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Items for discussion and decision: Open data

Background document

Available in English only

Guidance on the implementation of open data in national statistical offices

Prepared by the Working Group on Open Data¹

¹ The Working Group on Open Data is subgroup on open data under the Friends of the Chair group created to work on principles, guidance and support for the implementation of open data in countries.

I. Introduction

National statistical offices (NSOs) are at the forefront of the data revolution, setting their own open data agendas, leading open data initiatives at the country level, or setting an important example for other agencies in the country's national statistical system (NSS). As NSOs embrace open data and begin to implement open data programs, it is clear that more than a dissemination strategy, a complex and integrated approach in collaboration with other stakeholders in the NSS and in accordance with existing laws and standards is required. However, limited prescriptive advice currently exists to help NSOs with their unique issues and opportunities when introducing open data to their existing operating frameworks.

The Working Group on Open Data of the United Nations Statistical Commission's Friends of the Chair Group on the Implementation of the Fundamental Principles of Official Statistics (FOC-FPOS) has undertaken the development of a guidance document for the assessment and practical application of open data in the context of official statistics on a few issue areas.

This background document provides a synthesis of existing open data work covering the concepts of open by default, user-centric models, best practices for national reporting platforms, data interoperability, and embedding data openness in the organisational culture to encourage uptake and use. The paper also highlights examples from countries, as well as specific guidance for NSOs on each topic.

II. Guidance on open data topics

Adopting an Open by Default approach

Defining Open by Default

Open by default is a fundamental principle of open data and one of the six principles of the Open Data Charter. The Open Data Charter broadly defines open by default under Principle 1 as a collection of actions undertaken by governments to ensure the regular and automatic publication of data by government agencies, including the adoption of policies, laws, and practices to encourage the "creation, use, exchange, and harmonization of open data."² This broad scope can be difficult for national statistical offices (NSOs) to translate into action and will be narrowed for the purposes of this section. Other topics sometimes discussed within an open by default framework are covered in later sections of this report.

This section, however, will specifically address open by default's most prominent legal aspect — the adoption of open data licenses. NSOs often provide guidance to users on how they can use

² <https://opendatacharter.net/principles/>

their data, either through data licenses, terms of use, or other policies. When discussing open data licenses, this report will include any published policy that governs the legal use and reuse of data, as well as any restrictions on that use.

It is important to note that this discussion of open data licensing does not apply in the same way across all kinds of data produced by NSOs. National statistical offices are the repositories of two kinds of data: microdata — which are the unit records of censuses, surveys, and administrative datasets — and aggregate statistics compiled from microdata. Because raw microdata contain individually identifiable information about people, businesses, or other entities, concerns about privacy, confidentiality, and security take precedent and are critical to the application of the Fundamental Principles of Official Statistics (FPOS).

Open data licensing should always be considered in parallel with disclosure risks. As these concerns vary by the kind of data, it should be made clear which types of data fall under the purview of any adopted license.

State of data licensing in statistics

Open licensing remains a huge challenge for national statistical offices and international agencies alike. According to the *Open Data Inventory (ODIN) 2018/19* report, only 14 out of 178 countries published all their data under an open data license.³ The Open Data Inventory assesses the coverage and openness of statistical data published by each country's NSO (in addition to other official data producing agencies) and therefore is the only index to measure the degree of openness in data licenses used by NSOs. Furthermore, ODIN 2018/19 results show that over half of the countries assessed have no published terms of use or have adopted restrictive data licenses (See Table 1A).

³ Open Data Inventory 2018/19 Annual Report, <http://odin.opendatawatch.com/Report/annualReport>

Table 1A: Licensing of Statistical Data in 178 Countries

License(s) for statistical data	
<i>Meet all open data standards</i>	14 countries (4%)
<i>Meet some open data standards</i>	10 countries (6%)
<i>Meet no open data standards</i>	10 countries (6%)
<i>Vary in openness</i>	86 countries (48%)
<i>Do not exist</i>	58 countries (33%)

Table 1A also highlights the many cases where countries have multiple data licenses between the NSO, NSO data portals, and other statistical producing agencies. The concern is not that multiple licenses exist, but rather that they vary in the degree of openness despite governing similar types of data.

Also notable are the substantial number of countries that do not publish a data license in any form. This is largely a testament to the lack of awareness of NSOs about licensing rather than an overt effort to stifle openness. Many NSOs assume incorrectly that publishing data online implies authorization of public use. However, there can be widely different interpretations of what authorized use looks like to governments and users. An open data license is an opportunity for governments to encourage public use of their data by specifically addressing how people can use data, how they should attribute data, and what types of use, if any, are prohibited. These specifics encourage use and reuse of data by alleviating user concerns about the legal ramifications of unapproved use.

Among many international agencies, the situation is much the same. An analysis by Open Data Watch concluded that only six of the forty-five members of the Committee for the Coordination of Statistical Activities (CCSA) have a license that satisfies the standards for openness. Unlike NSOs, however, the vast majority of CCSA members have an existing data license or terms of use (over 93 percent), but they often do not meet all open data standards. The most common restriction was a ban on the commercial use of data. Over 67 percent of the websites managed by CCSA members used a license that prohibited commercial use of data. A ban on commercial use is also common among NSOs, but not as common as the absence of licenses altogether.

Open data licensing standards

The most widely used standard for open licensing is Open Knowledge International’s Open Definition, which presents nine criteria that a license must have to be considered fully open. These criteria can be summarized as “anyone can freely access, use, modify, and share for any purpose”⁴

The Open Definition’s guidelines on licensing are especially useful to NSOs as they contain a list of certain conditions that can be added to a license without affecting its openness. Many NSOs choose to draft custom licenses that incorporate existing policies and country-specific laws. Therefore, knowing not only what a policy should include, but also not include, is invaluable. Table 1B presents these criteria.

