Organisation for Economic Co-operation and Development

GOV/SBO(2024)4

Unclassified

English text only

28 February 2024

PUBLIC GOVERNANCE DIRECTORATE
COMMITTEE OF SENIOR BUDGET OFFICIALS

Cancels & replaces the same document of 27 February 2024

Empowering fiscal reporting with digital and interactive approaches

Fiscal reports published by governments are often criticized for not meeting the needs of users. Digital and interactive fiscal reporting approaches are an opportunity to address this criticism.

This paper examines features of digital and interactive platforms developed by selected countries for fiscal reporting and discusses opportunities for the integration of more datasets and explores the use of Artificial Intelligence. It notes that digital and interactive fiscal reporting is currently at a crossroad between an advanced form of open-data and a tool for better public communication on fiscal issues.

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1. Introduction[1]

1. Traditionally, fiscal reports have served as a ledger, detailing the inflows and outflows of public funds. Later, governments started integrating management and performance information into fiscal reports. Most recently, governments started including climate, gender, and sustainability information in fiscal reports. Today, fiscal reporting needs to evolve further and serve additional purposes than demonstrating transparency on government spending and policy achievements: they should become a tool for empowering public understanding of key fiscal issues, fostering scrutiny and dialogue, as well as promoting trusted fiscal information.

2. Such an evolution is essential to support informed and inclusive discourse on fiscal challenges, opportunities, and choices, but this is also where the challenge lies. Fiscal reports must cater to a wide spectrum of users who vary greatly in their requirements and expertise, while conveying comprehensive, consistent, and reliable fiscal information to all of them. From policy analysts, economists, and public finance experts to the general public, each group has different informational needs and levels of financial literacy. In particular, fiscal reports laden with technical terms and complex tables can be a barrier to understanding for the non-expert.

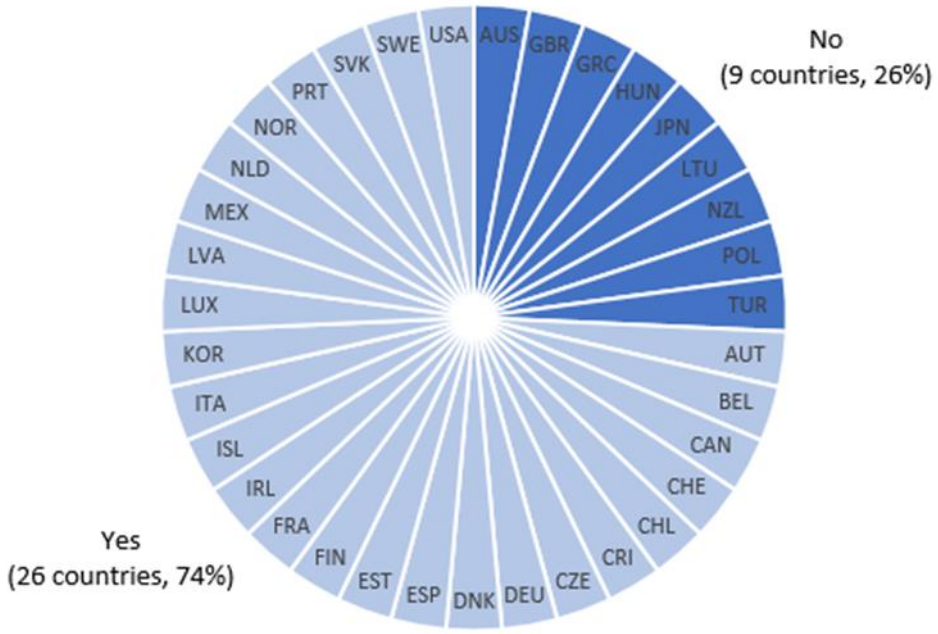
3. This can lead to a disconnect between fiscal realities and the perception of them by some users, undermining the very essence of fiscal transparency. For instance, a recent Financial Times article highlighted the phenomenon of "number numbness" in the context of fiscal events. This term refers to the difficulty that the public often faces in grasping the meaning of exceptionally large financial figures. The problem is not figures themselves, but how they're presented without adequate context or scaling, leading to a situation where, confronted with fiscal announcements and reports, "the only thing most people hear on such occasions is "big number, big number, big number, big number"" (O'Connor, 2023[1]).

4. Governments are increasingly recognizing that the effectiveness of fiscal reporting is significantly diminished if the information provided is inscrutable or not customized to its intended audience and are increasingly sizing opportunities offered by developments in technology to deliver fiscal information in new ways, as highlighted by an OECD Survey (OECD, 2022[2]).

5. At its most basic level, use of digital technologies for fiscal reporting involves the publication of open fiscal data (in open licence and machine-readable format), which is becoming a standard practice in OECD countries. At more advanced levels, it involves the combination of open fiscal data with business intelligence (BI) software to offer a new experience in exploring fiscal data, evolving towards data analytics, which is available already in around three-quarter of OECD countries (Figure 1.1).

[1] This paper was developed under the strategic direction of Jon Blondal, Head of the Public Management and Budgeting Division in OECD Public Governance Directorate. The report was authored by Delphine Moretti, Senior Policy Analyst in the same Division. Section 4.2 was co-authored with Nicolas Botton, OECD Consultant. Arron Rabbite, former Intern in in the Public Management and Budgeting division as part of the Allen Schick OECD Internship, prepared the ten case studies underpinning the report.

Figure 1.1. OECD countries: use of DIFR



Note: Approaches to digital and interactive fiscal reporting vary across OECD countries. Data for Colombia, Israel and Slovenia are not available.
Source: Authors' analysis, based on own research and analysis of weblinks for digital financial reporting provided in question 34 of the 2022 OECD Financial Management and Reporting Survey.

6. This approach in delivering fiscal data to users is called in this paper "digital and interactive fiscal reporting", or DIFR.[2] This term is used because to convey the idea that DIFR should be considered an integral part of a country's fiscal reporting framework. Countries however have different views as to whether DIFR is part of the fiscal reporting framework, as evidenced by the fact that responsibilities for the platforms may be outside of the ministry of finance and that countries have different ambitions and objectives, as well as varied levels of sophistication, in the features of their platforms.

7. Irrespective of this, the spread of DIFR is an important development. It has already provided opportunities for governments to address some of the challenges and criticisms with "traditional" fiscal reporting" and progress towards greater rationalization of their fiscal reporting frameworks (Box 1.1). It also creates the building block for a new era of modernization of fiscal reporting, where fiscal reporting would further align with key principles of digital government – that is becoming:

- "Digital by design", in that digital technologies and data would be leveraged to rethink and re-engineer processes, simplify procedures and create new channels of communication and engagement with stakeholders (OECD, 2021[3]).
- "User centric", in that it would have a service design and delivery focus as defined in the OECD Digital Government Policy Framework (OECD, 2020[4]).

[2] Such platforms are also being called "Fiscal Transparency Portals" (Global Initiative for Fiscal Transparency, 2019[28]).

