OECD Public Governance Policy Papers

2023 OECD Digital Government Index

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Results and Key Findings

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This paper was authorised for publication by Elsa Pilichowski, Director, Public Governance Directorate.

Abstract

Digital government is essential to transform government processes and services in ways that improve the responsiveness and reliability of the public sector. During the COVID 19 pandemic it also proved to be crucial to enable governments to continue operating in times of crisis and secure the timely provision of services to citizens and businesses. Yet solid foundations are needed for the digital transformation to be sustainable in the long-term. These include adaptable governance arrangements, reliable and resilient digital public infrastructure, and a prospective approach to govern with emerging technologies such as artificial intelligence. This paper presents the main findings of the 2023 edition of the OECD Digital Government Index (DGI), which benchmarks the efforts made by governments to establish the foundations necessary for a digital transformation of the public sector that is coherent and human-centred. It comprises 155 data points from 33 member countries, 4 accession countries and 1 partner country collected in 2022, covering the period between 01 January 2020 and 31 October 2022.

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This paper was written by Felipe González-Zapata, Seong Ju Park and Ricardo Zapata. Marco Beltrán Navarro contributed with data analysis, collection and validation. Minoru Omori, Arune Matelyte, Namo Salih, Hyewon Shin and Laura Uribe supported in data collection and validation. Alessandro Lupi performed the statistical validation. Cecilia Emilsson and Julian Olsen provided substantive comments. Andrea Uhrhammer and Claire Karle provided editorial assistance.

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The Digital Government Index project is based on the long-standing work of the OECD on digital government and government data. It has benefitted from the expertise of the OECD Working Party of Senior Digital Government Officials (E-Leaders) and its Task Force on Digital Government Indicators, with the participation of 14 member countries (Australia, Belgium, Canada, Colombia, Denmark, Finland, Italy, Japan, Korea, Latvia, Luxembourg, New Zealand, Spain, and the United Kingdom) and 2 partner countries (Brazil and Singapore).

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1 Introduction

Building quality foundations for the digital transformation of governments

The OECD Digital Government Index (DGI) assesses the efforts made by governments to establish the foundations necessary for a digital transformation of the public sector that is coherent and human-centred. Building on the pilot exercise conducted in 2020, the DGI serves as a resource for policymakers to support comprehensive policy reforms in the digital transformation of government to increase government productivity, enhance government services, and improve people's lives.

Governments are operating in a demanding and evolving digital environment. They face a range of pressing challenges from the rapid pace of technological advancements and uptake of emerging technologies, such as Artificial Intelligence, to rising citizens' expectations for seamless services.

Most governments intensified their efforts to digitalise the public sector during the COVID-19 pandemic, with the expectation that it would enhance their resilience and responsiveness. In this context, digital government emerged as a crucial means to guarantee continuity in the operations of the public sector and in the provision of essential government services.

However, in the aftermath of the pandemic, it has become clear that accelerating the digitalisation of the public sector does not automatically lead to better outcomes, and more transformative and sustainable changes. Looking to the future, the challenge is for governments to take a strategic approach to digital government that both builds on the progresses made during COVID-19 and seeks to deliver results in the long term. To increase the effectiveness and efficiency of the public sector, governments are required to become more flexible and future-oriented to capture the benefits of the digital transformation while mitigating its potential risks.

Achieving these outcomes requires a transformation to enable greater interoperability, integration and collaboration, within and across sectoral boundaries and levels of government, as well as beyond national borders. Digital government can be a powerful driver of such transformation. Yet, for this to happen it needs to be underpinned by the right foundations.

Solid foundations for a sustainable and long-term digital transformation of the public sector include setting up governance arrangements that can adapt to a rapidly changing digital environment. This governance should be grounded on a strategy for digital government that sets a common vision and objectives for the whole-of-government and provides the capabilities to deliver quality public services.

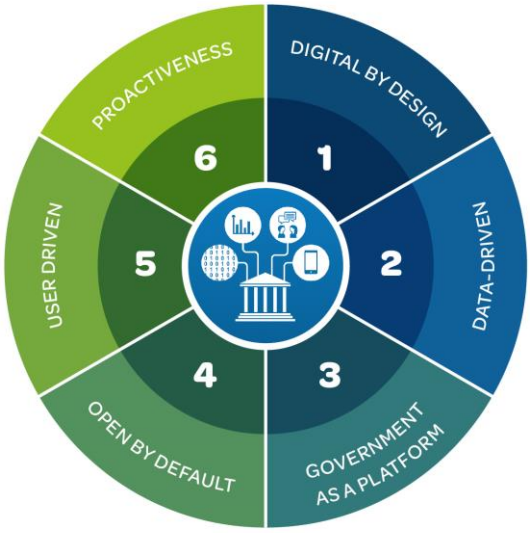
These foundations should also include a reliable and resilient digital public infrastructure, encompassing digital identity, digital payments, digital post, data sharing systems, among others. Many governments have developed these systems and tools under their '*Government as a Platform*' approach. They are essential to enable a coherent digital transformation at scale, to promote a responsible use of government data, and to facilitate inclusive access to services.

The OECD Digital Government Index (DGI)

The DGI assesses countries' digital government by looking at the degree to which they have the necessary foundations in place to be able to leverage data and technology to deliver a whole-of-government and human-centric digital transformation of the public sector. These foundations are identified in the provisions of the OECD Recommendation of the Council on Digital Government Strategies (OECD, 2014[1]) and the six dimensions of the OECD Digital Government Policy Framework (see Figure 1).

It is important to note that the DGI does not measure the level of digitalisation of specific government processes and services, nor the uptake of these services by the users, which is measured by other international benchmarks.

Figure 1. The six dimensions of the OECD Digital Government Index



Source: OECD (2020[2]), *The OECD Digital Government Policy Framework*, https://doi.org/10.1787/f64fed2a-en

The DGI assesses digital government maturity along the six dimensions in Figure 1, namely:

- **Dimension 1 - Digital by design:** measures how digital government policies are designed to enable the public sector to use digital tools and data in a coherent way when formulating policies or transforming public services.
- **Dimension 2 - Data-driven:** measures government's advancements in developing the governance and enablers needed for data access, sharing and re-use across the public sector.
- **Dimension 3 – Government as a platform:** measures the deployment of common building blocks such as guidelines, tools, data, digital identity and software to equip teams to advance a coherent transformation of government processes and services across the public sector.
- **Dimension 4 - Open by default:** measures openness beyond the release of open data, including efforts to foster the use of technologies and data to communicate and engage with different actors.
- **Dimension 5 - User-driven:** measures governments' capacity to place user needs at the core of the design and delivery of public policies and services.
- **Dimension 6 - Proactiveness:** measures governments' capacity to anticipate the needs of users and service providers to deliver government services proactively.

The DGI assessment focuses on both the strategic and operational levels. For each dimension, the Index looks at four *transversal facets* representing the policy cycle. Therefore, for each dimension the DGI assesses the:

- **Strategic approach**, i.e., overarching strategies, policy frameworks and goals for digital government.
- **Policy levers**, i.e., resources and tools to enable the implementation of the strategic approach.
- **Implementation**, i.e., practices to execute the strategic approach into a concrete action.
- **Monitoring**, i.e., resources and tools to track progress or evaluate the implementation.

The 2023 Digital Government Index

The 2023 OECD DGI builds on the lessons derived from the pilot measurement released in 2020. In accordance with the rules of the OECD, the DGI methodology and results have been validated by the Working Party of Senior Digital Government Officials (E-Leaders). The 2023 DGI integrates the insights gathered through the extensive interactions with the E-Leaders' Task Force on Digital Government Indicators during 2021 to capture the priorities and observations expressed by member countries to the pilot edition (see the Methodological note). This process led to the preparation of the OECD Survey on Digital Government 2.0 which informs the calculation of the 2023 edition. 33 member countries, 4 accession countries and 1 partner country participated in the 2023 edition of the DGI.

While the methodology remains the same, the 2023 Digital Government Index results cannot be compared directly overall and at the level of each dimension to the previous pilot edition. This is due to changes made to the survey.

In addition, the 2023 DGI Survey included questions on **emerging policy areas** prioritised by governments in their national digital government agenda. These include digital public infrastructure (e.g., digital identity), the use of artificial intelligence in the public sector, and strategic partnerships with the private sector, including GovTech. The rationale is that governments' ability in handling these emerging priorities have an impact on progresses across the six dimensions (e.g., progresses in the use of AI in the public sector can help advance country's performance in the dimensions *Proactiveness* and *Open by default*). Thus, the expanded scope of the survey's questions aims to support governments in future-proofing their digital government strategies.

Key findings

Overall DGI results

- **The best performing countries in the 2023 Digital Government Index are Korea, Denmark, United Kingdom, Norway, Australia, Estonia, Colombia, Ireland, France and Canada.** These countries demonstrate a comprehensive approach to ensuring strong foundations for digital government with a balanced performance across the six dimensions of the Index.
- **OECD countries perform better in establishing the foundations for a digital- and data-enabled government – i.e., higher average scores are in *Digital by design, Data-driven Public Sector* and *Government as a Platform* dimensions.** These results reflect efforts to strengthen digital government foundations in response to the COVID-19 pandemic, including the need to deploy and scale up digital public infrastructure (e.g., digital identity, data sharing, digital service platforms and apps) to support the access to government services through digital channels.
- **When looking at the policy cycle, OECD countries attain better overall results in adopting a *strategic approach* to digital government consistently across the six dimensions.** In contrast, *monitoring* efforts present the lowest results. This performance shows the need to take concrete actions to focus on effective implementation of digital government policies, to ensure goals are achieved and stakeholders remain accountable.