Table 1B: Open Licensing Standards (Open Definition)

Open Data Licenses Must Allow:	Open Data Licenses Can Require (without sacrificing openness):
1. Free use	1. Attribution
2. Redistribution (including sale)	2. Integrity (modified versions must carry a different name)
3. Modification	3. Share-alike (distributions must remain under the same license)
4. Separation (any part of the work can be used, distributed or modified separately)	4. Notice (retention of copyright notices)
5. Compilation (can be distributed along with other works)	5. Source (provide recipients with access to the source data)
6. Non-discrimination against any persons or group	6. Technical restriction prohibition (measures cannot be added to restrict access)
7. Propagation without the need to agree to additional legal terms	7. Non-aggression (in some cases, the license may require modifiers to grant the public additional permissions, for example, patent licenses, as required for the exercise of the rights allowed by the license.)

⁴ <http://opendefinition.org/od/2.1/en/>

Open Data Licenses Must Allow:	Open Data Licenses Can Require (without sacrificing openness):
8. Application to any purpose	
9. No charge	

Many governments and NSOs also choose to adopt existing standard data licenses, such as Creative Commons, Open Data Commons, or simply using a public domain mark. A benefit is that a comprehensive legal code and a list of frequently asked questions already exists to assist users in understanding their rights. Creative Commons licenses also are translated into a multitude of languages. Those choosing this route should keep a few considerations in mind, including:

- 1) Not all Creative Commons and Open Data Commons licenses meet all open data standards in Table 1B (see a list of those that do in Table 1C).
- 2) Adding criteria or restrictions to standard licenses may invalidate them or impact their openness.
- 3) Licenses should be chosen within the context of existing policies and laws within the country and if contradictions arise, which takes precedent should be stated.

Table 1C: Common Standard Licenses

Creative Commons (CC)		Open Data Commons (ODC)	
<i>License</i>	<i>Openness</i>	<i>License</i>	<i>Openness</i>
<u>CC-0</u>	<p>This is the CC’s public domain dedication. By using this license, the dataset owner surrenders all rights to the public domain, when you otherwise may not be able to do so according to national law.</p> <p><i>Meets all open data standards.</i></p>	<u>ODC Public Domain Dedication and License</u>	<p>This is the ODCs public domain dedication. By using this license, the dataset owner surrenders all rights to the public domain, when you otherwise may not be able to do so according to national law.</p> <p><i>Meets all open data standards.</i></p>
<u>CC BY</u>	<p>This license allows users to use and reuse your data for commercial and noncommercial purposes so long as they cite the source.</p>	<u>ODC-BY</u>	<p>This license allows users to use and reuse your data for commercial and noncommercial purposes so long as they cite the source.</p>

Table 1C: Common Standard Licenses

Creative Commons (CC)		Open Data Commons (ODC)	
<i>License</i>	<i>Openness</i>	<i>License</i>	<i>Openness</i>
	<i>Meets all open data standards</i>		<i>Meets all open data standards</i>
<u>CC BY-ShareAlike (SA)</u>	<p>This license allows users to use and reuse your data for commercial and noncommercial purposes so long as they cite the source and distribute the data and any derivatives under the same license.</p> <p><i>Meets all open data standards</i></p>	<u>ODC Open Database License</u>	<p>This license allows users to use and reuse your data for commercial and noncommercial purposes so long as they cite the source and distribute the data and any derivatives under the same license.</p> <p><i>Meets all open data standards</i></p>
<u>CC BY-NonCommercial (NC)</u>	<p>This license allows users to use and reuse your data for noncommercial purposes only so long as they cite the source.</p> <p><i>Does not meet all open data standards</i></p>		
<u>CC BY-NC-SA</u>	<p>This license allows users to use and reuse your data for noncommercial purposes only so long as they cite the source and distribute the data and any derivatives under the same license.</p> <p><i>Does not meet all open data standards</i></p>		
<u>CC BY-NoDerivatives (ND)</u>	<p>This license allows users to use, but not reuse (create derivatives with) your data for commercial and noncommercial purposes so long as they cite the source.</p> <p><i>Does not meet all open data standards</i></p>		
<u>CC BY-NC-ND</u>	<p>This license allows users to use, but not reuse (create derivatives with) your data for noncommercial</p>		

Table 1C: Common Standard Licenses

Creative Commons (CC)		Open Data Commons (ODC)	
<i>License</i>	<i>Openness</i>	<i>License</i>	<i>Openness</i>
	<p>purposes only so long as they cite the source.</p> <p><i>Does not meet all open data standards</i></p>		

It is generally recommended that best practice for NSOs is to adopt one of the following licenses to govern the use of data that poses little to no privacy risks: CC0 (public domain), CC BY 4.0 (with attribution), or Public Domain Dedication and License (PDDL).

Country examples

The following country examples were collected in consultation with country members of the United Nations Statistical Commission’s Friends of the Chair Group on the Implementation of the Fundamental Principles of Official Statistics (FOC-FPOS) and other NSO representatives.

Government-wide licenses

In some countries, open data licenses are adopted at the national level and govern multiple agencies under its mandate. This approach is often the simplest for users, particularly those who use government data from various sources. It also has the benefit of creating an expectation of openness in both the demand and supply of government produced data.

Singapore

Singapore joined many other countries (like the UK, Germany, Italy, and Canada) in developing a government-wide open data license (ODL)⁵ in 2016. The year-long task was spearheaded by the data strategy division of the Ministry of Finance and the Infocomm Development Authority of Singapore. It was decided to create a standard ODL for official national data to ensure that all Singapore Government open data were governed by a consistent and user-friendly set of terms to encourage usage, both commercial and noncommercial, by researchers, developers, and the general public.

