lessons from Saudi Arabia in e-G2B*. Government Information Quarterly, 36(1), 39–50. doi:10.1016/j.giq.2018.10.007.
- [12] Twizeyimana, J. D., & Andersson, A. (2019). *The public value of E-Government—A literature review*. Government Information Quarterly, 36(2), 167–178. doi:10.1016/j.giq.2019.01.001.
- [13] Wallis, J., & Zhao, F. (2018). *e-Government development and government effectiveness: A reciprocal relationship*. International Journal of Public Administration, 41(7), 479–491. doi:10.1080/01900692.2016.1273950.

[14] Wimmer, M. A. (2021). *Once-only principle good practices in Europe*. In R. Krimmer, A. Prentza, & S. Mamrot (Eds.), *The Once-Only Principle* (pp. 61–82). Springer. doi:10.1007/978-3-030-79851-2_4.

[15] World Bank. *Worldwide Governance Indicators (WGI), World Development Indicators DataBank*.
<https://databank.worldbank.org/source/worldwide-governance-indicators/Type/TABLE/preview/on>