DGI results by dimensions

- **Countries have made significant progress in strengthening the governance of digital government. Yet, governments need to enhance the mandate and oversight mechanisms of the entrusted governance arrangements to yield greater impact.** Results for the *Digital by Design* dimension show that all countries have in place policy instruments and dedicated institutional setups to steer digital government. However, further efforts are needed to award a clear political mandate and leadership role to the governance arrangements and to establish robust monitoring and accountability mechanisms.
- **Advancing data governance in the public sector has become a top priority for most countries to ensure the use of data as a strategic asset.** According to results for the *Data-driven Public Sector* dimension, about two-thirds of countries have in place dedicated leadership roles, governance arrangements and strategic instruments for data. These are important to help ensure the impact and effectiveness of data policies (for example, data interoperability).
- **OECD countries should prioritise the adoption of mechanisms for enhanced data access and sharing in the public sector.** Most countries have data sharing arrangements for the public sector in place, e.g., interoperability systems, but only slightly more than half of public sector institutions make effective use of them across central/federal and sub-national government levels.
- **Further efforts are needed by countries to establish robust digital public infrastructure that supports seamless, proactive, and inclusive services in the digital age.** Results for the *Government as a Platform* dimension indicate that despite the high adoption of digital identity and data sharing systems, other key enabling digital public infrastructure such as common digital post, notification and payment solutions are not widely available across OECD countries.
- **While digital identity solutions for accessing public services are available in most countries, further actions are needed to enable cross-sector use.** While uptake of digital identity systems

is high, supporting governance arrangements (including leadership and mandate for digital identity at national level) can be reinforced for users and service providers to effectively leverage its benefits across sectors.

- **Comprehensive governance mechanisms to efficiently manage investments and spending on digital government are not widely available across OECD countries.** With the accelerated digital transition, governments are increasingly investing financial resources in digital government. In general, governments have dedicated mechanisms to gauge the value proposition of digital investments and assess their merits against government priorities. However, evidence in the *Government as a platform* dimension shows that current efforts are not yet enabling an integrated and strategic management of digital investments, from planning to implementation and monitoring. Only 15% of OECD countries have a comprehensive investment framework in place for all investments or those that meet certain conditions.
- **Despite positive strides in fostering a culture of openness, countries need to develop further the necessary policy levers and monitoring mechanism to ensure enduring progress.** Results in the *Open by default* dimension shows that governments are not prioritising key tools that promote openness in the use of digital technologies, nor in data in the public sector (in line with the results of the 2023 OURdata Index). For instance, only 15.8% of countries currently have a policy instrument to assist public institutions in explaining why and how they use algorithms. This also includes the limited adoption of guidelines for the use of open-source solutions and collaboration mechanisms within digital ecosystems to reinforce the culture of openness and transparency.
- **Ensuring that services meet users' needs and expectations remains a primary objective for governments, but these are not always reflected in concrete practices.** Results for the *User-driven* dimension show that governments need to strengthen both soft and hard policy levers to implement the user-driven approach in practice. Less than 50% have formal requirements or government-wide initiatives to employ digital government tools to engage citizens and businesses in co-designing services. Additionally, only 29% of countries mandate user testing for digital government services.
- **Most countries are strongly committed to reducing the digital divide.** Over 90% have implemented an action plan aimed at tackling digital divides, 80% of which have also put in place enablers including a legal and regulatory framework, funding mechanisms, and public communications to support the implementation of the action plan.
- **Countries have made considerable progress in establishing strategic approaches for the use of AI in the public sector and in adopting non-binding instruments for its responsible and ethical deployment.** However, results for the *Proactiveness* dimension suggest that governments could make better use of AI to improve government efficiency, effectiveness and responsiveness by better aligning implementation efforts with the relevant policy tools. This includes strengthening core digital infrastructure, investing in skills development, refining effective procurement rules, setting standards, enhancing oversight mechanisms and impact assessment tools and building partnerships.
- **Countries can use data more effectively to anticipate user needs and provide proactive services.** Results of the *Proactiveness* dimension indicate that countries lie in the mid-range of the maturity scale when assessing government-wide initiatives using data to anticipate or plan government interventions (score of 0.5 out of 1). Differences exist between countries with 45% having high levels of maturity (above 0.7) and 50% displaying low levels of maturity (below 0.3).

Emerging policy areas

- **Some countries have introduced various initiatives to improve their capacity to use AI in the public sector, yet implementation remains a challenge in most countries.** 66% of countries have used AI to enhance internal processes, while only 32% have used it to improve policies.
- **Aligning the green transition with digital government is an emerging priority for most governments.** Results across dimensions indicate that while governments recognise the critical need for digital government to contribute to the green transition, relevant policies and practices are still limited across countries, and not fully aligned with existing strategic instruments such as NDGS.

2 Overall results and key findings

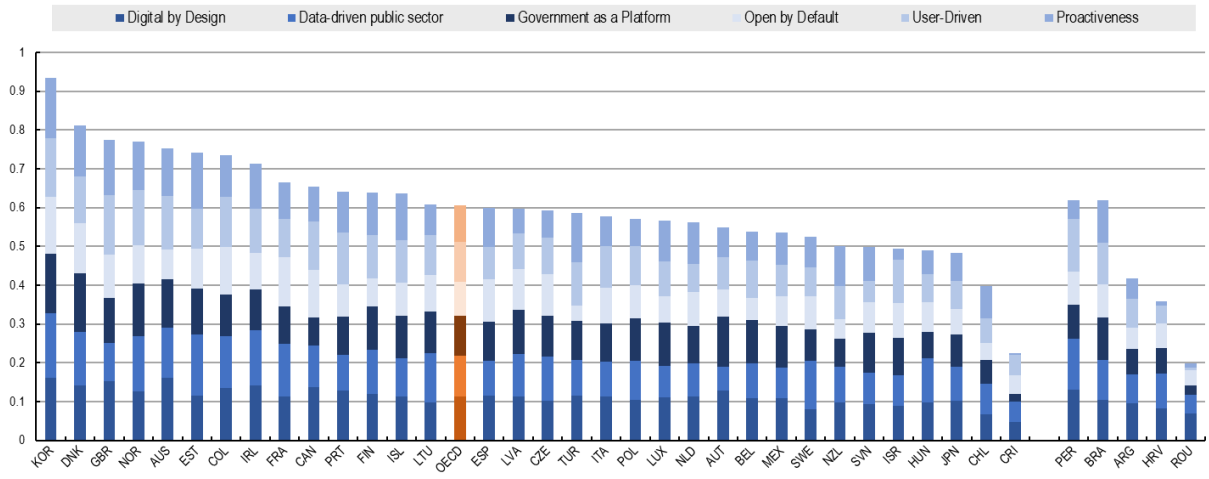
Key findings on the 2023 DGI overall results

The 2023 edition of the Digital Government Index assesses countries' digital government by looking at the degree to which they have the necessary foundations in place to be able to leverage data and technology to deliver a whole-of-government and human-centric digital transformation of the public sector during the period between 1 January 2020 to 31 October 2022.

The overall results of the DGI reflect the developments made by governments to advance the digitalisation of the public sector during the assessment period. Nearly all governments scored above the 0.5 mark, situating themselves in the upper half of the Index, with an OECD average of 0.605 (see Figure 2). This implies that, on a scale from 0 to 1, where 1 indicates the highest level of efforts in establishing the enabling foundations for a digital transformation of the public sector that is coherent and human-centred, most countries are closer to this level than away from it.

The top 10 performers in the 2023 Digital Government Index are Korea, Denmark, United Kingdom, Norway, Australia, Estonia, Colombia, Ireland, France and Canada. The balanced performance of these countries across the six dimensions reflects their comprehensive efforts in the implementation of digital government policies.

Figure 2. OECD 2023 Digital Government Index, composite results by country



Note: The data collection period for this edition of the DGI is from 1 January 2020 to 31 October 2022. Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

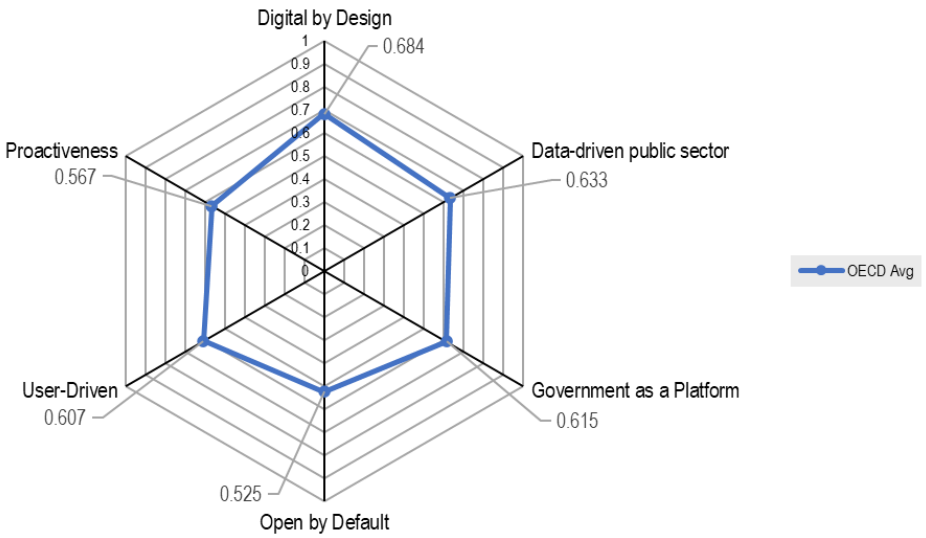
Table 1 and Figure 3 highlight key statistics and the OECD average across the six dimensions. Countries perform better in *Digital by design, Data-driven public sector* and *Government as a platform* dimensions. The efforts deployed during the COVID-19 pandemic to strengthen digital government foundations to respond to the emergency can help explain this performance. These efforts have included e.g., increased investments to deploy and scale-up digital public infrastructure (e.g., digital identity, data sharing, digital service platforms and apps) and as well as to increase the number of digital services. In contrast, countries show a lower performance in the dimensions *User-driven, Proactiveness* and *Open by default*. On one hand, these results may reflect some of the challenging trends observed during this period, such as the limited progress of open data efforts, as observed in the results of the OURdata Index (OECD, forthcoming[3]). On the other hand, they may be indicative of how the rapid digitalisation of government services to respond to the extended lockdown is not indicative of an increased capacity to understand user needs to maximise impact and solve end problems. Full composite and dimension results by country are presented in Table A.1.