⁵ Singapore Open Data License Version 1, <https://data.gov.sg/open-data-licence>

Singapore's NSO, SingStat, decided to not simply adopt the Singapore ODL, but instead created a terms of use (TOU)⁶ for its website that made reference to the terms of the Singapore ODL. To do this, a review of the SingStat website's TOU by the Attorney General's Chambers (Singapore Government's legal department) was done to ensure that clauses in the SingStat website TOUs did not contradict the ODL. The review also led to adding additional language to the TOU to make clear which datasets it applied to, as well as indicating that in the event of any inconsistency between the terms of the ODL and SingStat website's TOU, the terms of the ODL should prevail.

New Zealand

New Zealand's model is unique in that they have not adopted a government-wide license, but rather created a framework for all government agencies to support the adoption of Creative Commons licenses. The New Zealand Government Open Access and Licensing (NZGOAL)⁷ framework was established in 2008 by the Open Government Data and Information Programme in the State Services Commission. NZGOAL, which was written with the assistance of an independent lawyer, provides guidance to all government agencies on how to apply Creative Commons licences (version 3.0) to information, data, and content published. The guidance explains the six different Creative Commons licences and the scenarios of different rights or objectives where it is appropriate to use them.

To develop the framework, a paper recommending the adoption of NZGOAL by all government agencies was approved by the Cabinet Committee. Meanwhile, the New Zealand Government funded a local non-government organisation affiliated to the International Creative Commons called Creative Commons Aotearoa New Zealand (now rebranded to Tohatoha) to be involved with ongoing improvements to the international licences to ensure they remained fully compatible with New Zealand law. In 2014, NZGOAL was revised to incorporate Creative Commons version 4.0.

Although there were no major barriers encountered in creating NZGOAL, there were challenges in getting agencies to consistently adopt NZGOAL and start actively licensing their publications. Lack of awareness about data licensing and copyright was prevalent. To combat this, training sessions were held for in-house lawyers, communications, media, and publishing staff and information managers. More recently, training has focused on helping procurement professionals realise the importance of establishing the rights to data and communicating them at the time of negotiating contracts for services.

⁶ Department of Statistics Singapore, "Terms of Use," <https://www.singstat.gov.sg/terms-of-use>

⁷ NZGOAL (New Zealand Government Open Access and Licensing) framework, <https://www.data.govt.nz/manage-data/policies/nzgoal/>

Adoption of standard licenses

The following country examples illustrate the process of adopting Creative Commons or Open Data Commons licenses, rather than developing a custom license.

Moldova

In the Republic of Moldova, there has been a legal mandate⁸ for public sector information to be published and made available for reuse for commercial and noncommercial purposes since 2012. The law stipulates largely the same principles as the Creative Commons (CC) BY 4.0 license. However, Moldova's NSO, Statistics Moldova, and other agencies had not incorporated the existing law into their data licenses or terms of use.

Until 2017, Statistics Moldova used only a copyright symbol on their website in absence of a data license, which they assumed was sufficient. After receiving many inquiries asking about permission to use and redistribute data, a frequently asked questions (FAQ) page was added to the website, although it did not contain much of the information relevant to open data licensing standards.

In 2017, Statistics Moldova officially adopted the CC BY 4.0 license when they became aware that Creative Commons licensing existed. The website⁹ now summarizes the main aspects of the license and provides specific examples on how to cite data. Statistics Moldova now reports that they no longer receive questions about terms of use for data, the number of citations from media agencies that use their data has increased exponentially, and that their terms of use page is regularly visited.

Australia

Like Moldova, Australia's NSO, the Australian Bureau of Statistics (ABS), took the initiative to adopt a Creative Commons (CC) license independently. In fact, ABS has a long history of using a CC license and was the first Australian government agency to introduce CC BY 4.0 to a range of statistical information on its website and select specialised consultancy datasets.

The process of adopting a CC license emerged as an organic, logical progression to promoting the wider user of statistics in line with the ABS' mission statement and coincided with increased demand for open access to public sector information. Due to users accessing ABS statistics for many purposes, including commercialising ABS data in bespoke reports for clients, the ABS has never pursued other licensing options (such as share-alike).

⁸ Republic of Moldova, "Law No. 305 of 26.12.2012," <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=347200>

⁹ Statistics Moldova, "Terms of use of data - National Bureau of Statistics of the Republic of Moldova," <https://statistica.gov.md/pageview.php?l=en&idc=534&id=5359>

The decision to move away from a full copyright of its statistical information was made prior to 2008. At the time, the ABS relied on its independence to adopt a CC license, but the decision was met with wide support across governments, researchers, businesses and the wider community. The application of CC licensing commenced from December 2008 and applied to all data published on the ABS website. From July 2010, a CC licence was extended to certain specialised consultancy datasets.

Adopting a CC license provided a number of operating benefits to the ABS and users alike, and therefore there was wide support, and minimal challenges, for implementing the change. Privacy was not affected by the ABS moving to a CC license for most of its statistics due to current ABS confidentiality practices. The adoption of a CC license was intended to enable users to explore and use ABS statistics with minimal barriers. It also enabled ABS to be recognised and attributed as the source of various statistics that are re-published by media, academia, and other organisational sectors.

An emerging challenge since its implementation is the expectation to always adopt the most current version of CC licensing, which can be a resource-intensive challenge as it involves rebranding all ABS products and webpages to recognise the difference in licensing. However, the use of a globally recognised standard such as CC licensing has provided a consistent and common framework for regular consumers of statistical information to interact with and also provides the ABS with the right to request that its statistics are correctly attributed or recognised in their resultant uses.