Box 1.1. Key considerations for rationalizing fiscal reporting

1. **Ensuring consistency**

- Presentation of fiscal reports (forecasts, budgets, and accounts) should be consistent or bridging tables be systematically provided.
- Financial and non-financial data ("the data"), including performance data on gender equality, climate action or sustainable development goals, should be brought together into unified fiscal reports.

2. **Enhancing amenability**

- Fiscal reports should present financial and non-financial data in a multi-faceted way suited to users' main needs (consolidated/aggregated format and entity-level format; classification by type, administration or programme; etc).
- Digital channels should be used to allow parliamentarians and citizens to:
  - access comprehensive data.
  - structure their own queries rather than have to only read data the way governments want them to.
  - delve into the detail of data based on their needs.

3. **Effectively communicating**

- Communication of data should be tailored to key users' groups using effective approaches, including clear language and visual stories.
- Analysis and interpretation of complex and technical government financial information should be available to users, including those produced by independent fiscal institutions.

4. **Building trust**

- Forecasts, budget plans, performance information and accounts should be subject to independent review, audit or scrutiny to ensure their integrity.
- Government should make available a mix of in-year provisional fiscal data for timeliness and year-end externally reviewed data for reliability.

5. **Performing two-way assessment(s)**

- Regular and formal dialogue between governments, parliaments and other key groups of users should take place about fiscal reporting – e.g., whether their needs are met, how it could be improved.
- Measurements of benefits and full costs associated with reporting requirements should be undertaken by governments to inform reviews of fiscal reporting requirements.

Source: Authors, adapted from (Moretti, 2018[5])

8. Against this background, the purpose of this paper is to build on previous work by the Working Party of Financial Management and Reporting on "Rationalizing fiscal reporting" ((Moretti, 2018[5])), as well as on ten case studies produced for the preparation of this paper to:

- Highlight objectives of government in leveraging digital tools for fiscal reporting and key features of DIFR platforms (Section 2).
- Explore opportunities and challenges for further empowering DIFR, including by harnessing the power of Artificial Intelligence (AI) (Section 3).

2. Experiences in using digital and interactive fiscal reporting

2.1. Objectives of DIFR

9. Across the ten case studies produced for the preparation of this report, unsurprisingly, a central theme in implementing DIFR is the commitment to **transparency**, often translated into availability and accessibility of fiscal data. For instance, in the United States, the creation of the DIFR platform began with the signing into law of the Federal Funding Accountability and Transparency Act (FFATA) in 2006, with the goal of making both the government and Congress "accountable for their spending decisions by allowing regular taxpayers to follow the money" (Williamson, 2007[6]). In 2013, the Canadian Government stated that "technology is providing alternatives to static reports for making data available" (Canadian Government, 2013[7]). Another example is Germany, where the Federal Ministry of Finance aims to provide a reference information source to obtain information on federal public finances in a way that is "equally accessible to all" (Init, 2023[8]).

10. Other core objectives for DIFR are however highlighted in case studies. The first one is **accountability**. For instance, in the United States, DIFR was launched when legislation thus required that federal contract, grant, loan, and other financial awards be displayed on a "publicly accessible and searchable platform to give the American public access to information on how their tax dollars are being spent" (Bureau of the Fiscal Service, 2023[9]). In Italy, DIFR is expected to provide "a tool for the analysis, control and monitoring of public accounts, based on data collected and managed by the State General Accounting Office" (Ragioneria Generale dello Stato, 2009[10]).

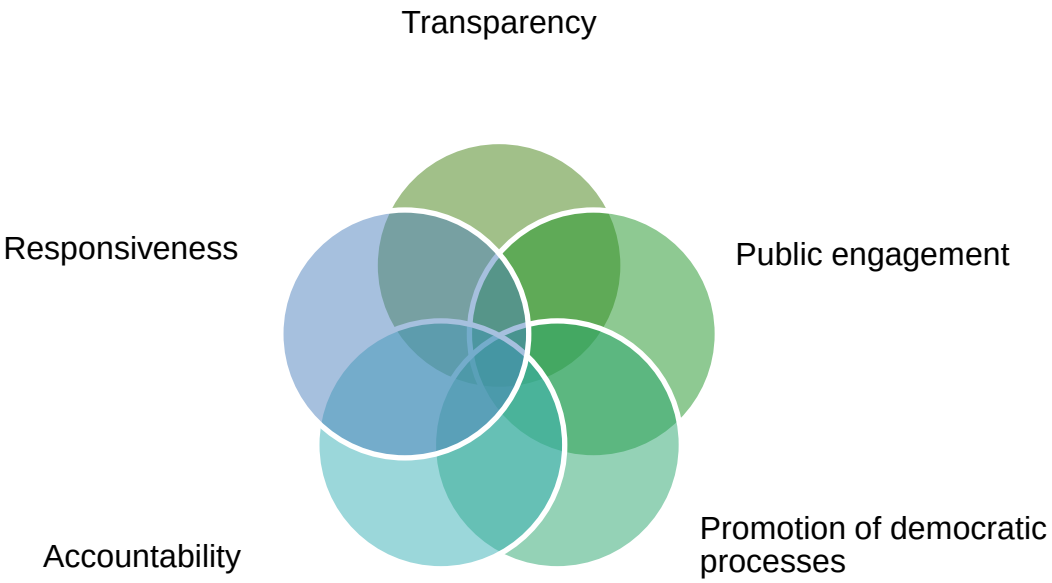
11. Another one is **responsiveness**. In Canada, for instance, the target users of this platform are parliamentarians, public servants, and Canadian citizens. Concerning parliamentarians specifically, the platform is highlighted as an important source of accessible information for those members of parliament who struggled to understand – and thus scrutinize – public finances.

12. Another common objective for some of the countries studied is enhancing **public engagement** on public resources allocation decisions and **promotion of democratic processes**. This reflects a broader shift towards inclusive governance, where informed citizens can contribute more meaningfully to public discourse and decision-making processes. For instance, in Germany, DIFR is expected to help citizens to get "insights into political decisions" and "form their own opinion" (Init, 2023[8]). In Ireland, the government developed DIFR with the expectation that citizens would use to help "formulate and interrogate policy proposals" (Department of Public Expenditure, 2017[11]).

13. Interestingly, in both Ireland and Mexico, DIFR was launched in the wake of the Global Financial Crisis (GFC), in "response to the need to make the use of public resources

and public finance policies transparent to citizens" (Government of Mexico, 2021[12]). In Ireland, the GFC was perceived by the government of the time to have developed "in part because of a lack of rigorous and informed public debate" supported by appropriate fiscal information (Department of Public Expenditure, 2017[11]).