Table 1.Summary statistics for the DGI results

Dimension	Dimension 1 – Digital by design	Dimension 2 – Data-driven public sector	Dimension 3 – Government as a platform	Dimension 4 – Open by default	Dimension 5 – User-driven	Dimension 6 – Proactiveness
OECD average	0.684	0.633	0.615	0.525	0.607	0.567
Maximum value	0.973	1.000	0.913	0.882	0.925	0.934
Minimum value	0.283	0.317	0.118	0.235	0.321	0.019
Standard deviation	0.144	0.161	0.149	0.154	0.157	0.189

Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Figure 3. The six dimensions of the DGI, OECD average



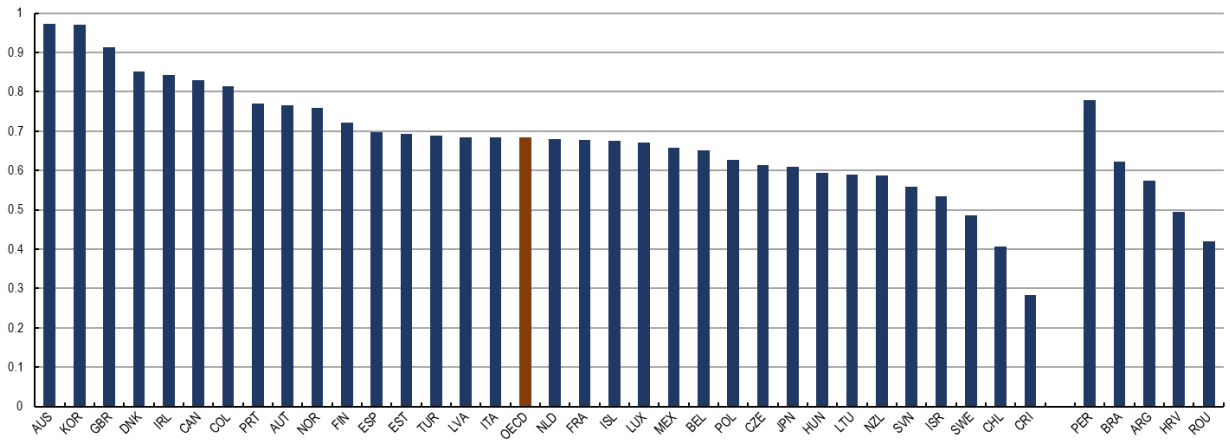
Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States is not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Key findings across countries on Dimension 1 – Digital by design

The dimension *Digital by design* measures efforts to institutionalise digital government in the machinery of government in ways that enable public sector institutions to use digital tools and data in a coherent and strategic manner to transform processes and services. Specific themes assessed under this dimension include the governance of digital government (strategy, institutional arrangements, co-ordination bodies, mandate and formal responsibilities of the institution in charge of digital government) and its interplay with key foundations such as digital public infrastructure, digital government investments, digital talent in the public sector, and service design and delivery.

Figure 4 presents the aggregated results for the dimension *Digital by design*, which attained the highest performance among the six dimensions with an average of 0.684. This result can be attributed to sustained efforts from governments to reinforce the foundations of digital government, especially designing and adopting strategies and setting the adequate institutional structures for their implementation. The top-ten performers in this dimension are Australia, Korea, United Kingdom, Denmark, Ireland, Canada, Colombia, Portugal, Austria, and Norway.

Figure 4. Digital by design, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States is not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 2. Digital by design, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	***Digital by design***
73%	71%	69%	53%	**68%**

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

The specific results for *Digital by design* show that all governments (including accession countries) have adopted national digital government strategies (NDGS) under the steering of a central/federal authority for digital government. However, governments need to intensify their efforts to better monitor the implementation of their NDGS to achieve their intended outcomes and provide greater accountability for results (see Table 2, *Monitoring* transversal facet). Despite 80% of countries having monitoring systems to

track initiatives included in the NDGS, only 40% evaluate the impact and outcomes of their investments in digital government.

With all countries having a central/federal organisation in charge of steering digital government, results are less promising when looking at their mandate and responsibilities. OECD countries show mid-level maturity (67%) regarding the degree of entrusted authority and responsibility allocated to the central/federal leading digital government institution, including in terms of their ability to make binding decisions over digital investments and priority initiatives.

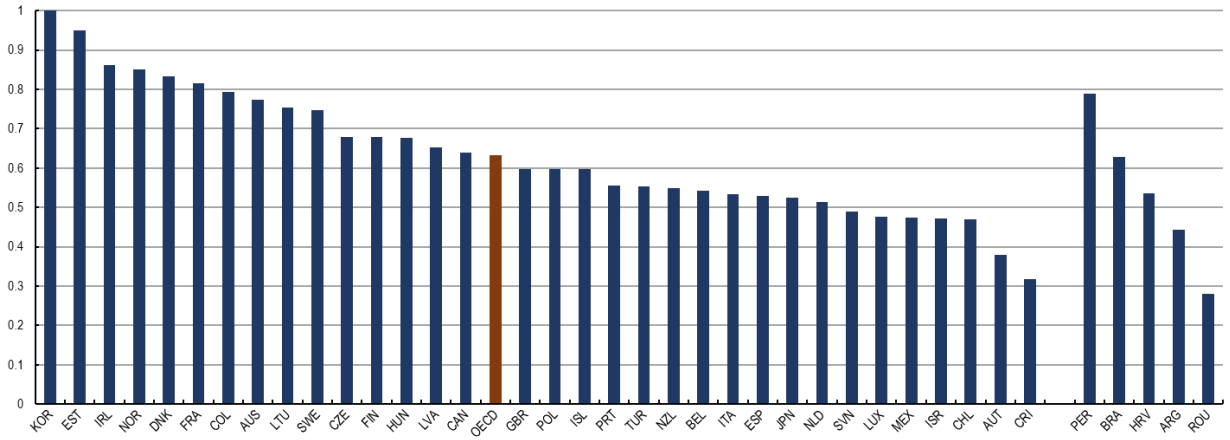
The performance of countries falls relatively short in terms of structured mechanisms to engage with diverse actors from within and outside the public sector to inform policy decisions on digital government. Supporting co-ordination bodies (e.g., council of CIOs or similar function) are widely available across OECD countries (91%). In contrast, only 33% of governments have a formal external (non-governmental) advisory or consultation body dedicated to digital government that facilitates engagement with the private sector, technology experts, or broader civil society. In both cases, the primary role of these bodies is mostly to share knowledge on the latest developments in the policy area, rather than playing a more substantive role in decision-making.

Key findings across countries on Dimension 2 – Data-driven public sector

The dimension *Data-driven public sector* measures government's advancements in developing the foundations needed to facilitate data access and sharing across the public sector. Aspects measured in this dimension include governance, such as the existence of dedicated leadership roles, institutional arrangements and a strategy for data; data sharing mechanisms, including data standards, interoperability and inventories; as well as provisions for data protection, data rights and data ethics.

Data-driven public sector is the second-best performing dimension, with an OECD average of 0.633 (see Figure 5). This good performance is also reflected in the results for the transversal facets (see Table 3), with countries scoring well in *strategic approach, policy levers*, and *implementation*. In contrast, countries score lower when considering the *monitoring* mechanisms in place to secure coherent results across the administration.

Figure 5. Data-driven public sector dimension, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 3. Data-driven public sector, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	*Data-driven public sector*
71%	62%	65%	44%	63%

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

The top-ten performers in this dimension are Korea, Estonia, Ireland, Norway, Denmark, France, Colombia, Australia, Lithuania, and Sweden. In all these countries, the management and use of government data is a strategic priority, reflected in comprehensive efforts to strengthen data governance in the public sector and enhance data access and sharing.

While there have been many positive developments in this area, data governance maturity is still uneven across OECD countries. *Data-driven public sector* is one of the dimensions with the highest standard deviation, reflecting a large gap between high and low performers. More countries could enhance data leadership to fully harness data as a strategic asset across government, to complement the considerable efforts undertaken to establish data protection regimes and authorities. Only 59% of OECD countries have a data strategy or similar instrument in place for the public sector, and 67% of countries have a dedicated role to steer the public sector data agenda. The absence of governance mechanisms for a data-driven public sector may reduce the impact and effectiveness of implementation (e.g., on data interoperability). In contrast, 94% of OECD countries have a dedicated authority to oversee data protection.

Countries are paying special attention to data management in the public sector and are establishing concrete mechanisms to achieve this goal. For example, 67% of OECD countries have a technical standard or recommendation that sets minimum criteria for assessing data quality across the public sector. Countries are also prioritising the availability of standards or guidelines to support metadata management (71%), data inventories (70%), data access and sharing (73%), and, to a lesser extent, data quality assessment (52%) and data anonymisation (55%).

Data sharing in the public sector remains a priority for OECD countries, but further actions are needed for public sector institutions to realise data's full potential. 83% of OECD countries have in place a data interoperability system to enable sharing of data across the public sector. However, uptake is still limited – for countries with this system in place, on average only 56% of public sector institutions use this system to share data, while only 53% does it at sub-national level. Identity information (88%), residence (84%) and civil status (81%) data are mostly shared through the interoperability system, and to a lesser extent economic and tax (71%) and health (56%) data.