Netherlands

Adopting an open data license¹⁰ in the Netherlands was a government-wide process. In January 2012, a group of government organisations met on to how to best implement open data and what was needed. The group decided to focus on the following issues: 1) definition and starting points for open data; 2) technical aspects of open data; 3) legal aspects including publicity, liability, licensing policy, and market forces; and 4) the case for open data from a business perspective.

By February 2013, Statistics Netherlands (CBS) began to implement the decisions of the group. Based on the resulting report, the management board of CBS decided to use the CC BY 4.0 license, while other government agencies chose different licenses. For instance, the Ministry of Education, Culture and Science publishes data under a CC0 license.

CBS found various benefits of the new license for both users and the organisation, including increased clarity and added value for the user, as well as certain guarantees for CBS and limited liability for incorrect use.

¹⁰ Statistics Netherlands, “Open data,” <https://www.cbs.nl/en-gb/our-services/open-data>

Morocco

Morocco's NSO, the High Commissioner for Planning (HCP), created a data license¹¹ in 2017 alongside its new data portal. Prior to this, no license existed. This was the result of a taskforce delegated to improve the openness and the coverage of data using guidelines from the Open Data Inventory (ODIN) that were further endorsed by HCP's digital transformation strategy to enhance openness.

The Creative Commons (CC) BY 4.0 license was presented to management and approved for use for both HCP's website and data portal. However, microdata published by HCP for the most recent census and the household expenditure survey were made available under different terms of use because of privacy considerations.

Though a CC BY 4.0 license was adopted, HCP has incorporated their data license into their website terms of use rather than publish the license as a standalone policy. By doing so, they can also address the licensing of other aspects of their website, such as images, logos, icons, and so forth.

Creation of custom licenses

Here are examples of countries that have developed custom licenses for data published by the NSO.

Palestine

In 2018 Palestine's NSO, the Palestinian Central Bureau of Statistics (PCBS), began the process of developing an open data license. A working group within PCBS, named the "Harnessing the Data Revolution" team, prepared a concept paper derived from the Creative Commons (CC) attribution license after reviewing international experiences and best practices that included a proposed open data license¹². However, PCBS did not choose to adopt a CC license, but embed its own license within its website's terms of use (TOU). The language is not identical to CC licenses, but nearly so. The process took approximately four months from creation of the paper to the adoption of the license by PCBS management.

Since its adoption PCBS has conducted a series of workshops for its employees to raise awareness of the importance of the data revolution and open data, including the terms of use and open data license.

Oman

¹¹ https://www.hcp.ma/Conditions-generales-d-utilisation-Version-1-0_a2194.html

¹² <http://pcbs.gov.ps/article.aspx?TabID=1150&lang=en>

Since 2016 Oman’s National Center for Statistics and Information (NCSI) has developed a terms of use¹³ that meets open data standards, essentially adopting a public-domain-like license that specifies that no license is required to use or reuse their data.

In 2018, a review of Oman’s open government license was completed to see if it was more suitable to NCSI’s data. At the 2018 National Open Data Symposium, it was decided that the current license was more likely to increase data use and to enable developers to fully utilize NCSI’s data inventory to develop creative solutions without constraint. After the review of Oman’s open government license, NCSI found that some articles in the license might limit the developers somehow. Since these articles could not be removed from the license, it was decided to retain and update the current license instead.

Consultations on the new license were completed between NCSI’s business department and the business departments of the Ministry of Technology and Communication (previously Information and Technology Authority), as well as the Ministry of Legal Affairs to make sure the new license does not contradict any rules and regulations. Since the adoption of the new license, no inquiries have been made about the limitations or constraints regarding the usage of the data available in NCSI’s data portal.

Indonesia

In March 2017, Indonesia’s NSO, Badan Pusat Statistik (BPS) published a comprehensive terms of use¹⁴ on their website for users that draws on language from standard open data licenses. The license clearly states which types of data the license applies to and which it does not. BPS determines which data will be made open, depending on the data’s subject matter, and in consultation with BPS’s legal, dissemination, and IT teams. Though not all data on BPS’s website are made available under an open data license, this is a good example of providing clear guidance to users about where exceptions exist.

Guidance for NSOs

The process for developing or adopting an open data license can vary considerably as the country examples above show. Each country will need to choose their own path.

Adopting a government-wide license can be useful to provide guidance for all data producing agencies, but it is very time consuming and requires a high degree of coordination between agencies. In some cases, like Singapore, a government-wide open data license was created as a prevailing license for all agencies. While New Zealand took a different approach and created a licensing framework, leaving agencies to make their own licensing decisions.

¹³ National Center for Statistics and Information, “Terms of Use,” <https://data.gov.om/legal/termsofuse>

¹⁴ <https://www.bps.go.id/website/fileMenu/S&K.pdf>

When creating a government-wide license is not an option, NSOs should consider adopting a standard license. Creative Commons (CC) and Open Data Commons (ODC) licenses are the most frequently used. The three countries above adopted CC licenses with few barriers. If no existing policies or laws exist that would prevent adopting a standard license, this is typically the easiest and least time-consuming solution. However, many countries often add custom language to standard licenses which may add restrictions or invalidate it. To follow best practice, countries should either adopt an international open licence in its original form (possibly embedding it within their terms of use as in Morocco) or prepare a custom license following guidelines from the Open Definition.

Although many countries find that standard licenses are sufficient for their needs, NSOs should choose to create custom licenses when there are specific issues that standard licenses do not address. If this proves to be the case, it is best to use language from standard licenses as much as possible for clarity and to ensure adherence to open data standards.