Infographic 2.1. Objectives of digital and interactive fiscal reporting

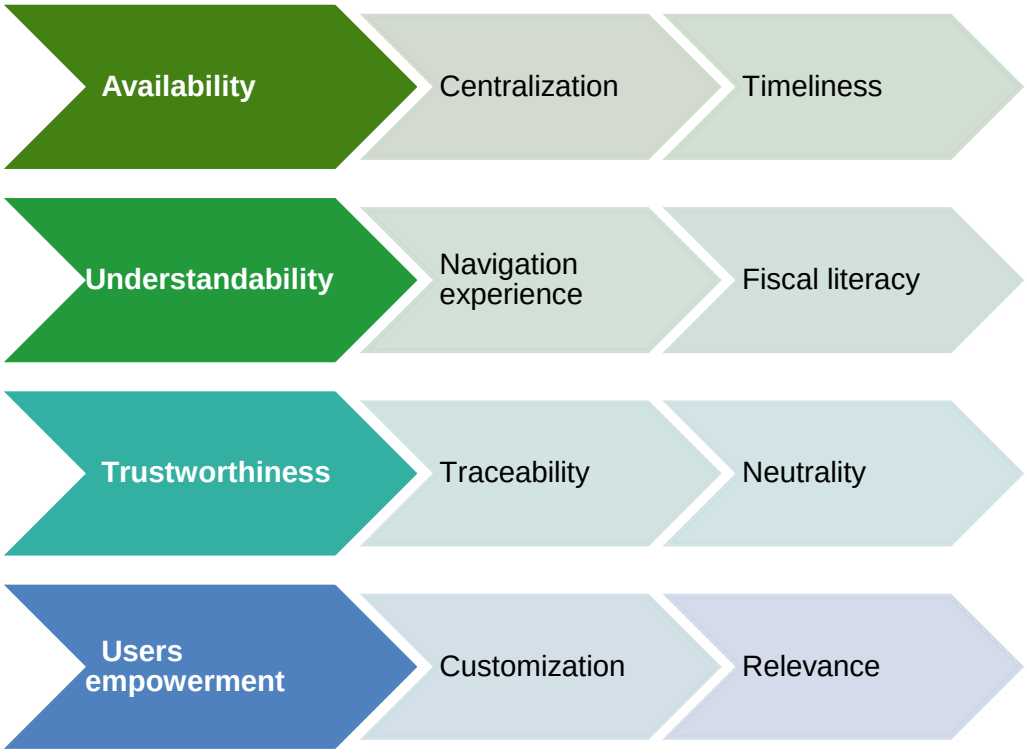


2.2. Key Attributes of DIFR platforms

14. Each individual DIFR platform studied for this paper have a unique combination of objectives. The way the DIFR platforms are designed, and the nature of the fiscal data and information provided on these platforms are, therefore, aligned with these stated objectives, and differ according to the countries studied. It is possible however to identify some key attributes of DIFR platforms across case studies.[3]

[3] Fiscal data and fiscal information, while closely related, refer to different aspects of fiscal reporting. Fiscal data refers to raw, unprocessed numbers and figures related to the government's financial operations. Fiscal data is quantitative in nature and is often presented in tables, charts, or databases. It serves as the foundation for analysis. Fiscal information, on the other hand, encompasses a broader and more processed form of fiscal data. It includes analysis, interpretation, and presentation of fiscal data. Fiscal information often involves contextualizing the data, highlighting trends, making comparisons, or even providing insights into the implications of fiscal policies and decisions.

Infographic 2.2. Attributes of digital and interactive fiscal reporting



2.2.1. Availability

15. The main attribute of DIFR platforms, with few exceptions, is to enhance the availability of fiscal data and information. Availability is achieved by centralizing a wide range of fiscal data in a single, accessible location; ensuring that this data is available in a prompt manner; and that it covers a relevant time-range. This strongly differentiates DIFR from traditional fiscal reports, which often have a more limited institutional scope; cover shorter time-periods and usually take significant time to produce and publish.

Centralization

16. Centralization means bringing key fiscal data on a single platform.[4] For instance, in Korea, DIFR is described as "an integrated fiscal data platform for the public" (Ministry of Economy and Finance, 2023[13]). In Iceland, also, the stated goal for DIFR is to publish "a range of information on Government operations and human resources" on a single interactive platform (Government of Iceland, 2021[14]).

17. The range of the data presented varies from one country to another, depending on stated objectives for the platform. In the case of Italy, for instance, DIFR provides subnational fiscal data so that for "comparisons between different departments and government entities", which in turn supports Italy's system of fiscal federalism (Ragioneria Generale dello Stato, 2009[10]). In Czechia, similarly, DIFR provides access to budget and accounting information "for all levels of state administration and territorial autonomy" to allow for comparability (Ministerstva Financí, 2023[15])

[4] This does not mean necessarily centralizing management of fiscal data.

18. Although the time-range of data provided on DIFR platforms is large, the nature of the data provided remains limited (Table 2.1.). Backward-looking expenditure data is the focus of most DIFR platforms, with revenue, debt, investment spending or tax expenditure data provided less systematically. Performance and HR data is rarely available.

Table 2.1. Case studies: Data available on DIFR platforms

	Expenditure	Revenue	Debt	Other financial data	Performance
Backward looking	10	7	3	8	1
Forward looking	4	3	2	1	0

Source: Authors, based on case studies

19. Beyond the centralization of fiscal data, a "one-stop-shop" approach to fiscal information is adopted in certain countries. This involves providing users with a comprehensive resource for accessing both traditional fiscal reports, fiscal datasets, and other relevant information such as evaluation reports. The benefit of this approach lies in its convenience for users, who have insurance that can access a wide range, or even the full range, of fiscal resources from a unified platform without the need to navigate through multiple sources. It can also be argued that it allows a higher level of fiscal transparency, as users are able to better "connect the dots".

20. Such an approach was for instance a driver of the DFIR initiative in the Netherlands, where the platform was developed with the intention to offer to professionals in the government financial domain a "one-stop shop" for all their public finance related queries. To this end, the platform combines traditional budget documents with open data, visualisations, information on legislative matters, policy evaluations and other information from the statistical office and relevant ministries. In the United States, the DIFR platform offers access to spending including federal awards such as contracts, grants, and loans.

Timeliness

21. The dynamic nature of updating data on DIFR platforms offers a significant advantage over traditional fiscal reporting in PDF formats. Unlike PDFs, which are static and require distribution of updated versions, platform data can be refreshed continuously and instantly accessible to users. This real-time updating ensures that users always have access to up-to-date data, an essential factor for relevance of fiscal reporting in our fast-paced environment.

22. Case studies show that the process of updating data on DIFR platforms varies by country, reflecting unique opportunities and constraints existing at national level, such as whether fiscal data is produced by one or more agencies and IT systems are centralised or not. For instance, in the United States, data on the platform is updated from various data sources after the "nightly data pipeline runs". In other countries, updates may be done less frequently – e.g., on a monthly basis in Czechia.

2.2.2. Understandability

23. Another main attribute of DIFR platforms is to foster understandability of fiscal data and information, which is an important difference between open fiscal data and DIFR initiatives. Examples include Germany, where DIFR has been developed with the explicit aim of making fiscal data and concepts "understandable for everyone" (Init, 2023[8]), or

Mexico, which aimed to make public finance information more attractive to citizens through the presentation of budget information in an intuitive, accessible and user-friendly format. Thoughtfully designed navigation experiences, including welcoming home pages and engaging visualizations, and the provision of comprehensive learning resources form the cornerstone of DIFR platforms' user-friendliness and ease of comprehension.