Key findings across countries on Dimension 3 – Government as a platform

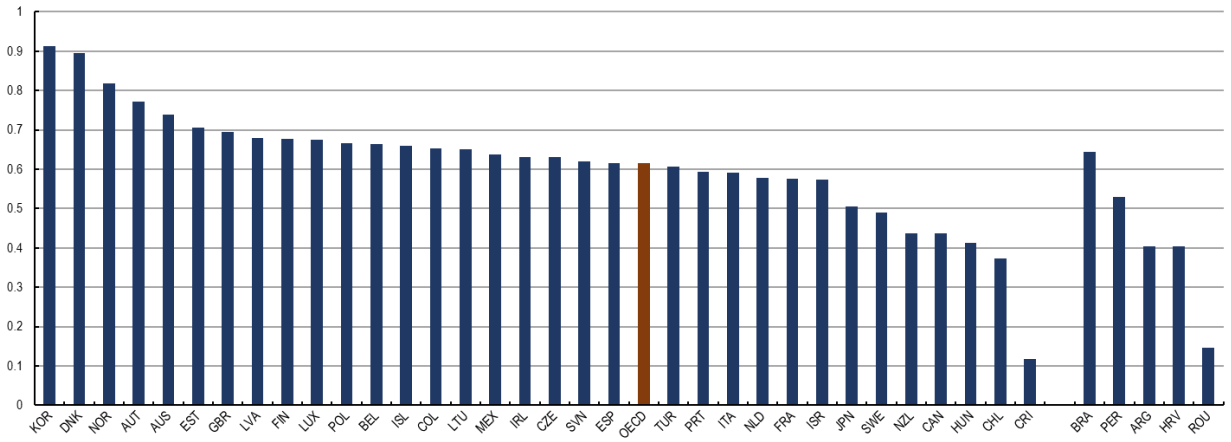
The dimension *Government as a platform* measures the availability of common building blocks such as guidelines, tools, data, infrastructure, and software to equip public sector teams to deliver and secure coherent processes and services across the public sector. Aspects assessed in this dimension include digital public infrastructure, including digital identity, service platforms and apps, digital notifications, digital payments, and cloud infrastructure; common standards for service design and delivery, project management (including agile), and value proposition of investments; as well as common implementation tools such as approval mechanisms for digital investments, ICT procurement, and GovTech.

Government as a platform performs in third place in the DGI, with an OECD average score of 0.615 (see Figure 6). The top-ten performers in this dimension are Korea, Denmark, Norway, Austria, Australia, Estonia, United Kingdom, Latvia, Finland, and Luxembourg. This dimension presents the second-lowest

standard deviation in the Index, reflecting that developments across countries are more even between top and bottom performers compared to the other dimensions under assessment.

In terms of results by transversal facets, the strategic approach to *Government as a platform* excels compared to the other three facets of the policy cycle within this dimension (see Table 4). Notably, governments are setting strategic instruments to steer the implementation of digital public infrastructure, including digital identity, as well as to guide initiatives on cloud infrastructure in the public sector.

Figure 6. Government as a platform dimension, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 4. Government as a platform, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	*Government as a platform* average
70%	58%	60%	56%	62%

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

Digital public infrastructure is covered in most OECD countries' digital government strategies, nonetheless with uneven implementation. For example, while digital identity systems are widespread across countries, on average only 55% of OECD countries enable access to 75% or more public services through a digital identity solution. Dedicated responsibilities to oversee the adoption of digital identity in the public sector is a common practice (present in 90% of countries). However, similar responsibilities to steer the use of digital identity to access private services are less predominant (present in 68% of countries). Notably, the role of the European Union and the eIDAS Framework play a key role in advancing the level of maturity observed across EU countries.

In contrast, other elements of digital public infrastructure – such as common digital notifications, digital post and digital payment solutions – are not widely available, with slightly more than half of countries with these in place (59% across OECD countries).

Within the digital public infrastructure landscape, cloud technologies are gaining traction in national digital government strategies. More than half of countries have cloud initiatives in place for more convenient and

scalable access to common digital resources, including storage and computing (IaaS), platform as a service (PaaS), and software as a service (SaaS). Access to cloud technologies relies on both public and private solutions (48% vs 52% respectively), with a growing attention from top-performing countries to leverage private sector solutions.

As the digital transition accelerates, governments are increasing financial resources for digital government. Ensuring better digital spending requires getting the governance of digital investments right. Common mechanisms to gauge the value proposition (e.g., business cases) have largely been adopted at central or federal levels of government for cost-benefit analysis and approval of either all investments, or at least selected investments that meet certain conditions (88% of countries). However, these mechanisms are not often integrated into a portfolio approach that would enable a more effective oversight of digital investments. The absence of such an integrated approach restricts the capacity of digital government authorities to better understand and respond to the digital needs of the public sector, including timely management and mitigation of risks associated to legacy technologies. Only Australia, New Zealand, France, Ireland and Denmark having such an integrated approach in place for all investments or those that meet certain conditions.

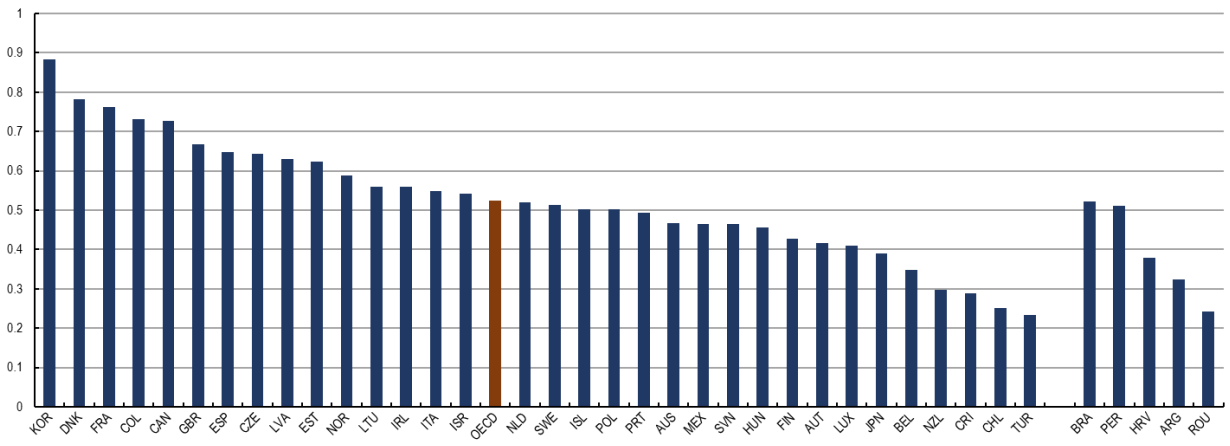
Key findings across countries on Dimension 4 – Open by default

Open by default measures openness, beyond the release of open data, including efforts to foster the use of technologies and data to communicate and engage with different actors. A low performance in the *Open by default* dimension underscores the need for governments to promote a culture of openness by fostering the use of technologies and data to communicate and engage with different actors, as well as ensuring access, availability and re-use of open government data. This dimension evaluates enablers for use and management of open government data aligned with a dedicated open data strategy, as well as a publicly available central catalogue of government services. It also assesses the policies and initiatives that promote digital rights of citizens, openness and transparency across all policy areas and the development of digital public infrastructure such as digital identity systems. Strengthening efforts to develop open-source policies, ensure algorithmic transparency, and deploy digital public infrastructure in ways that are fair and open would also be important to progress on this dimension and support digital inclusion.

Figure 7 shows the aggregated results for the *Open by default* dimension, which attained the lowest performance among the six dimensions with an average of 0.525. On the positive side, most countries have formal requirements to ensure that public institutions make government data open and available. Countries also demonstrate robust efforts in taking a strategic approach to enhance the culture of openness across the public sector. Nevertheless, there is significant room for improvement to monitor the implementation of these efforts (Table 5).

The top ten performers in this dimension are Korea, Denmark, France, Colombia, Canada, the United Kingdom, Spain, Czechia, Latvia, and Estonia. These countries demonstrate a stronger strategic approach and more effective policy levers to manage and use open government data. For instance, all of them have enacted legislation mandating public sector institutions to make data available and have implemented mid-term strategies or action plans for open government data. Additionally, they created a service catalogue accessible to users and implemented a policy to encourage the adoption of open-source software across the government.

Figure 7. Open by default dimension, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 5. Open by default dimension, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	*Open by default* Average
71%	53%	53%	39%	53%

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

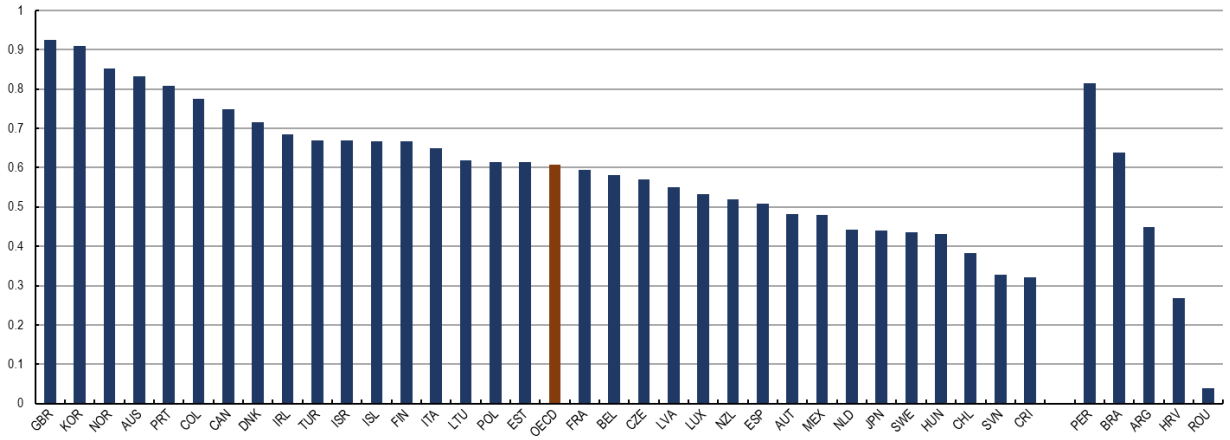
Nevertheless, all countries struggle to fully embrace the *Open by default* dimension. Countries would benefit from the development of policy levers, including formal requirements for open government data, and stronger monitoring mechanisms to achieve greater and enduring progress. A comprehensive public sector data inventory is also essential for the efficient management and effective use of public sector data. Impact assessments and evaluations are equally important tools to measure the effectiveness and value of open data initiatives and it appears that most countries should increase their efforts in conducting impact assessments and evaluations. The establishment of clear guidelines for using open-source solutions and fostering collaboration within digital ecosystems could further enhance transparency. Finally, as the use of AI expands in the public sector, fostering greater algorithmic transparency will be paramount to ensure the responsible use of AI. Only 15.8% of countries have a policy instrument (e.g., law, standards, guidelines) to support public institutions in explaining how and why they use algorithmic tools.