It is also important to remember that open by default does not end at the adoption of an open data license. The most useful licenses are concise, clear, adopted by all agencies that produce public sector data, and are reinforced by a legal framework. This legal framework should include access to information laws or other accountability and access policies, which create not only a right to information, but a duty to proactively disclose data (while maintaining confidentiality). Additional guidance¹⁵ from the Sunlight Foundation exists for government agencies that want to develop their own policies while taking these legal considerations and others into account. National statistical offices and other agencies that produce statistical data should carefully consider the guidelines from this report and others, such as those from the Sunlight Foundation, through the full lifecycle of data, from production to use and reuse.

Incorporating a user-centric focus in open data

This section provides an overview of the guidelines for user-centered design from the Principles of SDG Indicator Reporting and Dissemination Platforms and guidelines for their applications¹⁶ challenges for their implementation, and opportunities for improving user-centered design in data dissemination. According to the Principles and Guidelines, “National Reporting and Dissemination Platforms should be designed for and with users (including both operational and end users, such as data consumers or NSO officers), and project owners should engage them in all phases of development.” Or, in simpler terms, user-centered design is about engaging users at all stages of platform development and data dissemination. When user-centered design is done well, it can increase data use and deliver the right data in the right formats to a wider group of

¹⁵ Sunlight Foundation, “Open Data Policy Guidelines” <https://sunlightfoundation.com/opendataguidelines/>

¹⁶ <https://unstats.un.org/unsd/statcom/50th-session/documents/BG-Item3a-Principles-guidelines-SDG-Monitoring-Reporting-Platforms-E.pdf>

stakeholders, which can start a virtuous cycle of data use that supports the open data movement at large. As decision makers find the datasets they need through user-centered design and the opening of data, they will make better decisions, which lead to better outcomes, and more support and funding for the creating and opening of data. Further, in many ways the principles of open data were created in response to user needs and hence user-centric design. As NSOs continue to learn from and respond to users through user-centric design, the standards for open data will evolve and be operationalized through user-centric design. Though user-centered design can be implemented to improve many aspects of data dissemination, the focus in this section will be on how user-centered design can improve dissemination efforts of national statistical office websites and data portals.

Implementing user-centered design at a national statistical office first requires a commitment to coordinating, communicating, and implementing suggestions from users. Without this commitment, tools that are in place to retrieve information from users on their preferences and needs will not be implemented. One way of streamlining user-centered design tools in an organisation's workflow is to create a user-engagement strategy that outlines what tools and practices an NSO should use and how they should inform the design of data portals, websites, and the dissemination of data. There are many tools that can be used to create this feedback loop with users: website analytics, surveys, interviews, and focus groups are four of the most common that we will discuss in this brief. While user-centered design can be implemented at all stages of development, this section focuses on the regular collection and analysis of data use and online user feedback to provide guidance on enhancements and modifications to website platforms.

To write this section and provide actionable insights on how NSOs can implement user-centered design, a survey was sent to NSOs that have been involved in the Friends of the Chair Group activities. This survey was designed to gain an understanding of how NSOs were implementing user-centered design and what practices could be adopted by others. The writing team would like to express their gratitude to representatives from Georgia, Hong Kong, Indonesia, Japan, Malaysia, Nepal, Palestine, Poland, Singapore, Thailand, United Kingdom, and Uzbekistan for providing their responses to the survey. They were all instrumental in providing feedback that informed this brief.

The authors also undertook a literature review to supplement the survey responses and provide recommendations to NSOs on the implementation of user-centered design. The results informed the writing of this section and the recommendations for NSOs: developing a user-engagement strategy; implementing website analytics; and carrying out surveys, focus groups, and creating website forms to provide qualitative feedback.

The principles of user-centric design

The relevance for user-centered design for NSOs stems directly from the Fundamental Principles of Official Statistics, the first principle of which states:

Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.¹⁷

Because users access data in a variety of ways, it is important for an NSO to understand users' rights and needs for public information. But user-centered design is important for practical purposes, as well.

The principles of user-centered design, when put in place, can increase the use of data and create greater user satisfaction, which can increase the stakeholders' trust in the NSO. Our survey revealed that that countries that incorporated user-centered design in their dissemination strategies implemented user-friendly additions or modifications to their data portals and dissemination platforms, such as:

- Creating a broader dissemination strategy
- Providing better, more interactive graphics, and supplementary information for datasets
- Supplying simpler explanations for datasets and their implications
- Making the data easier to access, find, and filter
- Providing better sex-disaggregated data

This list of actions created as a result of user-centered design approximates a list of best practices to increase the use of data and provides credence to the idea that if NSOs listen to users, they will design better products for their data dissemination. The following sections build on this idea by outlining some of the highest priority actions that NSOs can implement to better understand their users and supply them with the data they need and in the formats they prefer.

Developing a user-engagement strategy and streamlining user feedback into processes

The first step to implementing user-centered design activities is to ensure that the processes for getting feedback are streamlined into work protocols so that the feedback received from users is applied to improving data dissemination. This can be done by developing a user-engagement strategy for statistics or adding user-engagement activities into an existing dissemination strategy. Though there are a number of helpful tools that can provide a wealth of information on users' needs and guidance on how to improve portals, none of this will be of use if this information is not streamlined into existing processes to improve decision making. The

¹⁷ <https://unstats.un.org/unsd/dnss/gp/FP-Rev2013-E.pdf>

development of a strategy will also help NSOs to focus on the metrics and questions of greatest interest, so that they do not get overwhelmed by the feedback but leverage the information to solve the problems that are most important to them.

User-engagement strategies help to ensure that a variety of tools are used to reach out to data users and that the resulting information is used and processed by the right people to inform decision making. Cambodia provides an example of this and has developed a user-engagement strategy to ensure users' needs are met with statistical outputs through regular consultation and review. This strategy is strengthening their institutional framework to increase their accountability to users, upgrading and increasing their internal capacity, improving their existing statistical products, and increasing their dissemination efforts and upgrading their IT infrastructure. In implementing their user-engagement strategy, they faced resource challenges, coordination issues, and were limited by the historic lack of user engagement and an institutionalized mechanism for user feedback. Implementing user-centered design is not without its challenges.

