OECD Working Papers on Public Governance

OECD Digital Government Index (DGI): Methodology and 2019 Results

Abstract

This Working Paper presents the process, methodology and results of the OECD 2019 Digital Government Index (DGI). It has three key objectives. First, the paper describes the design, the content and the methodology of the pilot OECD Survey on Digital Government 1.0 and outlines the data collection and verification process. Second, it presents the outcomes of different statistical tests to assess the robustness of the results, including tests to evaluate the sensitivity of the indicators to various weighting schemes. Third, the paper presents countries' composite results and scores by each of the six dimensions comprised in the OECD Digital Government Policy Framework. Lastly, the paper outlines the key findings and messages based on these results.

Acknowledgements

The *OECD Digital Government Index (DGI): Methodology and 2019 Results* was prepared by the Directorate for Public Governance (GOV), under the leadership of its Acting Director, Janos Bertok.

This working paper was produced by GOV's Open and Innovative Government Division (OIG). It was written by Barbara Ubaldi, Acting Head of the Open and Innovative Government Division and Head of the Digital Government and Open Data Unit; and Tomoya Okubo, statistical consultant to the OECD.

Edwin Lau, Senior Counsellor to the Director for Public Governance; Monica Brezzi, Head of the Governments Indicators and Performance Evaluation Division (GOV/GIP); and Paul Schreyer, Acting Chief Statistician and Acting Director of the Statistics and Data Directorate (SDD), provided insightful and strategic comments to the paper. The authors are also grateful to Felipe González-Zapata, Policy Analyst, Digital Government and Data Unit and Mariane Picinnin Barbieri for their support in the finalisation of this report; and to Andrea Uhrhammer and Amelia Godber (GOV) for editorial assistance.

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Introduction

The OECD Survey on Digital Government 1.0 was designed to monitor the implementation of the OECD Recommendation of the Council on Digital Government Strategies adopted on July 15, 2014. The Recommendation is the first international legal instrument on digital government. The Recommendation calls for a paradigm shift, from e-government to Digital Government and aims to bring governments closer to citizens and businesses through the adoption of strategic approaches in the use of technology to spur more open, participatory and innovative governments. According to the Recommendation, digital government is understood as "the use of digital technologies, as an integrated part of governments' modernisation strategies, to create public value" (OECD, 2014).

The assessment is based on a theoretical framework, built on the Recommendation, which embeds 6 main dimensions characterising a fully digital government (*Digital by design, Data-driven public sector, Government as a platform, Open by default, User-driven* and *Proactiveness*) and four Transversal facets (Strategic approach, Policy levers, Implementation and Monitoring). Therefore, countries are measured on the different dimensions, each capturing one or more of the 12 key recommendations.

This Methodology Working Paper reveals that the pilot OECD Survey on Digital Government 1.0 is statistically sound in terms of coherence and balance. The six dimensions that form the composite score seem to measure distinct aspects of a common underlying phenomenon. This is supported by the moderately strong level of correlation found across the six dimensions. Finally, various tests used to evaluate convergent validity (whether the measure correlates well with other proxy measures of the same concept) and construct validity (whether the measure behaves as suggested by theory and common sense) appear satisfactory. Further research is needed to assess empirically the relationship between digital government policies and practices and broader societal outcomes including economic and social outcomes and the performance and efficiency of the public sector.

Methodology

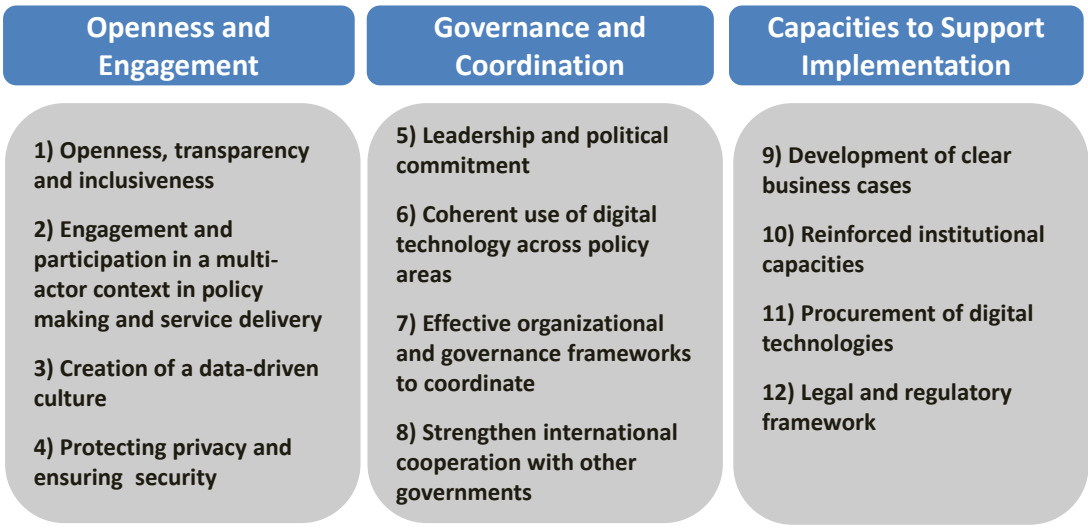
Rationale

The current context has reinforced digital maturity as an important factor in securing proactive, efficient and user-driven policies and services. More than ever, governments across the world are being challenged to adapt, manage and embrace the disruption brought by the digital transformation. By becoming digital, the public sector is better equipped to meet citizens' changing expectations, stay relevant and considerably improve policy-making and public service delivery in the 21st century. Lagging behind can bring risks of policy failure and delivering outdated and irrelevant services in a context where users' needs are constantly changing.

To adapt to such a dynamic scenario, the OECD Recommendation of the Council on Digital Government Strategies was adopted on July 15, 2014. The Recommendation aims to help governments adopt more strategic approaches in the use of technologies to spur more open, participatory and innovative governments. Thus, the principles set out in the Recommendation advocate for a cultural change within the public sector from the use of technologies to support better public sector operations to integration of strategic decisions on digital technologies in the shaping of government strategies and policies for public sector reform and modernisation (OECD, 2014).

The Recommendation offers a whole-of-government approach that addresses the cross-cutting role of technology in the design and implementation of public policies, and in the delivery of outcomes. It provides guidelines for countries whatever their level of digital government maturity, institutional framework and degree of decentralisation might be. It does so through 12 key recommendations, organised in three pillars: *i.* Openness and Engagement; *ii.* Governance and Coordination; and *iii.* Capacities to Support Implementation (see Figure 1).

Figure 1. The OECD Recommendation on Digital Government Strategies



Source: Based on the OECD Recommendation of the Council on Digital Government Strategies (OECD, 2014[1]).

The OECD designed the Survey on Digital Government 1.0 to monitor the implementation of the Recommendation and to assist governments in assessing the progress made in their evolution from e-government to digital government. Advances made by governments are measured based on a "6 by 6" theoretical framework – which embeds the aforementioned dimensions that characterise digital government. The framework is based on the Recommendation of the Council on Digital Government Strategies and each dimension covers one or more of the 12 key recommendations.