Key findings across countries on Dimension 5 – User-driven

The fourth performing dimension is *User-driven* with an average 0.607 (Figure 8). This dimension assesses governments' capacity to centre the design and delivery of policies and services around user needs. It specifically examines a coherent approach to involving users in policy making and service design, as well as strategic measures taken to address the digital divide. Countries exhibit a strong commitment to reduce the digital divide. More than 90% of countries have an action plan to address the issue, among which 80% have enablers (e.g., legal and regulatory framework, funding mechanisms, public communications) in place to support the implementation of the action plan.

Furthermore, most countries have set clear operational goals to ensure that users benefit from digital services, including by increasing the provision of personalised proactive services that reduce unnecessary interactions and frictions with government institutions. With this strategic approach, governments have proactively engaged various actors in designing government services to ensure user needs are reflected. Regarding the transversal facets, the strategic approach is the most robust, while the other three show moderate performance, as with the other five dimensions (Table 6).

Figure 8. User-driven dimension, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 6. User-driven dimension, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	*User-driven* Average
78%	53%	60%	55%	61%

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

The top ten performing countries are the United Kingdom, Korea, Norway, Australia, Portugal, Colombia, Canada, Denmark Ireland, and Türkiye. They have all developed whole-of-government standards or guidelines for service design, with fundamental principles, such as *understanding user needs and expectations*, and *involving users in the design and delivery of services.*

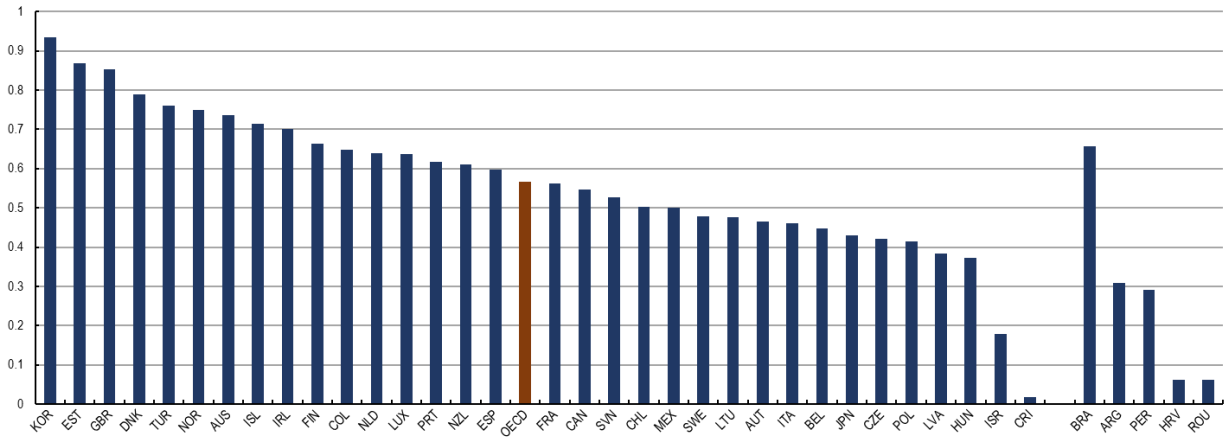
Although most countries recognise the significance of engaging users in the design of public services, reinforcing both soft and hard policy levers would help countries be more user-driven in practice. For instance, less than 50% of countries have formal requirements or government-wide initiatives to use digital government tools to engage citizens and businesses in generating ideas and co-creating services. Moreover, only 29% of countries require testing digital government services with users.

Finally, countries need to better evaluate the extent to which public services meet user needs and therefore deliver services that are people-centred. They should also proactively monitor the experience of users with public services. Only 55% of countries assess whether digital government services address use needs throughout the service design and delivery cycle. The lack of monitoring efforts makes it challenging for countries to deliver more user-driven services that have a greater impact on their users.

Key findings across countries on Dimension 6 – Proactiveness

Proactiveness remains a challenging dimension for many countries, with an average score of 0.567 (Figure 9). This dimension assesses governments' capacity to anticipate the needs of users and service providers so as to deliver government services proactively. Aspects assessed in this dimension include responsible and strategic use of AI, proactive service design and delivery, risk assessments, and anticipating future actions through data analytics. Countries have made considerable progress in formulating strategic approaches to the use of AI in the public sector and in creating non-binding instruments for its responsible and ethical deployment. At the national level, 89% of countries have a strategic document for AI in the public sector together with policy levers to ensure the ethical management and use of algorithms by public sector institutions. This conclusion is further supported by countries' performance on the transversal facet also reinforces this conclusion, as evidenced by the high level of the strategic approach and policy levers (see Table 7).

Figure 9. Proactiveness dimension, results by country



Note: Data for Germany, Greece, Slovakia, Switzerland, and the United States are not included. Refer to Methodological note.
Source: OECD Survey on Digital Government 2.0.

Table 7. Proactiveness dimension, OECD average by transversal facet

Strategic approach	Policy levers	Implementation	Monitoring	*Proactiveness* Average
70%	63%	53%	45%	57%

Note: The four transversal facets reflect the different stages of the policy cycle for each dimension. The percentages denote normalised scores, indicating the proportion of points obtained from the total available points on each column. For further details refer to the Methodological note.
Source: OECD Survey on Digital Government 2.0.

The top ten performers in this dimension are Korea, Estonia, the United Kingdom, Denmark, Türkiye, Norway, Australia, Iceland, Ireland and Finland. All top ten countries proactively engage diverse actors including sub-national governments and citizens throughout the development of digital government services. They also have conducted government-wide consultations on the impact of digital tools for improving government services.

Nevertheless, there is significant room to improve governments' capacity to better use data and AI to anticipate user needs, design and deliver public services that are more responsive and proactive.

Governments can use data for anticipation, planning, and monitoring, as well as to track the execution of data policy and initiatives. Results show that countries perform at the mid-range of the maturity scale with a score of 0.5 out of 1 when measuring government-wide initiatives using data to anticipate and plan government interventions in areas such as public budgeting and financial management, forecasting and predicting natural disasters, human resource needs in the public sector, among others. Differences across countries are notable, with 45% of countries showing high maturity levels (above 0.7) and 50% of countries showing low maturity levels (below 0.3), including 32% of countries having no initiatives at all.

A similar pattern emerges when assessing the initiatives to design and deliver government services based on users' data (e.g., needs, feedback, satisfaction, among others), with 42% of countries showing high maturity levels (above 0.7), 39% of countries showing low maturity levels (below 0.3), and 34% of countries having no initiatives at all. However, countries show lower maturity levels on the use of data to strengthen policy monitoring and evaluation, with 32% of countries showing high maturity levels (above 0.7), 61% of countries showing low maturity levels (below 0.3), and 34% of countries having no initiatives at all.

While some countries have been deploying a wide range of initiatives to enhance their capacity to use AI in the public sector, implementation is still a challenge across most countries. 66% of countries have used AI to improve internal governmental processes, while only 32% on enhancing policies.

Finally, most OECD countries are working towards a proactive assessment of risks during the implementation and operation of their investments on digital government (e.g., related to service continuity and cybersecurity). However, less than half of countries have established defined mechanisms to assess risks for digital government investments. Further efforts are thus needed to consistently assess the impact of digital government investments on the functioning of governments, on society, and on the environment. This would enhance governments' resilience to unexpected crises. An increased availability of risk assessment instruments would also be relevant tools to evaluate ex-ante the environmental or ethical impact of using specific technologies in the public sector, such as AI.

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Annex A. Country scores

Table A.1. 2023 OECD Digital Government Index Results

Country	Digital by Design	Data-driven public sector	Government as a Platform	Open by Default	User-Driven	Proactiveness	Composite Score	Ranking
KOR	0.971	1.000	0.913	0.882	0.909	0.934	0.935	1
DNK	0.851	0.833	0.896	0.783	0.715	0.788	0.811	2
GBR	0.914	0.598	0.696	0.667	0.925	0.853	0.775	3
NOR	0.758	0.851	0.818	0.588	0.853	0.750	0.770	4
AUS	0.973	0.774	0.738	0.466	0.833	0.736	0.753	5
EST	0.692	0.949	0.705	0.623	0.614	0.869	0.742	6
COL	0.814	0.794	0.654	0.731	0.775	0.647	0.736	7
IRL	0.844	0.861	0.632	0.560	0.684	0.701	0.714	8
FRA	0.677	0.816	0.577	0.761	0.595	0.561	0.665	9
CAN	0.829	0.640	0.436	0.727	0.749	0.547	0.655	10
PRT	0.770	0.555	0.593	0.493	0.809	0.618	0.640	11
FIN	0.721	0.679	0.676	0.428	0.667	0.663	0.639	12
ISL	0.676	0.597	0.659	0.503	0.668	0.713	0.636	13
LTU	0.590	0.753	0.651	0.561	0.619	0.477	0.608	14
OECD	0.684	0.633	0.615	0.525	0.607	0.567	0.605	
ESP	0.697	0.529	0.616	0.647	0.508	0.598	0.599	15
LVA	0.685	0.654	0.678	0.629	0.551	0.385	0.597	16
CZE	0.613	0.679	0.631	0.642	0.571	0.421	0.593	17
TUR	0.689	0.554	0.607	0.235	0.669	0.760	0.586	18
ITA	0.684	0.534	0.590	0.549	0.650	0.461	0.578	19
POL	0.627	0.598	0.667	0.502	0.615	0.415	0.571	20
LUX	0.672	0.476	0.675	0.411	0.534	0.637	0.567	21
NLD	0.679	0.513	0.579	0.521	0.442	0.639	0.562	22
AUT	0.766	0.380	0.773	0.416	0.483	0.465	0.547	23
BEL	0.652	0.543	0.664	0.347	0.580	0.448	0.539	24
MEX	0.658	0.473	0.638	0.466	0.479	0.501	0.536	25
SWE	0.486	0.746	0.489	0.512	0.436	0.478	0.525	26
NZL	0.588	0.549	0.437	0.297	0.519	0.610	0.500	27
SVN	0.559	0.489	0.621	0.465	0.328	0.527	0.498	28
ISR	0.536	0.472	0.573	0.542	0.669	0.179	0.495	29
HUN	0.593	0.677	0.413	0.456	0.432	0.374	0.491	30
JPN	0.609	0.525	0.505	0.389	0.440	0.431	0.483	31
CHL	0.407	0.469	0.374	0.250	0.383	0.504	0.398	32
CRI	0.283	0.317	0.118	0.288	0.321	0.019	0.224	33
PER	0.780	0.790	0.530	0.512	0.814	0.292	0.620	
BRA	0.622	0.628	0.645	0.522	0.639	0.658	0.619	
ARG	0.573	0.443	0.404	0.323	0.450	0.309	0.417	
HRV	0.496	0.535	0.403	0.380	0.269	0.063	0.358	
ROU	0.420	0.280	0.146	0.243	0.038	0.063	0.198	

Note: Data are not available for Germany, Greece, Slovakia, Switzerland, and the United States.
Source: OECD Survey on Digital Government 2.0.