Half of the countries surveyed either had a user-engagement strategy in place or were developing one, although there is no agreement on formatting or on what constitutes a user-engagement strategy versus a communications strategy (which several countries listed). Because there is no strict definition for what constitutes a user-engagement strategy, the authors leave it up to countries to decide how to format and create their own, although further information on the most important elements of a user-engagement strategy are provided in the recommendations section.

To increase user-centered design in dissemination efforts, either in the course of developing user-engagement strategies or streamlining user-engagement activities into existing communications or dissemination strategies, the working group presents several options: Countries could begin by sharing templates and guidelines for other countries to follow or organize country-level workshops to bring together stakeholders to agree upon a user-engagement strategy with the goal of increasing user-centered design. As the survey results demonstrated, a variety of different approaches have been taken to draft and implement user-engagement strategies, which could be the result of countries deciding to implement their own strategies or due to a lack of available and templates on guidance for user engagement, which could be a further area of support to NSOs.

Recommendations for NSOs to implement user-engagement strategies

1. If no user-engagement strategy has been created, then NSOs should convene a meeting with the relevant internal stakeholders in the NSS who are responsible for disseminating data to discuss the following questions and create strategies to answer them:
 - a. What feedback from users is most important in order for the NSO to perform its mission?

- b. How does the NSO plan on getting feedback? What existing systems does the NSO have that could be leveraged to retrieve the information?
 - c. How can user engagement strategies be incorporated in decision making processes, job descriptions, and organisational culture?
 2. If a user-engagement strategy is in place, it can be reviewed, and guidelines presented here can be used to update the strategy or the NSO can convene a meeting to ensure that the strategy is working correctly and address the following questions:
 - a. Is the user-engagement strategy reaching and retrieving feedback from all members of the public who might be users of the data?
 - b. Are there improvements that could be made to the process of using these data to inform design changes and decision making at the NSO?
 - c. Are there sufficient resources being devoted to ensuring that the user-engagement strategy is being properly implemented?

Implementing web analytics to understand users

Web analytics refers to the collection of data about users and their behavior on a website. Because the Internet has become the principal gateway to official statistics distributed by NSOs and other government agencies, almost every NSO maintains a website or data portal — some more than one — that offers access to official statistics. The installation of web analytics on a website disseminating official statistics can provide NSOs with a wealth of geographic information on site visitors, user behavior on the website (what pages they visited, for how long, and how often), and, by setting up the correct permissions, more detailed demographic information on users. This information can be used to improve the site and to understand what statistics are being accessed by different segments of the population.

The *Counting on Statistics*¹⁸ report by Open Data Watch and AidData surveyed data suppliers and users in 140 low- and middle-income countries and found that there was broad agreement on the importance of measuring data use. To do so, most countries preferred the use of web analytics. Measuring and understanding data use is critical to providing users with their preferred datasets and in their preferred formats.

There are a variety of free and proprietary software systems that can be used to generate and monitor web traffic data. Google Analytics, however, is by far the most widely adopted analytics tool because it is free, easy to implement, and it effectively reports actionable data that allows organisations to optimize their web content. In *Measuring Data Use*,¹⁹ Open Data Watch found

¹⁸ https://docs.aiddata.org/ad4/pdfs/Counting_on_Statistics--Full_Report.pdf

¹⁹ <https://opendatawatch.com/publications/measuring-data-use/>

that many countries do not have web analytics tools installed, do not have them optimized for measuring use, or do not have the capacity for using such tools even though they are installed. The last finding is particularly interesting as it points to the importance of developing a plan for implementation of the analytics in a dissemination strategy alongside the technical installation of the analytics.

Countries in our survey used web analytics in a number of ways to better design their sites for users, but the main use of web analytics was to better understand which datasets were popular among their users. These datasets could then be prioritized for more accessibility on the site, including the development of supplemental visualizations and materials to make them more accessible to a wider audience with different levels of capacity. To make the Google Analytics information more available within the NSO, Statistics Indonesia (BPS) created a dashboard for users. A dashboard enables broader use of the analytics data because they provide only the key metrics decision makers need and do not require them to sign into the analytics account and search for the metrics. Information and instructions on how to set up these dashboards in Google Data Studio can be found in *Measuring Data Use*,²⁰ which also provides information on setting up and improving the measurement of web traffic data on a site.

The information from website analytics provides quantitative data on user behavior and provides the lowest lift for organisations to implement, but without any other contact with users, this information will not be sufficient to implement user-centered design. The primary issue is that using only website analytics will track the people who visit the NSO website but not the people who never find the website due to capacity, findability, or other issues. This can bias the results and utility of the feedback provided. In recognition of the Fundamental Principles of Official Statistics' commitment to honor citizens' entitlement to public information, it is important to get feedback from all citizens. A related issue is that website analytics cannot answer questions on what changes need to be made to a site and the specific needs of their users. To better understand the population's needs for data dissemination and create possible solutions, focus groups, or interviews, and other qualitative methods need to be put in place.

Recommendations for NSOs to implement analytics on their websites

1. Include the use and capacity development for website analytics in user-engagement and dissemination strategies.
2. Install website analytics on the NSO website, if they are not already installed.
3. If analytics are already installed, then the following steps can be taken to ensure that they are being used to their fullest potential:

²⁰ https://opendatawatch.com/reference/annexes-measuring-data-use/#_ftn7

- a. Ensure that the analytics are being used by incorporating them in the decision-making process.
- b. Optimize the analytics to remove bot traffic.
- c. Create a dashboard from the analytics traffic so that the most important statistics can be accessed by decision makers and team members.