The Survey on Digital Government 1.0 represents a pilot effort to translate the OECD Digital Government Policy Framework (DGPF) into a concrete set of areas and indicators to benchmark the progress of digital government reforms across OECD Member and key partner countries. This Survey is so far the only one to measure the progress towards digital government. Other relevant instruments have concentrated on assessing the progress of e-government readiness and the extent of e-participation. For instance, the United Nations E-government Survey does it according to a quantitative composite index of readiness and the capacity of the public sector organisations to deliver services based on website assessment, telecommunications infrastructure, and human resource endowment.

Another example is the EU E-Government Benchmark, which takes into account the Tallinn Ministerial Declaration 2017, Digital Single Market Vision, and broader EU2020 goals. It is a monitoring instrument of the European Commission to provide insight into the use of information and communications technologies (ICT) in the public sector. Among its components, it evaluates the maturity of public services in terms of user centricity (availability of online services), transparency (implementation of good transparent service procedures), cross-border services, and use of key technological enablers.

Unlike the other measurement instruments, the Survey on Digital Government 1.0 emphasises the crucial contribution of technology as a strategic driver to create open, innovative, participatory and trustworthy public sectors, to improve social inclusiveness and government accountability, and to bring together government and non-government actors to contribute to national development and long-term sustainable growth. Helping governments to understand their advances in the path towards digital government is essential, as this supports a strategic deployment and use of digital technologies and data towards more

innovative, open and efficient governments, thus strengthening the conditions for trust, resilience and agility to adapt and manage social and economic disruptions.

Survey design and data validation

In order to make the survey design process inclusive, a Workshop on Digital Government Indicators took place in September 2016, with the purpose of sharing information on existing country practices, discussing and approving a timeline for the development of a new generation of OECD Digital Government Indicators. In March 2018, a webinar was conducted to validate the pilot version of the Indicators concerning pertinence, relevance and data collection feasibility.

Furthermore, between February and May 2018, a Digital Government Indicators Task Force was formed by OECD member countries and key partners[1], which successfully nurtured internal discussions, ensured accuracy and relevance of the Survey questions and flagged possible biases. Finally, an OECD Digital Government Indicators session held during the OECD Working Party of Senior Digital Government Officials (E-Leaders) meeting, in September 2019, counted as a delegates' feedback session to gather constructive inputs.

The Survey is composed of 94 questions covering each of the dimensions and transversal facets. In some cases, a number of questions include sub-questions. Survey respondents were high-level digital government officials of 29 OECD Member countries[2] and 4 non-Member countries. The Survey applied to the central/federal level of government, covering all central/federal ministries and agencies. Data was collected via the Digital Government Survey 1.0 considering evidence until August 2018[3].

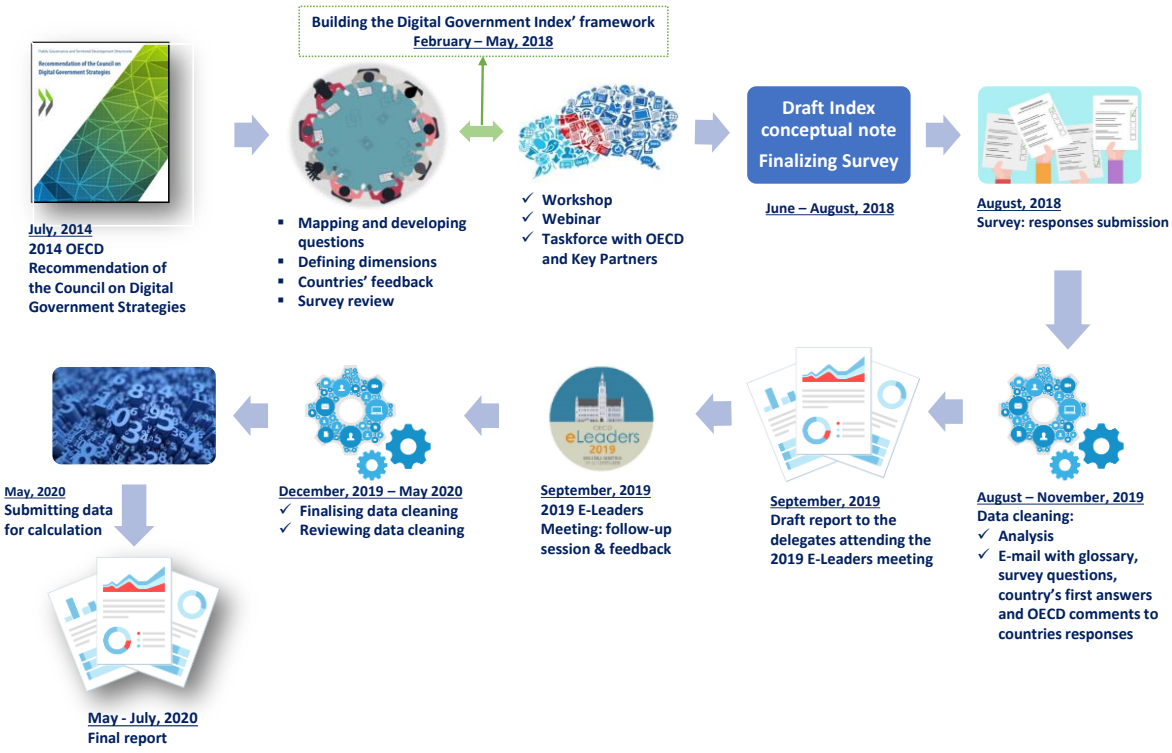
The overall data collection, cleaning and publication timeline are shown in Figure 2. The data cleaning process followed a series of steps designed to systematically ensure the highest standards in data quality and accuracy, both before the Survey was launched and after the data were collected. A glossary of terms was sent to delegates jointly with the 94 questions of the OECD Survey on Digital Government 1.0. Data cleaning rounds were followed with country delegates by checking for internal and external consistency in the responses, comparing prior and later responses and verifying that supporting evidence was systematically provided before their final validation. Before finalising the process, a final review of the evidence was conducted to ensure consistency in results. This final exercise with the pilot version of the Survey kicked off the process of better understanding and re-designing the questions for the next edition. For further details about the upcoming steps for designing and improving the next edition of the Survey, please consult the "Future Work" section in the OECD 2019 Digital Government Index policy paper.

[1] The Digital Government Indicators Taskforce was formed in 2018 and included OECD member countries and key partners, namely, Belgium, Canada, Colombia, Italy, Denmark, Mexico, Netherlands, Portugal, Spain, United Kingdom and Uruguay.

[2] For the purposes of the OECD average, Colombia was included in the calculation since the country became officially a member of the OECD before the results were published, this is, on April 28th 2020.

[3] The *Open by default* dimension includes 7 questions gathered from the 2018 Open Government Data Survey (4th Edition) for 29 countries also participating in the DGI, while for 3 Latin American countries data was gathered through the Government at a Glance Survey 2019. Data from Iceland was collected through the Digital Government Survey 1.0.