Annex B. Methodological note

Pilot edition and methodological update

The pilot edition of the Digital Government Index in 2019 was developed in close collaboration with the OECD Working Party of Senior Digital Government Official (E-Leaders) as an exercise to test the development of a new generation of OECD digital government indicators. Data was collected through the pilot OECD Survey on Digital Government 1.0, conducted between August and December 2018. The Index and methodological results were published in 2020 (OECD, 2020[4]; Ubaldi and Okubo, 2020[5])).

Feedback and lessons from the pilot edition led to a thorough revision process conducted by the Task Force on Digital Government Indicators in 2021. The Task Force consisted of representatives from 14 member countries (Australia, Belgium, Canada, Colombia, Denmark, Finland, Italy, Japan, Korea, Latvia, Luxembourg, New Zealand, Spain, and the United Kingdom) and 2 partner countries (Brazil and Singapore), with a total of 49 individual participants. The Task Force held four meetings throughout 2021, focusing on different dimensions of digital government. It provided more than 400 comments to the Secretariat to finetune the Survey.

The OECD Survey on Digital Government 2.0, which serves as the data collection instrument of the 2023 edition of the DGI, is composed of 94 questions covering each of the six dimensions of the DGPF and four transversal facets that reflect the different stages of the policy cycle (*strategic approach, policy levers, implementation,* and *monitoring*). Some questions include sub-questions for a more in-depth assessment. Compared to the first version, the Survey gives a more balanced emphasis to implementation and monitoring mechanisms as per requested by the Task Force.

To better capture data from governments, the Survey was restructured to align it with the organic practice of digital government and the structure of the OECD Digital Government Reviews. It consists of five sections:

- governance of digital government (questions 1 to 19),
- public sector capacities for digital government (questions 20 to 52),
- data-driven public sector (questions 53 to 71),
- open government data (questions 72 to 79), and
- service design and delivery in the digital age (questions 80 to 94).

The Survey includes questions to capture the evolving landscape of digital government to better align the instruments with the priorities of the E-Leaders and the conceptual developments done by the Secretariat between 2020 and 2022. In addition to the post Covid-19 Pandemic assessment (used only for qualitative purposes), the Survey is informed by the conceptual frameworks on the governance for digital government, digital talent and skills in the public sector, and data-driven public sector and open government data based on the data collected through the *OECD Survey on Open Government Data 5.0*.

Additionally, the Survey includes countries novel priorities informed by the Task Force, e.g., digital public infrastructure, impact measurement, GovTech, rights in the digital age, and AI in the public sector. As a result of these changes, **the DGI pilot edition of 2020 serves as reference, but results cannot be compared due to changes in the Survey and underlying scores per dimension.** Yet, governments can take as reference their developments across the six dimensions between the 2020 and 2023 editions.

Data collection and calculation

The Survey collected evidence from the central/federal level of government, covering all ministries and agencies, spanning the period from January 2020 to October 2022. Survey respondents comprised high-level digital government officials of 33 OECD member countries and 4 accession countries. The period of data collection ran from November 2022 to January 2023. A glossary of terms was sent to respondents to guide them in terms of specific terminology.

Once the period of data collection was completed, country responses underwent a detailed data validation process designed to ensure the highest standards in data quality and accuracy. Country responses were reviewed to ensure internal consistency and to verify systematically that responses and supporting evidence corresponded to the respective question. A second round of data validation was conducted to ensure transversal consistency across survey sections and themes. For non-validated answers, countries were asked to provide clarification and further evidence, if applicable. The OECD Secretariat assessed the updated responses and evidence, validating or amending the responses with the underlying rationale and explanation. After this final round, each country officially approved their final responses for calculation.

The methodological approach used to calculate the DGI remains the same as in its pilot version, but the scoring system of individual data points has been refined to provide a more precise evaluation of digital government maturity. Each data point from the Survey (i.e., questions' response options) grants points based on predefined maturity benchmarks set by the DGPF and related thematic conceptual frameworks. Similar to the pilot edition of the DGI in 2019, points are then assigned to a corresponding DGPF dimension (see Tables B.1 to B.6), and the dimension scores are calculated by averaging all corresponding points within each dimension. The DGI composite score, which represents the overall digital government performance, is determined by averaging the scores of all dimensions. This composite score provides a complete assessment of a country's digital government maturity.

Table B.1. Dimension 1. Digital by Design

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
Digital by Design (16.67%)	Strategic Approach (3.51%)	1	Availability of a National Digital Government Strategy (NDGS) at central/federal level	Yes / No	0.44%
		1a	Enablers included in the NDGS to support its implementation (e.g., targets, timeframes, funding)	Multiple choice	0.44%
		4	NDGS alignment with other national strategies	Multiple choice	0.44%
		25	Availability of a public sector digital talent/skills strategy at central/federal level	Single choice	0.44%
		25a	Available content of the public sector digital talent/skills strategy	Multiple choice	0.44%
		25b	Types of public officials targeted by public sector digital talent/skills strategy	Multiple choice	0.44%
		35	Availability of a public sector information security policy/strategy	Yes / No	0.44%
		90	Availability of an omni-channel strategy to deliver public services	Yes / No	0.44%
	Policy levers (5.70%)	5	Existence of Digital by design or Digital by default principle	Single choice	0.44%
		6	Existence of an organisation-in-charge of digital government at the central/federal level	Yes / No	0.44%

		6a	Decision-making responsibilities of the organisation-in-charge of digital government	Multiple choice	0.37%
		6b	Functions of the organisation-in-charge of digital government to assist other public institutions in implementing digital government policies	Multiple choice	0.51%
		6c	Managerial level of the head of the organisation-in-charge of digital government	Single choice	0.44%
		7	Existence of a formal co-ordination body/mechanism for digital government policies and initiatives within the public sector	Yes / No	0.44%
		7a	Type of institutional representatives in the formal co-ordination body/mechanism	Multiple choice	0.44%
		7b	Advisory responsibilities of the formal co-ordination body/mechanism	Multiple choice	0.54%
		7c	Decision-making responsibilities of the formal co-ordination body/mechanism	Multiple choice	0.34%
		8	External advisory/consultation body for digital/ICT projects in the public sector	Single choice	0.44%
		8b	Roles of the external advisory/consultation body	Multiple choice	0.44%
		20	Laws covering key digital government topics	Multiple choice	0.44%
		34	Legislation/regulation pertaining to physical and cyber security of critical digital infrastructure	Yes / No	0.44%
	Implementation (4.82%)	7d	Frequency of formal co-ordination body meetings	Single choice	0.44%
		8c	Frequency of external co-ordination body meetings	Single choice	0.44%
		27	Actions taken by the organisation-in-charge of digital government on digital government skills	Multiple choice	0.44%
		28	Initiatives to attract digital talent in the public sector	Multiple choice	0.44%
		29	Actions by organisation-in-charge of digital government to develop and maintain digital government skills within the workforce	Multiple choice	0.44%
		30	Core skills covered by training programmes on digital government	Multiple choice	0.44%
		36	Existence of a public sector institution with mandate to investigate and prosecute cybercrime	Yes / No	0.44%
		37	Existence of a public sector institution in charge of coordinating cybersecurity at the national level	Yes / No	0.44%
		38	Availability of a National Computer Emergency Response Team (CERT)	Yes / No	0.44%
		39	Availability of a Security Operation Centre (SOC)	Single choice	0.44%
		90a	Characterisation of the service delivery channels	Multiple choice	0.44%
	Monitoring (2.63%)	2	Availability of Key Performance Indicators (KPIs) to monitor the NDGS	Single choice	0.44%
		18	Availability of a common methodology/tool to evaluate the impact of digital projects	Yes / No	0.44%
		18a	Areas in which the common methodology to evaluate the impact of digital projects is applied	Multiple choice	0.44%
		21	Performance assessment of digital government policies and services in accordance with existing laws.	Multiple choice	0.44%
		26	Conduction of a need assessment for digital skills in the public sector	Single choice	0.44%
		94	Measurement of transaction costs of service channels	Yes / No	0.44%

Source: Authors' elaboration

Table B.2. Dimension 2. Data-Driven Public Sector

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
Data-driven public sector (16.67%)	Strategic Approach (3.79%)	53	Availability of a public sector data strategy	Single choice	0.76%
		53a	Scope of the public sector data strategy	Multiple choice	0.76%
		53b	Goals covered by the public sector data strategy	Multiple choice	0.76%
		53d	Alignment between the public sector data strategy and other national strategies	Multiple choice	0.76%
		57	Availability of a national data protection authority	Yes / No	0.76%
	Policy levers (5.30%)	54	Requirements for assigning data leadership to a specific institution	Yes / No	0.76%
		56	Requirements for institutional roles/functions in data leadership	Yes / No	0.76%
		59	Availability of data quality framework at the central/federal government	Yes / No	0.76%
		60	Availability of data management standards or guidelines	Multiple choice	0.76%
		61	Formal requirements establishing rights in relation to data management	Multiple choice	0.76%
		63	Availability of formal requirement to share data between public institutions	Single choice	0.76%
		66	Requirements for maintenance of public sector data inventory	Single choice	0.76%
	Implementation (6.06%)	55	Public sector institution responsible for data leadership	Yes / No	0.76%
		58	Policy initiative(s) for ethical data management in the public sector	Yes / No	0.76%
		58a	Principles covered by the ethical management initiative(s)	Multiple choice	0.76%
		64	Availability of data interoperability system	Yes / No	0.76%
		64a	Coverage of the data interoperability system at national level	0 – 100 percentage	0.76%
		64b	Coverage of the data interoperability system at sub-national level	0 – 100 percentage	0.76%
		64c	Types of data exchanged through the data interoperability system	Multiple choice	0.76%
		65	Percentage of institutions charging fees for sharing data with other institutions	0 – 100 percentage	0.76%
	Monitoring (1.52%)	67	Existence of data inventory among institutions	0 – 100 percentage	0.76%
		68	Conduction of an assessment to evaluate the quality of data inventories	Yes / No	0.76%