Implementing surveys, focus groups, meetings to understand users

Although website analytics can provide baseline statistics on who is using NSO sites and data, NSOs should consider also using feedback forms, user surveys, focus groups, and meetings to complement their website analytics data. These qualitative forms of user feedback can help answer questions that come out of analyses from the website analytics such as: why do users spend so little time on the site? How can we make the site more user-friendly? What datasets do users need that are not on the site? These pieces of information are difficult to gather using web analytics alone and are critical to making user-centered design improvements.

Survey results from 13 NSOs reveal that the most common form of qualitative feedback is a user survey, followed by comments and feedback forms on the NSO website, then user interviews or focus groups. It is encouraging to see that most countries are using both qualitative and quantitative methods for understanding user needs and implementing user-centered design, even in this small sample.

There are a variety of methods for obtaining user feedback. NSOs should employ their existing networks and survey systems first rather than create new outreach systems that may burden their respondents or complicate their feedback systems. Further, NSOs should create a pool of respondents that are representative of the public and potential users of the data to ensure that all citizens have their voices heard. Statistics Poland, for example, has a focus on ensuring that a wide variety of users can access and understand their statistics, especially young people. The agency has implemented new methods to engage the younger generation, including the use of social media and more engaging tactics for the youth like quizzes and gamification.²¹

Recommendations for NSOs to implement qualitative feedback tools:

1. Ensure that websites, at a minimum, have a mechanism for users to provide feedback on the website through a *contact us* form or website user survey. This should be well-placed on the website for users to find and the requests sent by users should be reviewed and responded to promptly.

²¹ Applying aspects of game playing to other activities to encourage engagement

2. Develop a user survey to reach out to a broad range of demographic groups regarding their website preferences and needs for data dissemination.
3. Create focus groups with representatives from key user demographics to better understand how the NSO and its dissemination website can fulfill their needs.

Using national reporting guidelines for open data platforms

This section integrates the *Principles of SDG Indicator Reporting and Dissemination Platforms and guidelines for their applications* into the open data agenda. According to the report, “A National Reporting and Dissemination Platform can be understood as a means to report and disseminate national statistics including SDG indicators and descriptive metadata, and refers to a web site, database(s), and associated IT infrastructure, workflows and processes used to collect, store, secure, and ultimately disseminate data and related metadata and documentation in an easily accessible way to reach all target users.”²² These can include key stakeholders such as policy makers, academia, non-governmental and nonprofit organisations, international organisations, media, businesses, and individual users. As more national statistical offices (NSOs) move to dissemination online through platforms, the impact of the characteristics of these platforms on data use and open data continues to grow. It is therefore critical for NSOs to focus not only on the existence of platforms to disseminate data but on utilizing good practices in the development and maintenance of these platforms, so that open data on them can be accessed and used by a variety of users to increase the data’s impact. National reporting and dissemination platforms could be standalone tools or the hub of a network of platforms, run by various agencies of the national statistical system. While the principles and guidelines of national reporting and dissemination platforms are specifically focused on the context of SDGs, these are also applicable to more general statistics reporting platforms. For the purpose of this paper, national reporting and dissemination platforms will be referred to as national reporting platforms or NRPs.

The NRP principles are intended to be universally applicable for member states to consider when implementing their national reporting platforms. The four principles consist of: clear institutional arrangements and management, which suggests coordination and cooperation within the national statistical system; fitness for purpose, which suggests cooperation and consultation with all users and stakeholders; sustainability, which suggests taking account of key objectives, resources, and capacity of a country; and interoperability and statistical standards, which suggests following international and national statistical standards and best practices. The principles have accompanying guidelines that are intended for countries that develop their platforms jointly with development partners and solution providers.

²² <https://unstats.un.org/unsd/statcom/50th-session/documents/BG-Item3a-Principles-guidelines-SDG-Monitoring-Reporting-Platforms-E.pdf>

To provide actionable insights on how NSOs can implement the NRP principles, the authors sent a survey to NSOs who have been involved in the Friends of the Chair group activities. This survey was designed to gain an understanding of how stakeholders develop a national reporting platform and implement the principles for reporting and dissemination platforms. The authors would like to express their gratitude representatives from Armenia, Indonesia, Kazakhstan, Mongolia, Poland, Singapore, Thailand, United Kingdom, and Uzbekistan for responding to the survey. They were all instrumental in providing feedback that informs this brief. Additional desk research was carried out to review the dissemination platforms for Jamaica, Denmark, and Rwanda.

Principles and guidelines for national reporting platforms

The purpose of the NRP principles is to guide NSOs in incorporating best practices for usability into their platforms. NSOs typically assume leadership in the national statistical system, where they are a critical actor in the implementation of standards. Depending on the structure of the national reporting platform, the role of the NSO may vary, although the NSO is typically the primary organisation in managing the platform, albeit with careful coordination with key producers of statistics within the national statistical system. The principles and guidelines are also integral to the mission of national statistical offices worldwide – to publish data that are available to all users.

Principle 1: Clear institutional arrangements and management

The first principle outlines the requirements for NSOs to create adequate documentation through laws, regulations, mandates, and standard operating procedures for the management and oversight of the development, implementation and maintenance of an NRP. This process should be led by the NSO, but all actors in the national statistical system (NSS) should be involved. The development of documentation will help reduce confusion over the responsibilities of different actors in the NSS and their roles in managing the NRP, leading to increased efficiency and a better managed NRP.