Figure 2. Timeline for the Survey on Digital Government 1.0



Source: Authors

Construction of the dataset

All responses were recoded using numerical values with a maximum value equal to "1" corresponding to the best practices. Variables were re-coded in the following way:

- **Binary type questions ("Yes"/"No")**: a value of 1 was awarded for "Yes" and a value of 0 for "No".
- **"Choose one" type questions**: answers weighted differently according to qualitative assessment.
- **"Choose as many that apply" type questions with options of same weight**: in case selected answers have all the same weight, points sum up and are attributed equally to each of the answer options (for instance, in case there are three answer options and the three were selected, the final score will be the sum of the value attributed to each selected option – 1/3 + 1/3 + 1/3 = 1).
- **"Choose as many that apply" type questions with options of different weight**: answers weighted differently according to qualitative assessment (for instance, three questions 0.25, 0.75, 1).

There were no missing values in the questionnaires4. Items are assigned to one of the six dimensions (i.e., digital by design, government as a platform, open by default, data-driven public sector, user-driven and proactiveness) and one of the four transversal facets (i.e., strategic approach, policy levers, implementation and monitoring). Table 1 shows item allocation for the dimension and transversal facets.

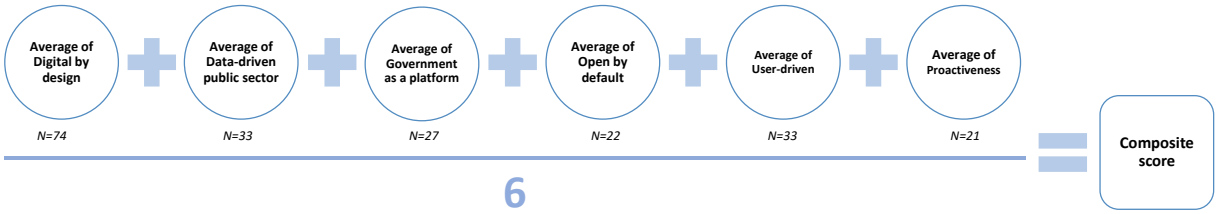
Table 1. Total Survey Items per Dimension and Transversal Facets

Dimensions	*Transversal Facets*			
	Strategic approach	*Policy levers*	*Implementation*	*Monitoring*
Digital by design	6	45	12	11
Data-driven public sector	3	20	8	2
Government as a platform	5	12	8	2
Open by default	1	7	9	5
User-driven	11	6	11	5
Proactiveness	7	3	10	1

Source: OECD

Within the Digital Government Survey 1.0, a dimension score is defined as the average score of items assigned to the dimension. The composite score is calculated as the average of the dimension scores; thus, it is not affected by the size of each dimension (see Figure 3). This scoring rule allows us to have only one consistent composite score for each country. The transversal facets are only used for qualitative purposes to complement the quantitative analysis performed with the six dimensions.

Figure 3. Calculation of Composite Score



Source: Authors

Statistical Analyses

Four types of statistical analyses were conducted to ensure the highest standards of reliability and validity of the Survey. The analyses were conducted with the scored data in which missing data were treated as zero. Some items and scoring rules were revised according to results of the statistical analyses to keep quality of the survey high. The items shown in Table 1 cleared both criteria of reliability and validity.

[4] All questions left with no response ("missing values") scored 0. "Other, please specify" type questions were assessed and classified accordingly in one of the other question options, when applicable, for score attribution. Consistency was ensured among similar questions or which answers depended on other questions.

Descriptive statistics and correlation analysis of items

Descriptive statistics were checked to see distribution of dimension scores. Average of the scores should not be extremely low or high, since it implies the items cannot discriminate countries well. There was no item whose average was value of 0.0 or 1.0, which should be removed if existed. In addition to it, correlation coefficients between the item scores and dimension scores were calculated in order to check construct validity of the items. Polyserial correlation[5] was employed if the number of categories for an item was less than 4, otherwise Pearson's correlation[6] was employed. Items whose correlation coefficients were less than 0.1 were considered to be reallocated or eliminated. Therefore, all the items that were used for calculating the composite scores have been confirmed with their item validity.

Descriptive statistics of dimensions scores are shown in Table 2. Average scores of dimensions were distributed around 0.5, except *Open by default,* whose average was 0.635 and the SDs were exceeded by 0.30. This indicates the scores were widely distributed among countries; therefore, the items work well in terms of discriminating the countries. The discrepancy between the average and the median of *Open by default* shows that score distribution is slightly skewed from normal distribution, which implies some of countries have very high scores in the dimension.

Table 2. Descriptive statistics of dimension scores

Dimension	Average	SD	25th percentile	Median	75th percentile
Digital by design	0.541	0.241	0.336	0.542	0.723
Data-driven public sector	0.437	0.255	0.242	0.424	0.636
Government as a plat form	0.533	0.141	0.451	0.512	0.652
Open by default	0.635	0.307	0.333	0.561	0.905
User-driven	0.456	0.161	0.364	0.435	0.545
Proactiveness	0.410	0.211	0.242	0.364	0.545

Source: OECD

Cronbach alpha testing (measurement of internal consistency)

In order to confirm reliability of the dimension scores, Cronbach's alpha coefficients (α) were calculated. This index is a measure of internal consistency that indicates the degree of reliability and reproducibility of items. It is widely used in psychometrics and related field since 1951 (Cronbach, 1951[2]). It ranges from 0.0 to 1.0. According to DeVellis (2016[3]), the following expression is used for interpretation of α; $0.9 \leq \alpha$: Excellent, $0.8 \leq \alpha < 0.9$: Good, $0.7 \leq \alpha < 0.8$: Acceptable, $0.6 \leq \alpha < 0.7$: Questionable, $0.5 \leq \alpha < 0.6$: Poor, $\alpha < 0.5$: Unacceptable.

Calculated Cronbach's alpha (α) are shown in Table 3. We can confirm acceptable/good/excellent internal consistency for all dimensions. Cronbach's alpha is a function of the number of items; therefore, the Cronbach's alpha of *Open by default* is lower than the other dimensions. This does not mean the concept of *Open by default* is less reliable than the other dimensions. A value of 0.666 is still acceptable considering the total number of items assigned to the dimension. The Cronbach's alpha coefficients are an evidence of good quality of the scores calculated in this questionnaire.

[5] Correlation coefficient between a continuous variable and a discrete variable.

[6] Correlation coefficient between a continuous variable and a continuous variable.