Source: Authors' elaboration

Table B.3. Dimension 3. Government as a Platform

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
Government as a Platform (16.67%)	Strategic Approach (3.42%)	1c_2	Operational goals of the NDGS related to GaaP	Multiple choice	0.21%
		19	Inclusion of GovTech collaboration in NDGS	Yes / No	0.21%
		19b	Goals of the Govtech initiative	Multiple choice	0.43%
		32	Strategic approach to cloud infrastructure	Single choice	0.43%
		32a	Objectives set in the strategic approach to cloud infrastructure	Multiple choice	0.43%
		42	Availability of a digital identity strategy	Yes / No	0.43%
		42a	Types of service providers included in the strategy for digital identity	Multiple choice	0.43%
		43	Leading institution steering strategic direction and vision for digital identity	Yes / No	0.43%
		43a	Coverage of the mandate of the digital identity leading institution	Single choice	0.43%
	Policy levers (4.70%)	9	Availability of a standardised value proposition model for digital/ICT projects	Single choice	0.43%
		9a	Role of the value proposition method in the development of digital/ICT projects	Multiple choice	0.43%
		11	Availability of a standardised approval system for digital/ICT projects	Single choice	0.43%
		12	Availability of a standardised model for digital/ICT project management	Single choice	0.43%
		12a	Agile methodologies included in standardised digital/ICT project management model	Yes / No	0.43%
		14	Guidelines for digital/ICT procurement in the public sector.	Single choice	0.43%
		44	Inclusion of essential elements in regulatory frameworks for digital identity	Multiple choice	0.43%
		80	Availability of standards for public service design and delivery	Yes / No	0.43%
		80b	Formal requirement of standards for public service design and delivery	Single choice	0.43%
		80c	Mechanisms in place to support the application of public service standards	Multiple choice	0.43%
		94a	Availability of standardised mechanisms to measure transaction costs	Yes / No	0.43%
	Implementation (7.69%)	13	Availability of a dedicated fund for digital/ICT projects	Yes / No	0.43%
		15	Procurement mechanisms for digital/ICT goods and services at the central/federal government level.	Multiple choice	0.43%
		19a	Availability of a dedicated GovTech strategy, programme or initiative	Yes / No	0.43%
		19c	Availability of a dedicated team to manage and implement the GovTech initiative	Single choice	0.43%
		19d	Resources available to support the collaboration with GovTech ecosystems	Multiple choice	0.43%
		31	Available digital government infrastructures	Multiple choice	2.14%
		33	Availability of cloud infrastructure initiatives	Multiple choice	0.43%
		44a	Available digital identity authentication methods for accessing public services	Multiple choice	0.43%

		44b	Coverage of eligible population using digital identity solutions accessible via SMS, email, or authenticator app 2FA.	Single choice	0.64%
		44c	Percentage of public services accessible via digital identity with SMS, email, or authenticator app 2FA.	Single choice	0.64%
		45	Availability of digital identity solution to access public services for legal persons	Yes / No	0.43%
		46	Availability of cross-border digital identity solutions	Yes / No	0.43%
		47	Foreigners' capacity to access services by using a foreign digital identity solution	Yes / No	0.43%
	Monitoring (0.85%)	16	Availability of monitoring system to track progress of digital/ICT projects	Single choice	0.43%
		17	Implementation of ex-post cost-benefit analysis of digital/ICT projects	Yes / No	0.43%

Source: Authors' elaboration

Table B.4. Dimension 4. Open by Default

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
Open by Default (16.67%)	Strategic Approach (1.52%)	40	Policies promoting open-source software use in government	Yes / No	0.76%
		72	Existence of an open data strategy	Yes / No	0.76%
	Policy levers (3.03%)	41	Availability of guidelines to use open source to develop digital government initiatives	Yes / No	0.76%
		50	Availability of algorithmic transparency law, standard or guideline	Multiple choice	0.76%
		73	Requirements to publish open data for public sector organisations	Single choice	0.76%
		74	Mechanisms to incentivise open data publication	Yes / No	0.76%
	Implementation (9.85%)	16a	Available open information on the progress of digital/ICT projects	Single choice	0.76%
		40a	Available actions related to the use of open source	Multiple choice	0.76%
		50_c1	Available open algorithm register or equivalent	Multiple choice	0.76%
		62	Available mechanisms to enable the practical exercise of data rights	Multiple choice	0.76%
		75	Availability of high value open datasets	Multiple choice	3.79%
		76a	Public availability of indicators monitoring compliance of public institutions with open data requirements	Yes / No	0.76%
		91	Availability of a catalogue of services accessible to users	Yes / No	0.76%
		91a	Availability of accessible channels in the catalogue of services	Yes / No	0.76%
		91c	Available information on the service catalogue	Multiple choice	0.76%
	Monitoring (2.27%)	2a	Publicly available NDGS KPIs	Single choice	0.76%
		76	Indicators to monitor compliance of public institutions with open data requirements	Yes / No	0.76%
		77	Assessments evaluating open government data impact on public sector	Yes / No	0.25%

		78	Economic impact assessment of open government data	Yes / No	0.25%
		79	Social impact assessment of open government data	Yes / No	0.25%

Source: Authors' elaboration

Table B.5. Dimension 5. User-Driven

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
User-Driven (16.67%)	Strategic Approach (3.79%)	1b	Actors collaborating on the development of the NDGS	Multiple choice	0.76%
		1c	Operational goals of the NDGS related to user-driven	Multiple choice	0.76%
		24	Availability of an action plan to reduce digital divides	Single choice	0.76%
		24a	Issues targeted by the digital divides action plan	Multiple choice	0.76%
		24b	Demographic groups targeted by the digital divides action plan	Multiple choice	0.76%
	Policy levers (3.79%)	8a	Participants of the external consultation body on digital gov.	Multiple choice	0.76%
		24c	Enablers to support the implementation of the Digital divide action plan	Multiple choice	0.76%
		80a	Scope of the standards for public service design and delivery	Multiple choice	0.76%
		85	Actors involved in testing digital government services	Multiple choice	0.76%
		86	Formal requirements to use digital government tools involving users in policy design	Yes / No	0.76%
	Implementation (3.79%)	53c	Stakeholders consulted when developing the public sector data strategy	Multiple choice	0.76%
		83	Available initiatives to include population groups in public services design	Multiple choice	0.76%
		84	Tools used to engage users for co-designing government services	Multiple choice	0.76%
		85a	Available methods to test digital government services	Multiple choice	0.76%
		87	Initiatives using digital gov. tools to involve users in policy design	Multiple choice	0.76%
	Monitoring (5.30%)	3	Groups/areas included in digital government impact assessments	Multiple choice	0.76%
		23	Methods used by government to measure the digital divide	Multiple choice	0.76%
		23a	Demographic groups considered when measuring the digital divide	Multiple choice	0.76%
		24d	Mechanisms to monitor the progress of the digital divides action plan	Yes / No	0.76%
		88	Degree of measurement of user needs in digital government services throughout the design and delivery cycle	Multiple choice	0.76%
		89	Monitoring mechanism to understand the main barriers for co-designing digital gov. services	Multiple choice	0.76%
		93	Metrics to measure performance of digital government services	Multiple choice	0.76%

Source: Authors' elaboration

Table B.6. Dimension 6. Proactiveness

Weights of the dimension and its underlying transversal facets in the composite score (CS). Distribution of questions of the OECD Survey on Digital Government 2.0 and measured concepts.

Dimension	Transversal facet	Question number	Measured Concept	Type of Question	Weight in CS
Proactiveness (16.67%)	Strategic Approach (3.33%)	1c_1	Operational goals of the NDGS related to proactiveness	Multiple choice	0.83%
		48	Availability of a national strategy for AI in the public sector	Single choice	0.83%
		48a	Actors collaborating in developing the national strategy for AI in the public sector	Multiple choice	0.83%
		48b	Open public consultation conducted for the AI in the public sector strategy	Yes / No	0.83%
	Policy levers (3.33%)	22	Democratic rights acknowledged by laws, policies or guidelines	Multiple choice	0.83%
		49	Instruments to ensure ethical management and use of algorithms by public sector institutions	Single choice	0.83%
		49a	Principles covered by instruments to ensure ethical management and use of algorithms	Multiple choice	0.83%
		82	Available mechanisms to leverage the implementation of the “Once-Only Principle”	Multiple choice	0.83%
	Implementation (6.67%)	10a	Risk categories considered during risk assessments of digital/ICT projects	Multiple choice	0.83%
		51	Use of AI in the central/federal government	Multiple choice	2.50%
		69	Implemented initiatives to use data to anticipate and plan government interventions	Multiple choice	0.83%
		70	Implemented initiatives to use data to design and deliver digitally-enabled government services	Multiple choice	0.83%
		71	Implemented initiatives to use data to strengthen policy monitoring	Multiple choice	0.83%
		81	Engaged groups on the development of digitally-enabled government services	Multiple choice	0.83%
	Monitoring (3.33%)	10	Conducted risk assessments for digital/ICT projects at the central/federal government	Single choice	0.83%
		52	Availability of public bodies in charge of providing oversight or ethical advice for AI in the public sector	Multiple choice	0.83%
		52a	Type of advice provided by the body in charge of oversight or ethical advice for AI in the public sector	Multiple choice	0.83%
		92	Consultations on the impact of digital tools for improving government services	Yes / No	0.83%

Source: Authors’ elaboration

Annex C. Statistical validation

Several statistical tests have been executed to test the robustness and validity of the Digital Government Index (DGI) methodology. These tests aim to demonstrate how reliable the DGI is in measuring one underlying, unobservable concept (digital government maturity), as well as the validity of the choice of individual parameters and variables.