Navigation experience

24. Homepages conceived as an entryway from which users can easily navigate to different areas of the platform are a common feature across all case studies. The objective is to avoid that it takes to users a discouraging number of clicks and fruitless searches within platforms to find answers to simple questions. Approaches to increasing the intuitive nature of the homepage and ease of use vary but rely often on a dashboard where key data is easily accessible quickly to familiarise users with basic information before directing them to more detailed information that can be drilled into.

25. Concerning visualizations, some of the trends identifiable across case studies include the use of different visualizations for different types of data – e.g., bar charts for comparisons, pie charts for proportions, line graphs for trends over time, geographical maps for subnational governments' fiscal data (e.g., Italy and Czechia). – and of colour codes to enhance the readability and appeal of the visualizations. In addition, interactive elements are sometimes used for complex datasets like hover-over details, sliders, and filters allow users to engage with the data more deeply.

26. Further, most of the country studied identify at least two user profiles (public and experts) for their DIFR platform, with many of them identifying additional profiles. For instance, the developers of the United States' DIFR platform conducted meetings, workshops, user interviews and used analytics to figure out the needs of different users. From that, they developed a set of targeted user types, called "personas". The current platform thus targets a number of different groups: citizens; journalists; developers; budget analysts; recipients of federal awards; chief financial officers of government agencies; and repurposers of data (Federal Spending Transparency Collaboration Space, 2023[16])

27. This allows customizing platform navigation for these different profiles to provide a more targeted and effective user experience. For instance, this might mean:

- Steering or navigating users to tailored pieces of information or data points on the platform: for instance, in the case of Mexico, the home page of the DIFR platform provides different starting points for students, public servants, researchers, and data specialists. This provides links and directions to parts of the platform that would be of interest for each profile.
- Relying on different formats (e.g., visualizations and a drill-down approach for the public and on quick access to in-depth data and traditional tables for experts): for instance, in Italy, under each fiscal theme, there are three ways data is presented, designed to cater to the different audiences targeted by the DIFR platform.

Fiscal literacy

28. DIFR is in almost all cases not conceived only as platform for providing fiscal data and information, but also as educational tool for making fiscal concepts more accessible and understandable to a broader audience. To do so, the platforms rely on a range of learning resource, including lexicons, guides, explanatory videos that walk users through key fiscal concepts and how to read the data presented. Examples include:

- Germany, where key fiscal concepts are presented in an explanation section with a focus on explaining the concept of fiscal sustainability and familiarize users with the trade-offs associated with the action of preparing a budget through a video using the metaphor of a "budget as a cake". The user is also presented with a federal budget quiz to test their knowledge.
- Italy, where the DIFR platform comprises a "discover" section for each type of data. For example, for the public accounts data, it starts by explaining what public finances are, then shows the different indicators, before showing how Italy compares to other countries in Europe. Explanations of technical concepts are placed in a dedicated column on the left-hand side of the webpage.
- Mexico, the DIFR's platform gives an overview of all the different educational opportunities available to users of the platform, which include online classes on the budget, online diplomas in evaluating public policies and programmes, and in-person training opportunities.
- Finally, Canada, where DIFR makes use of hyperlinks which allows users to click on words and get definitions for technical concepts during their navigation. On each page, there also is a FAQ bar that provides context and further explanations where necessary.

29. Recognising the importance of a language accessible to everyone, some countries, beyond providing definitions of technical terms, try using plain language on their DIFR platform to ensure that citizens can easily understand fiscal data and information. For instance, in the case of Canada, the DIFR platforms operates within the broader policies on how the Government of Canada communicates with the public and consult with internal stakeholders prior to public. In the United States and Germany, also, the clarity and accessibility of language used in government communications and documents are codified in laws and apply to the DIFR platform.

2.2.3. Trustworthiness

30. Several countries seek providing a trustworthy and neutral source of information to the public with DIFR. For instance, in Ireland, DIFR is seen as a means for better informing citizens "in an environment of growing mis- and dis-information" (Department of Public Expenditure, 2023[17]). In Czechia, the DIFR platform's homepage states that one of the primary uses for the platform is getting "official, central and valid information about the economy of the state, cities, municipalities" (Ministerstva Financí, 2023[18]).

Traceability

31. In virtually all case study countries, financial data available on DIFR platforms is extracted from the financial management information system (FMIS) of the government, providing traceability, and then formatted for the purpose of the DIFR:

- In Korea, the FMIS is an "extracting, transforming, and loading" environment that extracts the data from multiple sources, transforms it into data that can be presented in a single data environment, and loads the results in a user-friendly manner.
- In Canada, all financial data must make use of Canadian data reporting requirements and standards (e.g., the Financial Administration Act). This standardized data is then extracted and loaded into an intermediary "data warehouse" where the data is consolidated and structured for the DIFR platform.

32. Beyond such traceability, how to ensure that reliable data is made available online is a challenging aspect of DIFR, which likely have an important impact on its development going forward. For traditional fiscal reports, the main source of insurance on the quality of fiscal data is the review or audit performed by external watchdogs. Some countries, such as Chile, have therefore adopted a similar approach in DIFR, with data being externally reviewed or audited before publication. When data is uploaded automatically, and frequently, on a DIFR platform, such external reviews or audits cannot be implemented. Trust in data will therefore depend on several factors that can be independent from the platform's own functioning and therefore difficult to demonstrate. They include:

- Quality of upstream budgeting and accounting processes - e.g., quality of the chart of accounts, accounting principles and rules, financial management and information systems (FMIS), human capacities.
- Data governance principles – e.g., what rules and processes are in place to secure generally data quality across government, FMIS data validation and transformation methods.

33. Trust in fiscal data also derives from openness. In the United States, the DIFR platform's section called "learn", a sub-section gives reference materials – a glossary, an "about the data" page, a data dictionary, and agency submission statistics. Then, the final sub-section provides information for developers – on the API (Application Programming Interface); platform patch release notes; and provides the open-source code for the platform. In Ireland, the DIFR platforms provides links to the open data on which this platform is built on the homepage.

Neutrality

34. Neutrality can be defined as the quality or state of being impartial, unbiased, and devoid of any favoritism or prejudice. It involves presenting information or data in an objective and balanced manner, without introducing any subjective interpretation, opinion, or judgment that could influence the perception of the information by the audience. Neutrality ensures that information is conveyed in a transparent and fair manner, allowing individuals to form their own conclusions and assessments based on the presented facts.

35. Virtually all platforms appear to aim at such neutrality by presenting fiscal data and information with limited alteration and interpretation - that is with limited pre-formatting of figures or addition of commentary. Neutrality in how fiscal data is presented on the DIFR platform is even sometimes considered a primary factor for trust in this data. For instance, in Canada, the government emphasized that DIFR supports trust in fiscal data by making it available in a neutral way.