Table 3. Cronbach's alpha coefficients of each dimension

	N of items	Cronbach's alpha
Digital by design	74	0.912
Data-driven public sector	33	0.780
Government as a platform	27	0.858
Open by default	22	0.666
User-driven	33	0.900
Proactiveness	21	0.791

Source: OECD

Structure of items

Correlation analysis was conducted with two objectives. First, to identify variables that are extremely highly correlated and that might denote signs of redundancy/collinearity. Variables with high collinearity were either dropped or merged into a single variable to avoid double counting and over-weighting certain responses. Second, to test the accuracy of the indicators produced and, notably, convergent validity (whether the measure correlates well with other proxy measures of the same concept) and construct validity (whether the measure behaves as suggested by theory and common sense) (González, Fleischer and Mira d'Ercole, 2017[4])

Correlation matrix of the average scores for dimensions are shown in Table 4. This table shows the relationship among dimensions and help us understanding the structure of the survey. In overall, the scores were highly correlated to each other, which implies they were measuring similar concepts. The correlation between *Open by default* and *Proactiveness* (dim.3 and dim.6) was significantly lower than the others. This is because 1) *Open by default* measured a slightly different aspect from what the other dimensions commonly did, and 2) *Proactiveness* also measured independent component from the others, especially from *Open by default.* In overall, dimension scores were correlated to each other, thus, we confirmed constructed validity of this survey through the results.

Table 4. Correlation matrix of average scores for dimensions (dim.)

	dim.1	dim.2	dim.3	dim.4	dim.5	dim.6
dim.1 (Digital by design)	1.000	0.666	0.553	0.732	0.836	0.664
dim.2 (Government as a platform)	0.666	1.000	0.467	0.700	0.675	0.451
dim.3 (Open by default)	0.553	0.467	1.000	0.413	0.634	0.199
dim.4 (Data-driven public sector)	0.732	0.700	0.413	1.000	0.747	0.571
dim.5 (User-driven)	0.836	0.675	0.634	0.747	1.000	0.650
dim.6 (Proactiveness)	0.664	0.451	0.199	0.571	0.650	1.000

Source: OECD

Correlation analysis of composite scores

The composite score was calculated as the average of the six dimension scores. Therefore, the difference of the number of items among dimensions did not affect the composite score, and the scores of the dimensions were treated equally. Please note that each dimension score was calculated as an average of all items that belong to the dimension. In total, the number of data points of the composite score was 210. The Cronbach's alpha coefficients of the composite score was 0.964, and could confirm excellent reliability of the measurement. The correlation coefficients between the composite scores and scores of dimensions are shown in Table 5. As previously mentioned , correlation coefficients between the composite score,

Open by default and Proactiveness are lower than the other four dimensions, which implies those two dimensions measure slightly independent aspects from what the composite score does.

As a summary of this section, we confirmed unidimensional concepts measured with the 210 items designed under the six dimensions. The result of the analyses justified discussing country differences with both the composite score and the dimensions scores.

Table 5. Correlation coefficients between the composite score and dimension scores

Dimension	Composite score
Digital by design	0.905
Data-driven public sector	0.845
Government as a platform	0.822
Open by default	0.645
User-driven	0.932
Proactiveness	0.736

Source: OECD

Results

The OECD Digital Government Policy Framework

Advances made by governments to evolve towards digital government are measured based on a "6 by 6" theoretical framework – which embeds the main dimensions that characterise digital government. The framework is based on the Recommendation of the Council on Digital Government Strategies; and each dimension covers one or more of the 12 key recommendations. Therefore, the measurement based on the theoretical framework below also provides a basis to monitor efforts made by the governments to progress in the implementation of the Recommendation.

Building on the Recommendation, the OECD has developed a Digital Government Policy Framework (DGPF) to support decision-makers and public servants in the shift towards digital government (OECD, 2020[5]). The DGPF provides a basis to measure the level of countries' digital government maturity across the six dimensions, categorising them as foundational and transformational digital government components (see Table 6).

Foundational dimensions refer to the building blocks for digital government to occur. It comprises governance mechanisms, principles and tools that enable effective digital government reforms and allow policy makers in designing and delivering services focusing in agility, responsiveness and proactivity. Foundational dimensions comprise *Digital by design*, *Government as a platform*, *Open by default* and *Data-driven public sector*. The transformational dimensions, which comprises *User-driven* and *Proactiveness*, build on the four previous dimensions. Transformational dimensions relate to the set of efforts from public sector organisations in using digital technologies and data to proactively operate focusing on people's needs.

Table 6. OECD Digital Government Policy Framework

Dimension	*Concept measured*
Digital by design (foundational dimension)	The extent to which a government leverages digital technologies to rethink and reengineer public processes, simplify or encapsulate procedures and create new channels of communication and engagement with public stakeholders for a more efficient, sustainable and citizen-driven public sector. A digital by design approach refers to deploying digital technologies from the start into governments' efforts to modernise service delivery and adopt strategic mechanisms to ensure their coherent design, implementation and monitoring, no matter the channel services are offered.

Data-driven public sector (foundational dimension)	The extent to which a government generates public value through the reuse of data in planning, delivering and monitoring public policies, and adopts ethical principles for trustworthy and safe reuse of data (OECD, 2019[7]). In a data-driven public sector, data are understood as enablers for designing policies and services. Data-driven governments ensure that public sector data are shared inside and/or outside the public sector in a trustworthy fashion, and under clear protection, privacy, security rules and ethical principles for national and public interest.
Government as a platform (foundational dimension)	The extent to which a government provides clear and transparent sources of guidelines, tools, data and software that equip teams to deliver user-driven, consistent, integrated and cross-sectoral service delivery standards (OECD, 2020[5]). Government as a platform approach calls for the deployment of a wide range of platforms, standards and services assisting teams to focus on user needs in public service design and delivery rather than on technological solutions.
Open by default (foundational dimension)	The extent to which a government unties technology and data within the limits of available legislation and in balance with public interest. An open by default approach describes the extent to which data, information, systems and processes are open unless there is a compelling reason for them not to be, helping build bridges between all actors in order to collect insights towards a more knowledge-based public sector (OECD, 2019[6]).
User-driven (transformational dimensions)	The extent to which a government becomes more user-driven by awarding to people a central role thus placing their needs at the core of the shaping of processes, services and policies; and the right inclusive mechanisms for this to happen are adopted (OECD, 2018[9]). Through engagement and collaborative mechanisms, policy processes, their outputs and outcomes are not just informed but shaped by the decisions, preferences and needs of citizens.
Proactiveness (transformational dimensions)	The extent to which a government has the ability to anticipate people's needs and to rapidly respond to them so they do not even notice that services are delivered. Proactiveness builds upon the five above-mentioned dimensions and aims at offering a seamless and convenient service delivery experience to citizens as governments are equipped to address problems from an end-to-end rather than fractioned approach.