Correlation analysis

All 6 dimensions are strongly correlated with the overall index (0.8), which bring to validate the construct of the framework. As shown in Table C.1, the dimensions also exhibit positive correlations among themselves, suggesting that they measure the same underlying concept and serve as valid parameters for the Index.

Table C.1. Correlation between dimensions

		Digital by Design	Data-driven public sector	Government as a Platform	Open by Default	User-Driven	Proactiveness
Dimension		*Dim1*	*Dim2*	*Dim3*	*Dim4*	*Dim5*	*Dim6*
Digital by Design	*Dim1*	1.0	0.6	0.8	0.6	0.8	0.7
Data-driven public sector	*Dim2*	0.6	1.0	0.6	0.7	0.7	0.6
Government as a Platform	*Dim3*	0.8	0.6	1.0	0.6	0.7	0.7
Open by Default	*Dim4*	0.6	0.7	0.6	1.0	0.6	0.5
User-Driven	*Dim5*	0.8	0.7	0.7	0.6	1.0	0.7
Proactiveness	*Dim6*	0.7	0.6	0.7	0.5	0.7	1.0
DGI index		0.89	0.82	0.87	0.78	0.88	0.85

Note: Table shows the correlation of dimensions with other dimensions. All values are above 0.5, showing positive correlation.
Source: Authors' elaboration.

An additional test was conducted at the level of transversal facets to measure the internal coherence within dimensions. As shown in Table C.2, the positive correlations are equal or above the threshold limit of 0.3, which indicates that the dimensions are internally coherent and that they are measuring the same underlying concept. The results show that all parameters are positively correlated, with a medium size correlation, demonstrating the validity of the chosen parameters within each transversal facet and supporting the claim of robustness of the DGI methodology. In four instances, correlations approach the boundary limit, notably within the *Data-driven public sector* dimension. However, these results are statistically acceptable.

Table C.2. Correlations among transversal facets per dimension

Dim1	Implementation1	Monitoring 1	Policy levers1	Strategic approach1
Implementation2	1.0	0.4	0.6	0.6
Monitoring2	0.4	1.0	0.3	0.4
Policy levers2	0.6	0.3	1.0	0.5
Strategic approach2	0.6	0.4	0.5	1.0
Digital by Design	0.9	0.7	0.8	0.7
DGI index	0.7	0.7	0.7	0.6

Dim2	Implementation2	Monitoring 2	Policy levers2	Strategic approach2
Implementation1	1.0	0.6	0.3	0.3
Monitoring1	0.6	1.0	0.3	0.3
Policy levers1	0.3	0.3	1.0	0.6
Strategic approach1	0.3	0.3	0.6	1.0
Data-driven public sector	0.8	0.7	0.8	0.7
DGI index	0.6	0.4	0.6	0.7

Dim3	Implementation3	Monitoring 3	Policy levers3	Strategic approach3
Implementation3	1.0	0.5	0.3	0.6
Monitoring3	0.5	1.0	0.5	0.4
Policy levers3	0.3	0.5	1.0	0.4
Strategic approach3	0.6	0.4	0.4	1.0
Government as a Platform	0.9	0.7	0.7	0.8
DGI index	0.7	0.6	0.7	0.7

Dim4	Implementation4	Monitoring 4	Policy levers4	Strategic approach4
Implementation4	1.0	0.4	0.6	0.4
Monitoring4	0.4	1.0	0.5	0.3
Policy levers4	0.6	0.5	1.0	0.5
Strategic approach4	0.4	0.3	0.5	1.0
Open by Default	0.9	0.7	0.8	0.6
DGI index	0.8	0.4	0.5	0.6

Dim5	Implementation5	Monitoring 5	Policy levers5	Strategic approach5
Implementation6	1.0	0.6	0.6	0.5
Monitoring6	0.6	1.0	0.5	0.6
Policy levers6	0.6	0.5	1.0	0.4
Strategic approach6	0.5	0.6	0.4	1.0
User-Driven	0.8	0.9	0.8	0.7
DGI index	0.8	0.8	0.7	0.6

Dim6	Implementation6	Monitoring 6	Policy levers6	Strategic approach6
Implementation5	1.0	0.6	0.5	0.4
Monitoring5	0.6	1.0	0.6	0.5
Policy levers5	0.5	0.6	1.0	0.6
Strategic approach5	0.4	0.5	0.6	1.0
Proactiveness	0.9	0.8	0.8	0.7
DGI index	0.7	0.8	0.7	0.5

Note: Table shows the correlation of transversal facets within each dimension. Values show positive correlation.
Source: Authors' elaboration.

Principal component analysis (PCA)

PCA verification of the construct framework reveals that, at the overall DGI level, all dimensions converge to a single factor explaining the majority of variance (72%), with an Eigenvalue of 4.3. These results confirm confirms the validity of the DGI construct.

Cronbach's Alpha

Cronbach's Alpha is a coefficient of reliability based on the correlations between indicators. This statistical test is generally used to investigate the degree of correlation among a set of variables and to check the internal reliability of items in a model or survey. A Cronbach's Alpha coefficient equal to zero means that the variables are independent (e.g., the selection is not correlated and therefore is statistically not relevant), while a coefficient equal to one means that the variables are perfectly correlated. A Cronbach's Alpha close to or above 0.7 indicates a high degree of correlation among a set of variables.

At the question level, results for the Cronbach's Alpha test indicates that all the dimensions show a coefficient above 0.7. This result indicates that the variables are measuring the same underlying construct (see Table C.3). At the dimension level, the Cronbach's Alpha coefficient of 0.92 shows that all the six dimensions measure well the concept of the overall Index (see Table C.4).

Table C.3. Cronbach's Alfa results at the question level

	N of items	Cronbach's Alpha
Digital by Design	38	0.886
Data-driven public sector	22	0.780
Government as a Platform	35	0.859
Open by Default	20	0.712
User-Driven	22	0.866
Proactiveness	18	0.877

Note: Table presents the Cronbach's Alpha results at the question level, showing results above 0.7.
Source: Authors' elaboration.

Table C.4. Cronbach alfa results at the dimension level

	N of items	Cronbach's alpha
Overall index	6	0.92

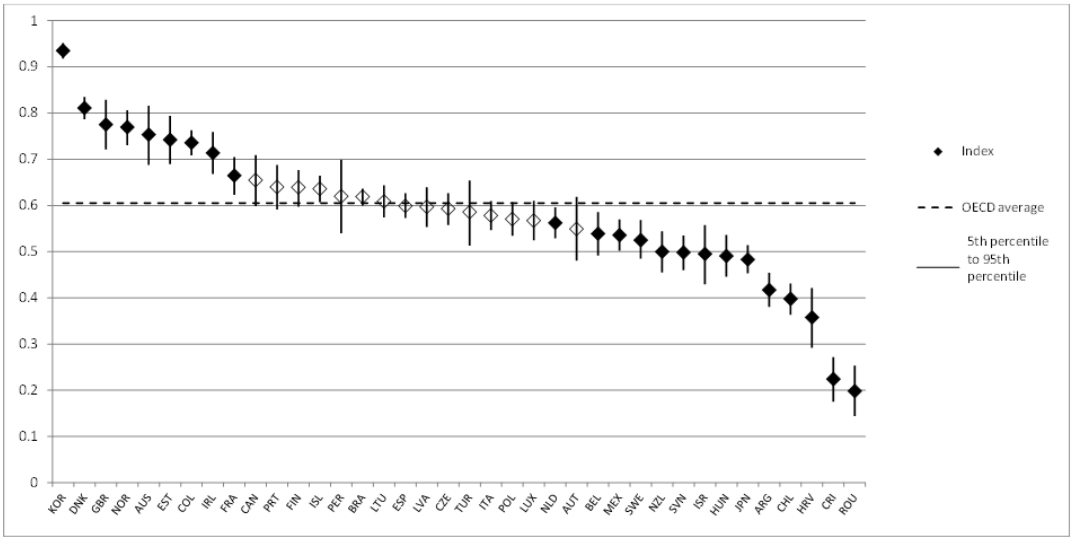
Note: Table presents the Cronbach Alpha results at the dimensions level, showing a result above 0.7.
Source: Authors' elaboration.

Sensitivity analysis

The results from the sensitivity analyses were implemented at the dimension level, showing that, for most countries, total scores are not very sensitive to the choice of values given to the categories (Figure C.1). However, the total scores of Türkiye and Peru appear to be more sensitive to the weightings applied. It is important to note that not all the combinations of weights used to create these intervals can be viewed as realistic outcomes (Arndt et al., 2015[6])).

One possible practical application for the analysis of the upper and lower bounds of these intervals is to consider how countries can be grouped together with a strong degree of confidence (Arndt et al., 2015[6]). The group of countries with black diamonds on the left-hand side of Figure A C.2 not only have a total score for their composite indicator that is above the average (expressed as a horizontal dotted average line), but also have scores above the average for 90% of random combinations (this is the case for nine OECD countries with a significantly high value). Conversely, on the right-hand side of the figure, countries that are marked with black diamonds score below the average for 90% of random combinations (with Costa Rica, as well as Romania well below the average). These two groups of countries can therefore be said to have indicator values which are significantly different from each other independent of the weighting scheme.

Figure C.1. Sensitivity analysis of the Digital Government Index



Note: Figure presents the sensitivity of the Index to various weighting assumptions (results from the Monte Carlo simulation where 5,000 different weights were assigned). Diamonds represent the indicator scores and vertical lines represent the 90% confidence intervals derived from the random weights analysis.
Source: Author's elaboration.