2.2.4. Users' empowerment

36. Another common attribute for DIFR platforms is to empower users through the customization of their interaction with and exploration of fiscal data. In addition, DIFR aim to provide users, in particular the general public, with information that is at the level of granularity relevant to their day-to-day life and main concerns as citizens.

Personalization

37. Many DIFR platforms recognize the importance of empowering users in their interaction with fiscal data. These platforms enhance the user experience by providing dedicated tools for personalization and customization. These tools serve a dual purpose:

they make the user's journey through the wealth of fiscal data more efficient and allow users to tailor extractions and visualisations to their specific needs and preferences.

- Search features are one common tool used to simplify navigation on DIFR platforms (e.g., Czechia). These search functionalities enable users to quickly locate the information they seek, reducing the time spent searching for specific data points. Users can enter keywords, departments, or specific topics to find relevant fiscal information.
- Another tool is the generation of personalized dashboards (e.g., Germany or Ireland). These dashboards provide users with the capability to curate their own set of visualizations and reports based on their unique interests and requirements. Users can create, save, and download graphs that are particularly relevant to their inquiries, ensuring that the fiscal data they extract aligns precisely with their objectives.
- Moreover, the flexibility of DIFR extends to the formats in which users can save their customized reports. Graphs generated during the navigation can be easily saved as images or PDFs, allowing users to keep a record of their insights or share them with stakeholders. Additionally, the underlying data used to generate the graphs is available for download in formats like CSV or XLS.

Relevance

38. A distinctive feature of DIFR is that it does not only aim to provide large sets of data, but also aims to include, within this data, information that is most relevant to the needs of the users of the platform. The granularity of the data is tailored to address user concerns effectively, which may not be the case in traditional fiscal reporting.

39. For instance, in Czechia, the inclusion of fiscal data at municipality level as well as the search feature mentioned above support user-centric fiscal reporting. The search feature enables users to locate information about their municipalities directly from the homepage relatively effortlessly. The user then can compare spending across municipalities and regions through maps and graphs.

40. Another example is Mexico, where the DIFR platform displays local tax and fee collections at the state level through an interactive map. Users can hover their cursor over a given state top gather additional information – e.g., insights about regional financial health, enhancing their understanding of how local tax and fee collections contribute to the overall state revenue and how these funds might be allocated.

41. Relevance to users may also requires providing both financial and performance information. The public does not only want to know how much is spent but also how much is achieved. For instance, in Canada, on the DIFR platform’s finance and results sections, users can drill-down to sub-departmental levels to explore granular financial and results data (e.g., spending and performance of each program within the Departmental of Health).

3. The Digital and Interactive Fiscal Reporting journey

3.1. A short but evolutive history

3.1.1. An inherent capacity for change and evolution

42. DIFR platforms can be considered a new development in the area of fiscal reporting. In most of the countries studied, DIFR was launched from the mid-2010s (e.g., Czechia, Ireland, Italy or Mexico) or to the early 2020s (e.g., Iceland). A few countries however have a longer experience with DIFR. For instance, the Canadian Department of

Finance has endeavoured to make information more available and broadly disseminated to the public as early as 1998 and 1999. At that time, the department had already engaged with public focus groups to evolve its existing platform from being a static collection of documents to a more interactive and informative platform, as part of a broader initiative to enhance the digital dissemination of information.

43. Irrespective of when their DIFR platform was first launched, case studies reveal that most countries have undergone already at least one cycle of evolution and enhancement of their DIFR platform. This is because:

- Firstly, the rapid advancements in technology continually provide new opportunities to enhance user experiences, optimize data presentation, and improve accessibility. By embracing these innovations, platforms can stay at the forefront of usability and functionality.
- Secondly, as the needs of users change, platforms must adapt to meet these evolving requirements. For instance, the COVID-19 crisis generated new targeted reporting data needs, which have been fulfilled in many cases through the DIFR platforms (e.g., Canada and Netherlands).
- Lastly, over time, governments can put themselves in a position to gain a better understanding of potential shortcomings of their DIFR platforms and needs of their users.

44. Examples of relaunch of DIFR platforms include Ireland, which has focused on improving visual appeal, updating datasets, enhancing interactivity in graphs, and emphasizing data "drilldowns" for in-depth analysis; or Canada, whose data collection process was made adaptable to changing reporting requests with regular assessment of data relevance, timeliness, and archiving, along with attracting data scientists and developers.

45. Overall, case studies highlight that DIFR's inherent adaptability is one of the stronger contrasts of this type of fiscal reporting compared to more static traditional fiscal reporting. DIFR can be continuously updated and expanded to accommodate changing needs and priorities for fiscal information. Further, as technology advances and new data sources become available, DIFR can seamlessly integrate these developments. This makes it a singular and necessary component of any fiscal reporting framework in a rapidly changing world.

3.1.2. Achievements to date

46. Most countries monitor traffic on the DIFR platform with analytics platforms -e.g., number of users, page views or duration of stay. Most ministries of finance identify spikes and dips throughout the annual budget cycle, e.g., when the budget proposal is published, and the years, e.g., during the Covid-19 pandemic. However, overall, DIFR initiatives appear to have track record of achievements to date. For instance:

- In Canada, analytics show that number of users of the platform increased from around 13,000 in 2017 to more than 122,000 after COVID-19, representing an increase of 838%.
- In Italy, the year of its launch, the platform received more than 240,000 going up to more than 800,000 views and 25,000 downloads in 2018, representing an increase of 233%.
- In Mexico, page visits increased more than 108,000 to more than 175 000 from 2016 to 2019, representing an increase of 62%.

47. Despite this success, promoting DIFR platforms remains necessary to achieve the ambitious objectives outlined by governments. Firstly, people need to know the platform exists, ensuring it reaches its target audience. Secondly, they must be informed about the valuable features and information it offers, creating awareness of its benefits. Lastly, users need to recognize that DIFR is a credible alternative to traditional fiscal reporting, establishing it as recognized and even preferred source for fiscal information in the digital age.

48. Germany provides a noteworthy example of promoting a DIFR platform as central and credible source of fiscal information. References to the national DIFR platform are incorporated into all government communications, including the Ministry of Finance's platform, print materials, social media, and campaigns. For instance, for a recent information campaign on the federal budget, launched in September 2023, the DIFR platform served as the primary landing page, reaching several million views.

3.1.3. DIFR at crossroads?

49. DIFR is defined in this paper as "the combination of open fiscal data with BI software, to develop platforms that offer a new experience in exploring fiscal data". Case studies confirm that DIFR initiatives are strongly linked to the open-data movement, defined by the OECD as "promoting transparency, accountability and value creation by making government data available to all", with for instance the United States' DFIR platform stating on its homepage that it is "the official open data source of federal spending information (...)".

50. While the linkage between DIFR and the open data movement is undeniable, DIFR's objectives and features also relate to a large extent to public communication, defined by the OECD as a function aimed at "delivering information, listening and responding to citizens in the service of the common good" and supporting the strategic objectives of the government including "enhancing transparency; rebuilding trust in public institutions; delivering information" (Box 3.1).