Source: OECD Digital Government Policy Framework (OECD, 2020[5])

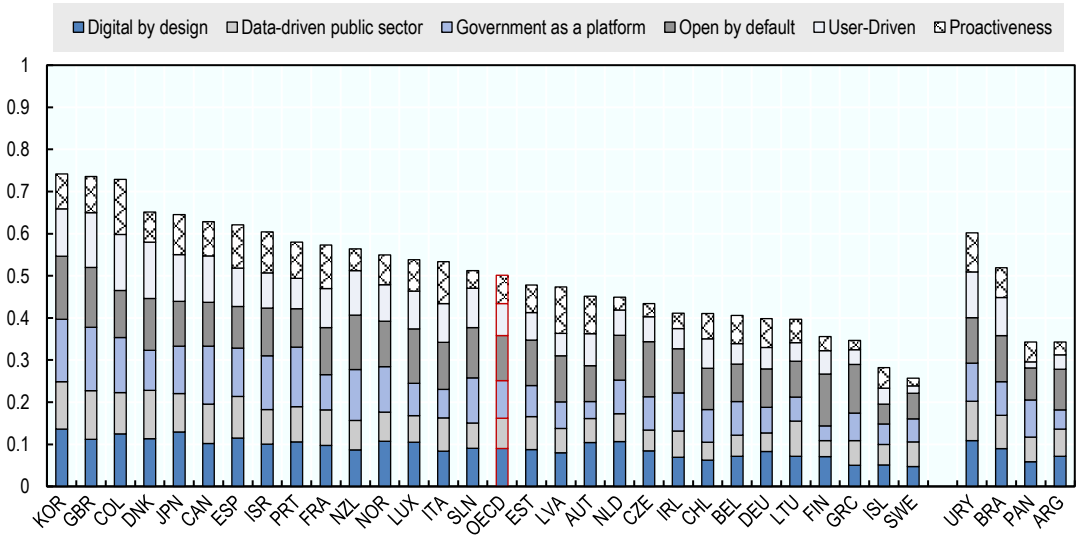
For advanced qualitative analysis, countries' digital government policies have been mapped across different stages of the policy cycle. Four transversal facets were identified to better assess each dimension and provide comparable ground between them. If analysed alone, these *Transversal facets* provide a deeper evaluation of policies' strengths and challenges across countries.

1. ***Strategic approach**:* to what extent governments have set a clear vision, objectives, goals and action in digital policy areas and how these are reflected into national digital government strategies (NDGS) or linked documents such as public sector data and open data policies, digital skills development strategies etc.
2. ***Policy levers**:* the specific tools used by governments to enable system-wide change and which serve to connect coherently countries' strategies with the implementation of digital government policies.
3. ***Implementation**:* the capacity of governments to transform policy goals and strategies into effective and concrete initiatives.
4. ***Monitoring**:* a set of activities to analyse and assess the development, implementation and/or impact of digital government policies.

Country scores

Composite results and overall scores per country are presented in Figure 4 and Table 7 respectively. Subsequent figures provide the detailed country scores on the overall index and on each dimension. It also provides the list of parameters included under each dimension, the number of items and Cronbach alpha scores.

Figure 4. The OECD Digital Government Index Composite Results



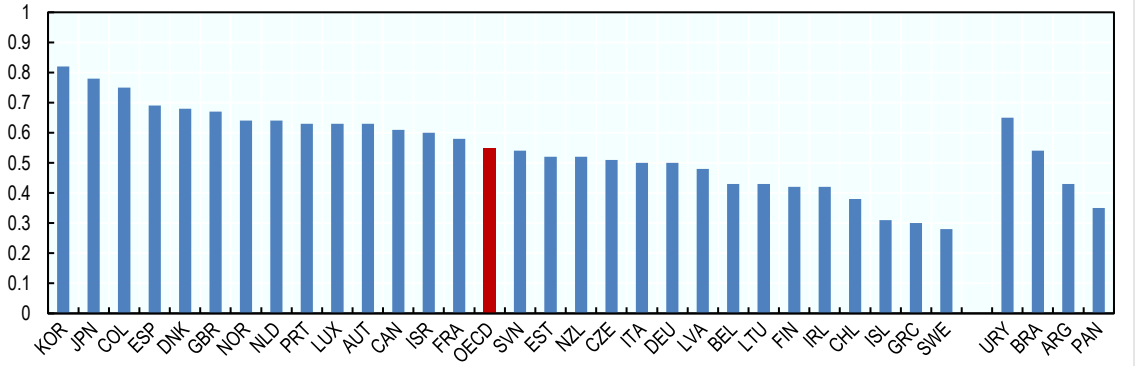
Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States of America.
Number of items: 210. Cronbach alpha: 0.964
Source: OECD Survey on Digital Government 1.0

Table 7. Detailed Results: Countries Scores and Rankings

	Digital by design		Data-driven Public Sector		Government as platform		Open by default		User-driven		Proactiveness		*Composite score*	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Korea	0.82	1	0.68	3	0.89	2	0.90	1	0.67	4	0.5	12	0.742	1
United Kingdom	0.67	6	0.69	1	0.9	1	0.85	2	0.78	3	0.51	11	0.736	2
Colombia	0.75	3	0.59	5	0.79	5	0.67	11	0.8	2	0.78	1	0.729	3
Denmark	0.68	5	0.69	2	0.57	12	0.74	6	0.8	1	0.43	15	0.652	4
Japan	0.78	2	0.55	8	0.68	9	0.64	19	0.67	5	0.57	7	0.645	5
Canada	0.61	13	0.56	7	0.82	4	0.63	21	0.66	6	0.49	13	0.629	6
Spain	0.69	4	0.6	4	0.69	8	0.59	23	0.55	12	0.62	4	0.621	7
Israel	0.6	14	0.49	12	0.77	6	0.68	10	0.5	16	0.58	6	0.604	8
Portugal	0.63	10	0.5	10	0.85	3	0.55	26	0.43	18	0.52	10	0.580	10
France	0.58	15	0.51	9	0.5	16	0.67	11	0.55	11	0.62	3	0.573	11
New Zealand	0.52	19	0.42	16	0.73	7	0.77	4	0.64	8	0.31	23	0.564	12
Norway	0.64	8	0.41	17	0.65	10	0.65	16	0.52	15	0.42	16	0.550	13
Luxembourg	0.63	11	0.38	20	0.46	21	0.77	4	0.54	14	0.45	14	0.538	14
Italy	0.5	21	0.47	13	0.4	24	0.67	11	0.55	10	0.6	5	0.534	15
Slovenia	0.54	16	0.36	22	0.64	11	0.72	8	0.56	9	0.25	26	0.513	17
OECD	**0.55**		**0.44**		**0.54**		**0.64**		**0.47**		**0.42**		**0.501**	
Estonia	0.52	18	0.47	15	0.44	23	0.65	16	0.39	20	0.39	20	0.478	18
Latvia	0.48	23	0.35	24	0.38	26	0.66	14	0.32	24	0.66	2	0.474	19
Austria	0.63	12	0.34	27	0.24	32	0.51	29	0.46	17	0.54	9	0.452	20
Netherlands	0.64	9	0.39	18	0.48	17	0.64	19	0.36	21	0.18	29	0.450	21
Czech Republic	0.51	20	0.29	29	0.48	19	0.78	3	0.36	22	0.18	29	0.434	22
Ireland	0.42	28	0.37	21	0.55	13	0.63	21	0.29	27	0.22	27	0.411	23
Chile	0.38	29	0.26	32	0.46	22	0.59	23	0.42	19	0.36	21	0.411	24
Belgium	0.43	24	0.3	28	0.48	20	0.53	28	0.29	26	0.4	19	0.406	25
Germany	0.5	22	0.27	31	0.37	27	0.55	26	0.31	25	0.41	18	0.398	26
Lithuania	0.43	25	0.5	11	0.34	28	0.51	29	0.26	28	0.34	22	0.397	27
Finland	0.42	27	0.23	33	0.21	33	0.74	6	0.33	23	0.2	28	0.356	28
Greece	0.3	32	0.35	26	0.39	25	0.69	9	0.21	30	0.13	32	0.347	29
Iceland	0.31	31	0.29	30	0.29	30	0.28	33	0.23	29	0.29	24	0.282	32
Sweden	0.28	33	0.35	23	0.33	29	0.36	32	0.1	32	0.11	33	0.257	33
Uruguay	0.65	7	0.56	6	0.54	14	0.6	6	0.65	7	0.55	8	0.602	9
Brazil	0.54	17	0.47	14	0.48	18	0.61	14	0.54	13	0.42	17	0.519	16
Panama	0.35	30	0.35	25	0.53	15	0.45	31	0.09	33	0.28	25	0.343	30
Argentina	0.43	26	0.39	19	0.28	31	0.58	25	0.2	31	0.18	31	0.342	31

Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Source: OECD Survey on Digital Government 1.0

Figure 5. Results in *Digital by design* dimension



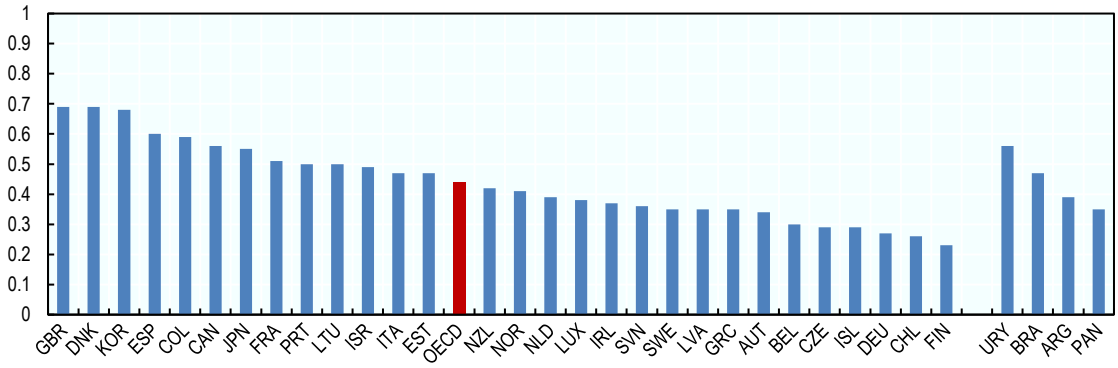
Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Number of items: 74. Cronbach alpha: 0.912
Source: OECD Survey on Digital Government 1.0

Digital by design – Detailed parameters:

- Existence of a National Digital Government Strategy (NDGS)
- Assessment to ensure that the implementation of digital government initiatives respect national norms/standards
- Digital by design and digital by default principles embedded in legislation
- Research on the national economic impact on businesses of the implementation of digital government services
- Government-wide consultations on the effect of digital tools/technologies for improving government services
- Public sector organisation responsible for leading and coordinating decisions on digital government, as well as advisory and decision-making responsibilities
- Formal coordination body/mechanism responsible for government ICT projects, as well as advisory and decision-making responsibilities
- Coordination between the NDGS and other national strategies in place
- Policy instruments in place to support the use of emerging technologies in the public sector
- Citizens' one-stop-shop portal available for central government services
- Measurement of transaction costs of delivering public services according to the different channels
- Enabling frameworks in place (e.g. common interoperability, base registries, shared ICT infrastructure and services, open source software, common data architecture/infrastructure)
- Digital identity systems
- Standards/guidelines for the design of digital services
- Measurement/estimation of the direct financial benefits and/or costs produced by ICT projects (ex-ante and ex-post)
- Measurement of non-financial benefits of public ICT projects
- Strategy, framework and formal requirements for digital skills, as well as mechanisms to forecast the needs for digital skills in the public sector
- The use of emerging technologies to improve ICT procurement processes

- Laws at the federal/central government level
- Mechanisms in place to assess the implications of new legislation on governments' digital needs
- Capacity building/training programmes in place to sensitise legislators and raise awareness of the implication of new legislation on the use of digital technology by the public sector

Figure 6. Results in *Data-driven public sector* dimension



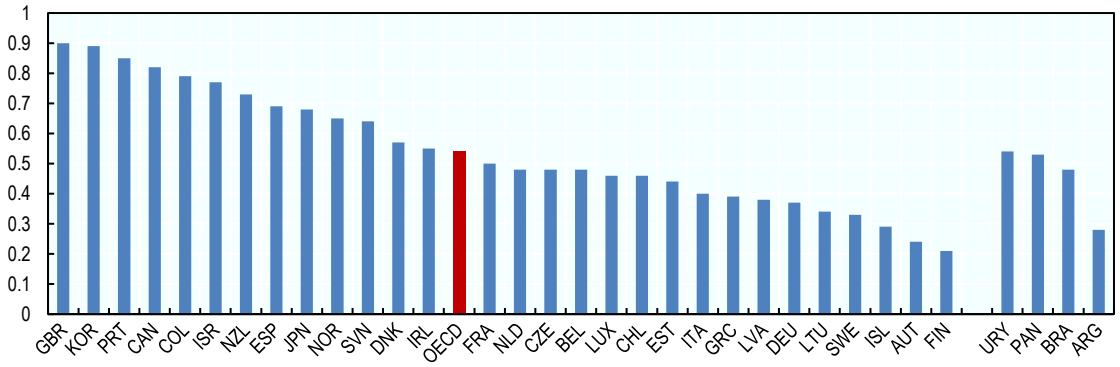
Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Number of items: 33. Cronbach alpha: 0.780
Source: OECD Survey on Digital Government 1.0

Data-driven public sector – Detailed parameters:

- Existence of a public sector data policy as well as its objectives (e.g. foresight for trends spotting and evidence-based policymaking; engagement of societal stakeholders; development of user-driven services; public sector productivity and efficiency; policy evaluation, monitoring and organisational learning)
- Policy initiatives to share and analyse data to boost public sector productivity and efficiency
- Policy initiatives to strengthen policy monitoring and evaluation through better data management and use
- Use of data collection and analysis to HRM programs and/or policies
- Single leading public sector organisation responsible for coordinating the implementation of the central/federal public sector data policy
- Formal requirement to assign institutional chief data officers for central/federal line ministries and central/federal agencies
- Formal requirement and chief data officers in place for central/federal government
- Formal requirements and fees for public sector to share data across different organisation
- Guidelines for data management and specific initiatives implemented in data gathering methods, sources, quality and relevance; data discoverability/inventories, sharing and interoperability; text and data mining (TDM) requirements for public sector organisations to (re)use data; communication/awareness initiatives aimed at managers, (senior) policy makers, back office and frontline civil servants; open data
- Standards and specific initiatives in data gathering methods, sources, quality and relevance; data discoverability/inventories, sharing and interoperability; text and data mining (TDM) requirements for public sector organisations to (re)use data; open data