51. Whether DIFR should be considered primarily as an open-data initiative or rather as a tool of public communication on fiscal issues will impact its development going forward. If DIFR remains conceived as mainly an open-data type of initiative, future enhancements are likely to be technical in nature. If the ambition is to empower citizens' understanding of fiscal issues, improving communication approaches will be key. Opportunities for developments in both directions are discussed the sections below.

Box 3.1. OECD Key principles for effective public communication

The OECD defines *public* communication as the government function to deliver information, listen and respond to citizens in the service of the common good. It is distinct from *political* communication that is linked to political parties or election campaigns. Public communication is characterised as a core government function that can support several strategic objectives of governments, including enhancing transparency; enabling citizens' participation; rebuilding trust in public institutions; and supporting the design, implementation and evaluation of policies and services. The five key principles for effective public communication are:

Empowering the public communication function by setting appropriate mandates and developing strategies to guide the delivery of communication in the service of policy objectives and of the open government principles of transparency, integrity, accountability and stakeholder participation; and separating it, to the extent possible, from political communication.

Institutionalising and professionalising the function to have sufficient capacity, including by embedding the necessary skills and specialisations that are leading the transformation of the field, and ensuring adequate human and financial resources.

Transitioning towards a more informed communication, built around measurable policy objectives and grounded in evidence, through the acquisition of insights in the behaviours, perceptions, and preferences of diverse publics, and the evaluation of its activities against impact metrics.

Accompanying the **adoption of digital technologies and data** with considerations on their ethical use as well as the pursuit of inclusion and engagement.

Strengthening the strategic use of public communication to **counter mis- and disinformation**.

Features of good public communication include:

Inclusive communication: Practices for data- and insights- driven communications and the use of community messengers and influencers can serve to improve how inclusive communications are of diverse groups in society. They help to identify under-served groups and the barriers to information. insights then serve to reach them with more tailored messages or via relatable, trusted voices that are more likely to resonate than mainstream channels and content.

Responsive communication: Communicators have easier access to more frequent, precise and rich analytics on what information citizens are looking for that help them promptly respond to demand and adjust their strategies. Practices for social and organisational listening, which triangulate different sources of feedback and interactions with the public, are facilitating two-way communication in the place of top-down dissemination of information.

Compelling communication: including through the use of behavioural Insights (BI) to help shape how people navigate an increasingly complex, crowded information ecosystem.

Source: (OECD, 2021[19])

3.2. Opportunities for technical enhancements

3.2.1. Broadening data's range and improving granularity

52. Most OECD countries have undergone budgeting and accounting reforms in the last decades that have resulted in many cases in significant improvements of the quality, comprehensiveness and institutional coverage of financial data. However, the 2022 OECD Survey on Financial Management and Reporting suggests that data integration challenges probably remain significant as financial management information systems (FMIS) are often not integrated or even outdated (Keller, Beazley and Moretti, forthcoming[20]). Accordingly, DFIR approaches in individual countries have been both fostered by improvements in financial data centralization, harmonization, and quality, but also sometimes simultaneously limited by obsolescence of IT systems and technologies.

53. Overall, efforts remain to be made in most OECD countries to foster financial and non-financial data integration across entities of the public sector through:

- Adoption of data standards, development of data sharing agreements, and the general promotion of a data-driven culture (OECD, 2019[21]), which will allow widening the scope and range of the data made available on DIFR platforms.
- Adoption of appropriate technologies for data exchange, including rules and protocols for i) data access independently from the software applications used[5] and ii) for the usage of external platforms[6] - e.g., what is considered safe, validated data that can enter the DIFR platform and what is not.
- Development of appropriate capacities and skills in ministries of finance, as validation at entry of data is not enough to ensure that data outputs on DIFR platforms are systematically accurate and continue to require significant human moderation and monitoring.

54. Further, a fundamental shift in how financial and performance data are managed may be needed. Instead of expecting users to adapt to the nature and level of data available, standards and principles applying to accounting and non-financial data may have to be develop with the primary objective of collecting data that precisely meets users' needs, rather than focusing on presentation of this data.

3.2.2. Providing new experiences in engaging with the fiscal data

55. Despite providing a more interactive experience than traditional fiscal reporting, DIFR may need to catch up with developments in media experiences, like videos or links to external on-line content. It is notable that private sector corporations are already taking initiatives in this area. For instance, Vodafone, included in their 2023 annual report QR Codes linking the report on interactive online content, such as videos.[7] This approach is part of their "digital-first approach".

56. The use of Virtual Reality or Augmented Reality to improve visual representation of fiscal data or providing trainings could also increase the appeal of DIFR and increase understandability of fiscal data and information. For instance, a DIFR augmented reality

[5] e.g., large ecosystem solutions like X-Road or protocols like Application Programming Interfaces – APIs, JavaScript Object Notation – JSON, Service-Oriented Architecture - SOA that can itself use Simple Object Access Protocol – SOAP or Representational State Transfer – REST protocols.

[6] e.g., through the use of an ETL – Extract, Transform, Load

[7] 2023 Annual Report (vodafone.com)

module could allow to visualise spending on infrastructure in the form of the future infrastructure being digitally integrated in the actual landscape.

57. Looking ahead, DIFR could offer "expert simulation environments". Expert simulation environments are platforms enabling experts to engage and test scenarios in simulated environments. For instance, spending forecasts often rely on models that incorporate various datasets and use a set of variables. With expert simulation environments, users could gain ownership of these models, allowing them to challenge government assumptions. This would not only increase transparency, but also foster collaborative thinking and understanding of fiscal issues.

3.2.3. Harnessing the power of Generative AI?

58. Defining what is an AI system in is not a settled debate. However, recently, OECD countries approved a revised version of the Organisation's definition of an AI system, which has been characterised as a "machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environment" (OECD, 2024[22]).

59. AI technologies used today, sometimes referred to as "narrow AI", are designed and trained for a specific, narrow task or set of tasks like classifying, translating, answering queries based on datasets of texts and images. "Generative AI" (GenAI), uses different technologies such as deep learning neural layers, and has the capacity to produce more complex and "original" content.

60. OECD countries are already exploring potential uses of AI in budgeting and financial management. For instance, AI is used in France for improving the monitoring of risks and controls associated with spendings for central and local government. In Finland, Robotic Process automation and AI are used for processing purchase invoices.

61. However, ministries of finance are understandably cautious in rolling out new approaches involving end-to-end process automation or GenAI in the area of fiscal reporting. This can be explained by general risks with AI[8] and by fiscal reporting being specifically a highly regulated activity of governments, relying on strict nomenclatures and standards, as well as to the significant risks that GenAI involves in terms of false or deceptive outputs, which is at odds with the various principles (e.g., reliability, neutrality) underpinning fiscal reporting.

62. However, use cases in fiscal reporting, and risks associated with them, should start being systematically explored as the rapid acceleration in the pace of AI innovation, coupled with the increasing use of GenAI by the general public, will likely soon raise interest in and expectations on how these innovations can be leveraged by governments for increased transparency and accountability.