- Formal requirements and the existence of a single data inventory for the central/federal government
- Strategy/policy and training sessions to develop skills among the public service workforce
- Formal requirements on data privacy and initiatives implemented to protect the privacy of citizens
- Formal requirements and initiatives implemented on the ethical management of data
- Formal requirements for once-only principle and right to have access to their data as well as consent or refuse data sharing from citizens and business
- Formal requirements and initiatives to provide transparency and openness of algorithms used for public decision-making
- Strategies and initiatives in place to manage security risks related to government data and information
- Key Performance Indicators (KPI) linked to the NDGS to monitor progress in its implementation

Figure 7. Results in *Government as a platform* dimension



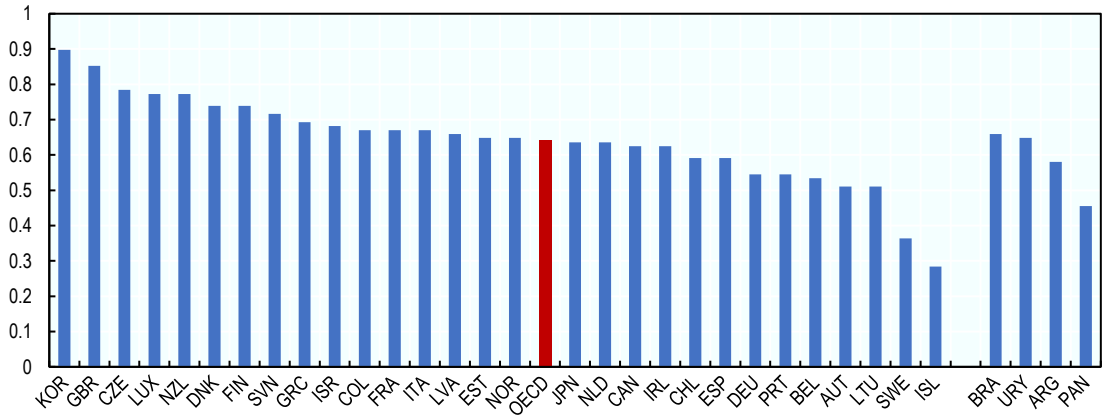
Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Number of items: 27. Cronbach alpha: 0.858
Source: OECD Survey on Digital Government 1.0

Government as a platform – Detailed parameters:

- Use of digital platforms (consultations; digitally-enabled decision making; opening up government data and fostering re-use) to proactively engage stakeholders external to the public sector in policy making and service delivery processes
- Stakeholders engagement (e.g. business, civil society, public servants, academic institutions, unions) when designing and co-designing digital government services
- Comprehensive assessment to understand the main barriers for co-designing services between businesses and government
- Platforms to engage the public and the private sector in discussing policy challenges and co-finding solutions
- Actions foreseen in the NDGS to the use of cloud computing
- Formal advisory/consultation body/ mechanism for government ICT projects foreseeing the participation of different actors
- Standardised model/method to develop and present business cases

- Standardised model for ICT project management
- Strategy and formal guidelines in ICT procurement
- Searchable repository to store ICT contracts

Figure 8. Results in *Open by default* dimension

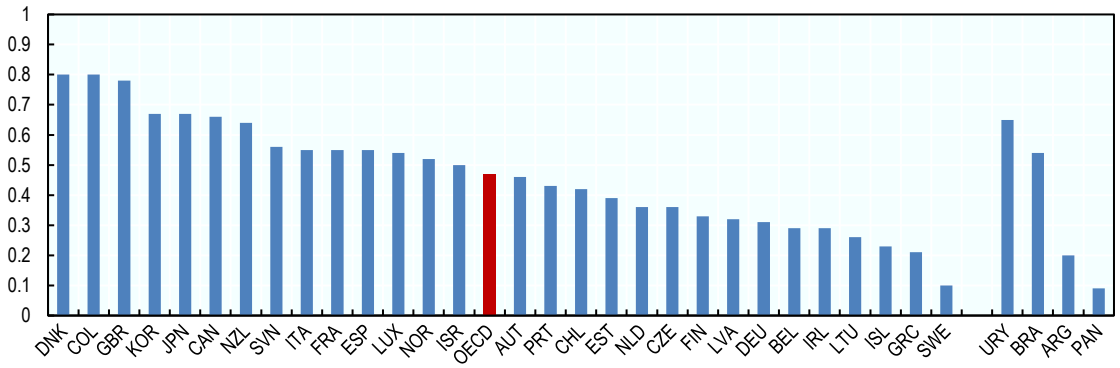


Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Number of items: 22. Cronbach alpha: 0.666
Source: OGD Survey on Digital Government 1.0

Open by default – Detailed parameters:

- Government-wide guidelines on the digital release of government data, policy design and decisions in a timely and comprehensible manner
- Medium-term strategy/action plan on open government data
- Formal requirements whereby government data should be "open by default"

Figure 9. Results in *User-driven* dimension



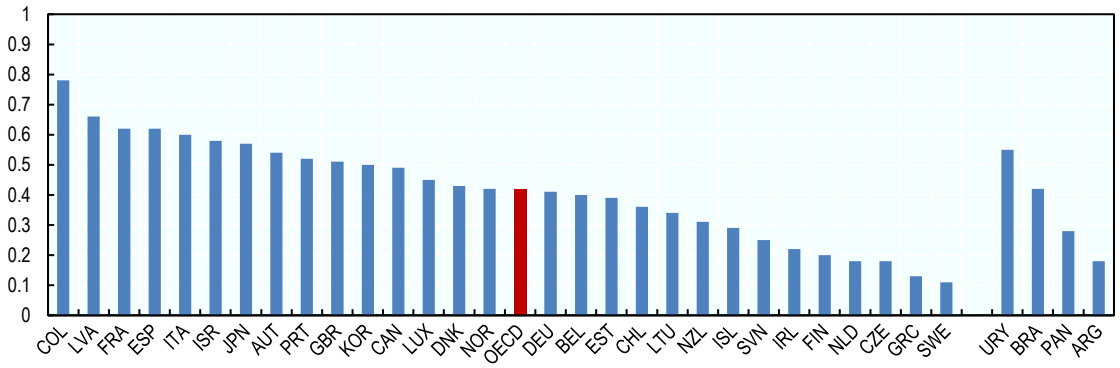
Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey and the United States.
Number of items: 33. Cronbach alpha: 0.900
Source: OECD Survey on Digital Government 1.0

User-driven – Detailed parameters:

- Inclusive, accountable and transparent mechanisms in the process of developing a government strategy or overarching policy
- Pillars of the NDGS or overarching policy on the inclusiveness of processes for the design of digital services; accessibility of digital services to all; proactiveness in service delivery; proactive request of feedback from service users on their experience with digital services
- Program or plan that aims to increase digital skills of citizens (e.g. different actions for different potentially vulnerable segments of the population or generic actions targeting all segments)
- Written guidelines regarding accessibility of digital government services to meet all users' preferences and engagement of final users in the early stages of service design
- Assessment and action plan to reduce the digital divide
- Formal requirements for central/federal line ministries/agencies to engage stakeholders using digital government tools to crowdsource ideas when services or policies are developed
- Efforts undertaken by central/federal government through the use of digital technologies to ensure inclusion and participation of vulnerable population groups (e.g. women; elderly; minorities; people with disabilities; citizens living abroad) in policy-making and service delivery processes
- Channels used at the central/federal level of government to engage actors to co-design digital government services (e.g. physical or virtual public meetings; proactive engagement of selected groups; advisory group/committee with actors from different communities; informal consultation with selected groups; ad hoc feedback transmissions)
- Online and offline channels to engage different actors when designing new digital services
- Public engagement foreseen in the NDGS to leverage mobile platforms to proactively engage citizens to gather their inputs to shape/design new services and/or policy; use data to foresee people's needs and interests; use online platforms to upskill citizens on digital opportunities
- Initiatives to adapt central/federal level public services according to the analysis of data on citizen needs, preferences and use patterns
- Formal guidelines and indicators to measure user satisfaction with digital government services

- Measure of financial benefits and costs produced by public ICT projects financed and implemented by the central/federal government for business, citizens and public sector
- Specific policy in place and approaches to test and evaluate digital projects/initiatives with the involvement of end-users
- Institutional mechanisms to promote the involvement of providers and stakeholders to test delivery modes of services

Figure 10. Results in Proactiveness dimension



Note: Data is not available for Australia, Hungary, Mexico, Poland, Slovakia, Switzerland, Turkey, and the United States.
Number of items: 21. Cronbach alpha: 0.791
Source: OECD Survey on Digital Government 1.0

Proactiveness – Detailed parameters:

- Means of informing the general public regarding existing opportunities to engage in the design of digital government services (e.g. official government publication - paper; government Websites; social media accounts - government accounts; traditional media; individual communications)
- Requirements to proactively engage experts outside the government at some stage of the policy cycle (e.g. identifying policy priorities; drafting policy documents; implementation; monitoring; evaluation)
- Elements to support effective public engagement in central/federal government service design and delivery using digital tools (e.g. written guidance on how to identify the actors to engage; formal requirements to engage users when designing a new service; to systematically inform the public in advance that a public consultation is planned to take place and to publish online the results of consultations; formal requirements regarding minimum periods for responding to government consultations)
- Training for public servants on the use of digital tools for engaging the public (e.g. social media, website design, data analytics, data mining, open government data)
- Communication strategy in place to inform citizens about the outcomes of the central digital strategy/initiatives
- Centrally available list with all fully transactional digital services provided in the public sector
- Formal requirements in place to enforce the “Once Only Principle” in service delivery
- Mechanism in place providing a comprehensive overview of on-going digital government initiatives (e.g. dashboard of ICT projects)

Key Findings

- The OECD has progressed in measuring the extent to which countries are transitioning towards an integrated and coherent development of digital governments. Both this paper and the survey measure this transition based on the OECD Recommendation of the Council on Digital Government Strategies. They represent an exploratory and pilot effort to assess the progress of digital government among OECD member and selected non-member countries across six dimensions: *Digital by design, Data-driven public sector, Government as a platform, Open by default, User-driven and Proactiveness.*
- The general results of the OECD 2019 Digital Government Index are promising yet modest: only a few countries are progressing towards digital governments. While most countries have set the political and technical institutional models for digital government reforms, limited efforts have been made to fully unlock the benefits of user-driven and data-driven public sectors.
- Korea, UK, Colombia, Denmark and Japan have made consistent and comprehensive efforts for the implementation of coherent digital government reforms with overall high performance in the six dimensions. Their outstanding performance derives from long-term institutional arrangements and sustainable strategies. The digital transformation and shift from e-government to digital government need to be sustained across years and enduring to changing political cycles.
- High-ranking countries excel predominantly given their high performance in Digital by design combined with outstanding results in User-driven and Data-driven dimensions. A good performance in Digital by design favours coherent governance and policies as a basis for a shift towards digital government. These countries also present high levels of engagement with users across policy cycles, favouring the design and development of policies and service delivery aligned with citizens' needs and expectations. Low-ranking countries perform on average with similar scores across in five out of six dimensions, with Open by default outstanding with the highest score.
- Digital government coordination units need to be embedded into the right institutional models to secure the necessary leadership, coordination, resources and legitimacy to transform high-level policies into actionable, concrete and coherent digitally-enabled public services.
- Strong strategies have paved the way for consistent and coherent policy implementation in top-performing countries. However, for average and lower-performing countries there is a significant gap between the development of digital government strategies and the implementation of concrete actions and levers to make digital government reform happen.
- Countries present better scores in *Open by default, Digital by design and Government as a platform* dimensions. This represents efforts towards establishing the right ecosystems for digital government, namely through strategies, shared tools, standards and management mechanisms.
- In contrast, the proactive involvement of users and stakeholders within digital government reforms lags behind. There is a risk that digital government efforts are not transformative enough if they are not consistently taking into account direct users' needs, expectations and preferences across the design, implementation, delivery and monitoring of digitally-enabled public services.

- *Open by default* outstands as the top scoring dimension, reflecting the political momentum for open data within digital government reforms. However, it contrasts with the low performance of countries in developing *Data-driven public sectors*. This poses a risk of developing open data policies as isolated and testimonial efforts that do not fully unlock the strategic value of data assets also for public sector organisations.
- Dedicated public sector data policies and leadership roles (such as Chief Data Officers) remain largely absent across countries' digital government initiatives. The lack of a strategic vision as well as formal roles and responsibilities for coherent design and implementation of data-driven public sector projects is a challenge to move from policies to concrete, sustainable and impactful actions.
- Governments should embed open data efforts within broader data-driven public sector reforms, ensuring the right and proactive governance, sharing and ethical principles towards opening up and using public data inside and outside governments for delivering public value and fostering citizens' wellbeing.
- Further efforts are needed to fully address the need for strong digital skills and reinforced culture for the success of digital government strategies. While countries declare data and digital skills as core components of their strategies, there are limited concrete and specific initiatives for comprehensive training and development of these skills across civil servants. The absence of trained and digital savvy civil servants can hamper the correct and coherent implementation of digital government policies.
- Although all low-performing countries can cite some strategy that sets policy goals, pillars and actions, poor adoption of formal mechanisms, guidelines, levers and platforms suggest the lack of means or actions to accomplish those objectives set in governments' strategies.
- In general, countries have demonstrated a slightly higher focus on strategic approach and implementation of digital government compared to the development of policy levers and monitoring mechanisms for digital transformation reforms. Countries might be missing an opportunity to leverage in equal ways these reforms across public sector organisations as well as to learn from experience to carry out more impactful and realistic digital government initiatives.

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