63. Also, as the public becomes increasingly accustomed to systems like ChatGPT, Bard, Bing, Jasper… the provision of similar functionalities on DIFR platforms may become necessary to avoid the risks that queries are directed towards random AI Chatbot

[8] The OECD Principles on AI, adopted in 2019, constitutes the first international standard agreed by governments for the responsible stewardship of trustworthy AI (OECD, 2019[26]). The AI Principles recognise the potential risks AI systems pose to human rights, privacy, fairness, and equality; robustness and safety; and the need to address these, such as by building transparency, accountability, and security into AI systems and enabling continuous monitoring and improvement (OECD, 2023[27]).

platforms with limited safeguards in selection of reliable data and less expertise in public finance. In other words, there would be a risk in using AI, but also a risk in not using it.

64. Existing use cases of AI and GenAI provide interesting references for starting to think of how these technologies could be leveraged in the area of fiscal reporting. For instance:

- Chatbots are increasingly used in the public sector to answer information queries of users. In the public finance area, in particular, tax administrations have been early adopters and use them for instance for answering citizens' queries on tax legislation.
- In the private sector, corporations of the finance sector are already exploring ways in which GenAI could be used for producing reporting and other output required for compliance purposes using the firm's data (OECD, 2023[23]).

65. Against this background, in the context of DIFR, three levels of use of AI-based technologies could be envisioned (Infographic 3):

- First, using AI/chatbots as tools for advanced search functionalities, data mining or ability to understand and process requests in various languages.
- Second, using AI/chatbots as virtual assistants using conversation (Natural Language Processing, or NLP) for handling "simple" queries of users such as producing figures, graphs, reports that use government's own nomenclature, classifications, etc. Importantly, in such cases, the chatbot would have limited set of authorized functions and would not be authorized in particular to interpret a query that would use imprecise terms or re-state the data downloaded on the platform (e.g., changing a pre-set classification).
- Third, using GenAI-powered virtual assistants for handling "complex" queries. This would involve that GenAI uses successive interactions with the user to deduce the context of a question, interpret its meaning and be granted autonomy in re-stating data to answer it.

66. Advancing on such a path would however require the wider reinforcement of AI-related policies in the public sector covering areas such as transparency on models' governance, accountability mechanisms for models' training, prevention of risk of bias and discrimination, security around models, etc.

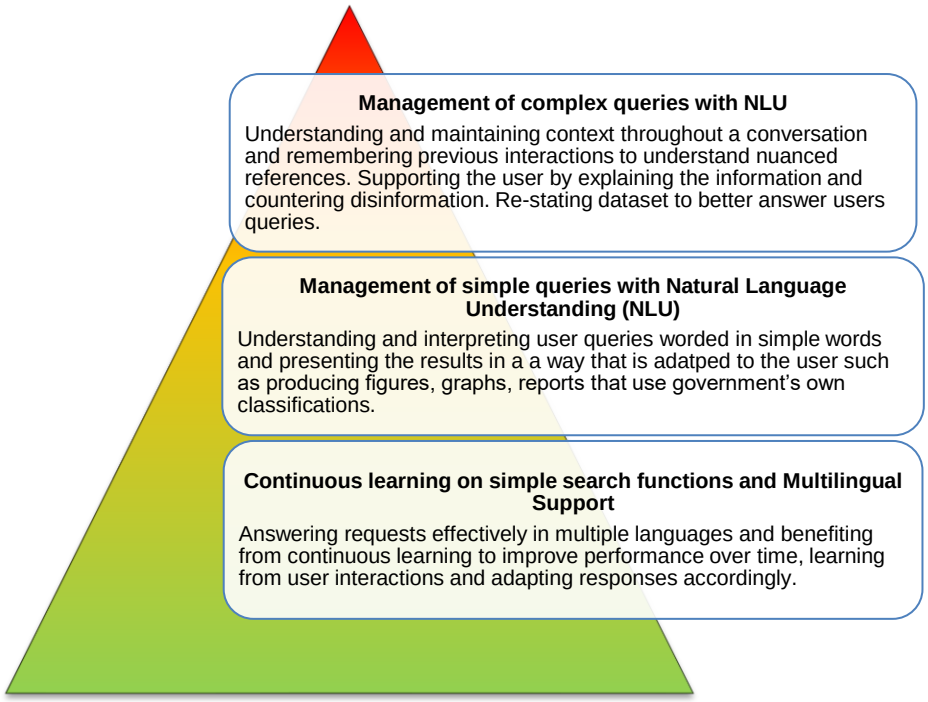
67. It would also require addressing fiscal reporting-specific challenges and risks, including:

- Use of GenAI and specifically Large Language Models require reliable datasets. Data quality and management, already mentioned above, would have a fundamental role in enabling for the training of reliable models and accurate outputs. Lack of quality, inappropriate granularity, gaps in data would generate risks of misleading outputs and inaccurate or unreliable trained models.
- Even with appropriate data quality and management, GenAI models may intentionally or inadvertently generate false, biased, or discriminatory results. Involvement of public finance experts as "moderators" would be necessary for a relatively long period of time before any AI model could be considered reliable.

68. Finally, although AI and |GenAI are presenting opportunities to enrich the user interaction with DIFR, it will require also to clearly define the limits of what the technology, in particular GenAI, will do. Beyond forbidding the use of non-governmental

data, it would be also important to delineate the types of questions that the technology can answer or cannot answer.[9]

Infographic 3.1. Opportunities offered by advanced Chatbots for DIFR, by level of risk



Source: Authors.

3.3. Opportunities for improvement to communication

3.3.1. Engaging the public

69. During the course of the preparation of this report, some countries underlined the importance of understanding visitors' use of their DIFR platform to improve its design and content, and the limited usefulness of website analytics for this purpose. Users' feedback is therefore sometimes collected *ex post*. Germany, for instance, has sought to better align its platform with users' needs by conducting workshops with representative groups (citizens, experts such as journalists or academics and legal experts) whose requirements, wishes and user behaviour have been studied to guide the new structure, user guidance and design of the platform.

70. Beyond punctual consultations of users, another approach, which appears however less explored as of today, would be to incorporate in the websites features that would allow for on-going public feedback, such as forums, Q&A sections, or comment areas on fiscal data and information. A further step would be to use DIFR platforms as a way to engage citizens in decisions on fiscal issues or gathering their reactions to fiscal decisions.

[9] Examples of restricted functionalities could include answering "is the budget fair?", "when is the public debt going to become unsustainable?" or "which public service budget should be reduced in priority in case of reduced revenues?"

3.3.2. Increasing understandability

71. DIFR is already recognizing the importance of explaining technical terms and concepts, as well as where possible a language that is accessible to everyone in communicating fiscal data. However, beyond efforts to enhance the understandability of fiscal data with digital glossaries and plain language, there's potential for greater impact by examining the effectiveness of traditional fiscal terminology and concepts in conveying fiscal information, as already started being done outside of DIFR platforms in some countries.

72. An example is New Zealand's introduction an Investment Statement to make government balance sheet information more user-friendly by classifying assets and liabilities in a way that explains how they support providing essential services for citizens rather than based on their technical, accounting nature (New Zealand Treasury, 2023[24]). This does not alter the substance of the fiscal information presented, but rather improve its form and presentation making it not only more understandable, but also more relatable, which is echoes the objectives and features of DIFR.

73. Further, the problem of numbness to big numbers does not appear to be tackled yet by DIFR. For instance, platforms do not offer systematically simulations that would break down complex fiscal data into relatable, manageable contexts – e.g., interacting with a budget presented on a hypothetical $100 allocation, allowing to grasp the relative proportions of different expenditures and revenue streams. The explanation for this may be that this would be at odds with the principle of presenting information on neutral basis, with minimal alteration.

3.3.3. Fostering fiscal insight

74. Fiscal literacy – i.e., understanding fiscal terminology and concepts – is distinct from fiscal insight – i.e., being aware of and understanding fiscal policies and issues. DIFR rarely engages in the area of fiscal insight. Exceptions include Korea’s DIFR platform that gives the user the ability to compare Korea to other countries in terms of fiscal revenue, expenditure, fiscal balance and general government debt, using international organizations’ data; the Netherlands, where the DIFR platform includes visualisations on expenditure ceilings, which are a cornerstone of the government’s fiscal framework and fiscal policy; and Germany, where a dedicated section of the DIFR platform states the government’s political priorities (investment, innovation and growth) as a context and explanation for planned spending. Again, initiatives in this area may have been hindered by the tension between presenting data neutrally and weaving it into a narrative for fostering insight of fiscal issues and challenges.

4. Conclusion

75. “Traditional” fiscal reporting is the undisputable cornerstone of fiscal transparency. It however is also characterised by its static and complex nature, making it difficult for non-specialists and digital natives to understand and engage with its information. The integration of DIFR into a government's fiscal reporting framework offers a solution to overcome these limitations. Moreover, it empowers governments to pursue additional objectives to those of traditional fiscal reporting, such as being more responsive to citizens' demands, fostering public engagement, and promoting democratic processes.

76. DIFR platforms appear to have already leveraged technology effectively to present fiscal information in new ways. Across the DIFR platforms studied for the preparation of this report, it was notable that:

- DIFR can allow for the centralisation and continuous availability of fiscal data, ensuring that users can access a large set of recent fiscal information at any time. This accessibility represents a significant shift from traditional fiscal reporting, where data availability was often limited in scope, and published with significant time-lags.
- DIFR can be designed for ease of use, ensuring that users can intuitively find and engage with the information they need. This includes streamlined an users-tailored navigation menus, user-friendly categorization of fiscal data and layouts, explanations on key fiscal terms and concepts that cater to both expert and novice users. These features collectively work to make fiscal information more accessible and engaging for a diverse audience.
- DIFR derive from open data initiatives and can provide a transparent trail for fiscal data, ensuring that users can trace information back to its source. This promotes trust in the data provided. It also presents the data in a mostly neutral way, which is an important element for promoting the credibility and reliability of DIFR platforms in an environment of growing mis-information.
- Finally, DIFR can empowers users to find, structure and download granular fiscal information tailored to their specific interests and needs, rather than seeing it the way governments (or accounting standards) want them to. This personalized approach aids in making fiscal information more meaningful to a diverse audience, thereby empowering them to better engage with public finance matters.

77. This does not mean that DIFR does not also face challenges. As noted in this report, improvements and enhancements are possible. In fact, there can be considered to be of DIFR's *raison d'être*, as platforms have already an history of quickly adjusting to technological advancements and changing user needs, to maintain their effectiveness and relevance. Such improvements would for instance include greater data quality, integration of more data sets, greater understandability, and new features to engage the public, possibly based on GenAI.

78. If improvements and enhancements are always needed, which ones will be pursued will depend on:

- Improvements to budgetary and accounting institutions that produce the data and data governance policies, which both support the production of timely and quality data.
- The objectives that individual governments will define for their fiscal reporting framework as a whole, including "new" objectives in the areas of fighting dis-information and fostering democratic process, and how each reporting stream (traditional reports, open-data and DIFR) will be expected to contribute to these.

79. Is it notable, in particular, that DIFR platforms are currently at a crossroad between an advanced form of open-data and a tool for better public communication on fiscal issues. Current features of the platforms are impressive, but it is uncertain that they have addressed yet some of the bigger issues with fostering fiscal understanding in the general public, e.g., "big number numbness", because data is often presented without context, narrative, or scaling.

80. This can be explained by a dilemma with DIFR that can be summarized as follows:

- On one hand, neutral presentation allows data to stand on its own merits, free from bias or influence, providing a clear, unaltered picture of the facts. However, this neutral approach risks preventing understanding of wider picture and issues, with users being deterred by a succession of "big numbers" that are not necessarily connected together.
- On the other hand, storytelling can enhance comprehension. Transforming raw data into a narrative that help contextualize the numbers can make fiscal policies and issues more understandable and relatable for the general public. However, this approach risks imparting a subjective angle to the information, potentially leading to suspicions of partisan story telling.

81. Approaches to better balancing in DIFR the two needs — the need for objectivity of fiscal data and the need of a providing a narrative that will support greater understanding of fiscal policies and issues — could be explored. This could allow DIFR to also address the "schism (...) between citizens and leaders" on their perception of budget issues, with citizens concerned with lack of transparency, which DIFR tries addressing, and decision makers more concerned with fostering understanding of the fiscal data and challenges – encapsulated by past studies as "inconsistency and contradictory view" as well as "wishful thinking" on the side of the public, or "people "wanting it all" but unwilling to pay for it"" (Tanaka, 2007[25]) – which DIFR is less focused on.

82. Further, initiatives to rationalize the delivery of fiscal information are need needed, with reporting streams co-existing and often overlapping. It is notable however that Ireland implemented a trial in this area, by taking out a non-financial table from "traditional fiscal reports" to bring it online in real time reporting after informing the legislature.

Annex A. DIFR platforms per case study country

Country	Name of DFIR platform (translated to English)	Link to platform
Canada	GC Infobase	https://www.tbs-sct.canada.ca/ems-sgd/edb-bdd/index-eng.html
Czechia	Monitor	https://monitor.statnipokladna.cz/
Germany	Federal budget	https://www.bundeshaushalt.de/DE/Home/home.html
Iceland	Government accounts	https://rikisreikningur.is/
Ireland	Where your money goes	https://whereyourmoneygoes.gov.ie/en/
Italy	Open Public Administration Database	https://openbdap.rgs.mef.gov.it/it
Korea	Open Fiscal Data	https://www.openfiscaldata.go.kr/op/ko/index
Mexico	Budget Transparency	https://www.transparenciapresupuestaria.gob.mx
Netherlands	State Finances	https://www.rijksfinancien.nl/visualisaties
USA	USAspending	https://www.usaspending.gov/

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