Guidance for Principle 1: Clear institutional arrangement and management

For countries that lack a legal mandate for the coordination of the production of official statistics, introducing an amendment or an article to the existing statistics act can address this issue. This should entail a comprehensive review of the existing statistics act to assess areas where revisions are required. Countries should have adequate financial and staff resources to undertake legal procedures and to urge actors within the national statistical system to support the revision of the statistics act. With adequate resources and institutional support, countries can then undertake necessary revisions of the statistics act, which will pave the path to fulfilling the first principle.

Country examples for Principle 1: Clear institutional arrangement and management

Countries that responded to the survey used a range of different tools to establish clear institutional arrangements in accordance with the first principle, ranging from the use of presidential decrees to the inclusion of management protocols in laws. An assessment by PARIS21 on Jamaica's national statistical system highlights the importance of these kinds of arrangements. Coordination on the production of official statistics is not legally mandated in Jamaica, and consequently there is a lack of coordination between producers of statistics in the country.²³ Other countries have codified clear institutional arrangements and management into their existing statistical laws. Rwanda's Law on the Organisation of Statistical Activities in Rwanda specifically outlines the coordination of the statistical system, under which the National Institute of Statistics Rwanda is the institution that is responsible for the coordination.²⁴

Principle 2: Fitness for purpose

The second principle outlines how a national reporting platform should be established in cooperation and consultation with all stakeholders, in compliance with the FPOS, and address the needs of subnational, national, regional, and global monitoring reporting. If a country follows this procedure, then the NRP should be aligned with the goals and needs of the NSO and will be fit for purpose. In addition, this principle is designed to reduce the reporting burden.

Guidance for Principle 2: Fitness for purpose

National strategies for the development of statistics (NSDSs) can serve as an essential tool for codifying fitness for purpose of national reporting platforms for open data. Development of future strategies will entail substantial collaboration with stakeholders across all sectors. National statistical offices should be responsible for coordinating and facilitating meetings with stakeholders within and beyond the NSS to further understand their needs, from a global to a sub-national level, to ensure that fitness for purpose is incorporated in the goals, objectives, and tasks of an NSDS.

Country Examples for Principle 2: Fitness for purpose

Countries responding to the survey noted a number of improvements and adjustments to NRPs that were made in order to make them fit for purpose. These include the development of application programming interfaces (APIs), new data platforms, multilingual capacity, improved search functionality, and more intuitive website design. These developments took place through a dialogue between members of the national statistical system and other stakeholders.

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https://sustainabledevelopment.un.org/content/documents/19511National_Statistical_System_Assessment_2018_JAMAICA.pdf

²⁴ http://statistics.gov.rw/sites/default/files/Official_Gazette_no_Special_of_16.06.2013.pdf

To create a platform that is fit for purpose, the principles stress the importance of collaboration between stakeholders inside and outside of the NSS in order to agree on what the purpose is. Uzbekistan worked to gather this feedback by holding an international conference on open data called Open Data Tashkent 2019. The event had high-level political support from the Uzbekistan government and brought together partners to discuss the open data environment in Uzbekistan and how to address problems as well as how to leverage best practices from international development practitioners for the development of open data portals. The United Kingdom took a more focused approach to creating a fit-for-purpose platform by conducting user research and focus groups to understand how their NRP could better fill user needs. Other countries have worked to enshrine the ideals of fitness for purpose and cooperation into their national strategies, for example, Denmark highlights the importance of statistical cooperation with other producers of statistics in their NSDS.

A platform that is fit for purpose should have datasets that meet the needs of all users. Although designed for the SDGs, Statistics Poland has a national reporting platform that has two sets of indicators: a global set comprised of UN indicators for monitoring SDG targets and a national set of indicators, focusing on Poland's priorities within the 17 goals. Having two sets of indicators addresses the needs of both international and national users. Furthermore, Statistics Poland is continuously working on expanding its NRP to address the needs of other users, particularly in local government and in the private sector.

Principle 3: Sustainability

The third principle states that the purpose, scope, features, development, and implementation of a national reporting platform should take into account the specific objectives of the country and the resources and capacities required over the medium and long term. National statistical offices and partner organisations should consider specific objectives of the country in ensuring the sustainability and support of the national reporting platform. The accompanying guidelines include: national ownership, collaboration, user-centered design, data communication, modularity and extensibility, standardized interfaces, scalability, open data, linked data.

Guidance for Principle 3: Sustainability

National statistical offices must take into consideration their existing capacity and financial resources when developing and managing an NRP. If a national statistical office has very limited resources from government funding and from existing donors, then the implementation of free and open-source software is even more critical to ensure the long-term sustainability of the platform. As a result, the existing resources can be prioritized to build capacity for necessary staff to continuously develop and maintain the national reporting platform.

Country Examples for Principle 3: Sustainability

Countries responding to the survey noted various methods for developing and managing an NRP sustainably. These include the use of open-source software. According to the Open Source Initiative, the first criteria for the distribution terms of open-source software is free redistribution and that “the license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.”²⁵

The use of open-source software contributes sustainability of national reporting platforms. Because Statistics Poland’s national reporting platform uses open-source software that is free of charge, the NSO can use its existing resources and capacity to continue enhancing and improving the quality of its national reporting platform instead of paying for expensive licenses. It will also benefit from future developments of the software contributed by other users.

Principle 4: Interoperability and statistical standards

The fourth principle emphasizes the importance of following statistical standards in the development of statistical products, especially for supporting data harmonization across the different stages of statistical production, including common data structure definitions and code lists. NSOs that incorporate interoperability and standards into their statistical practices will realize benefits from increased efficiency in data flows within the national statistical system and increased usability for users.

The accompanying guidelines for this principle include:

- Modularity and extensibility: National reporting platforms should be modular, and the modularity should be based on standards, such as the Statistical Data and Metadata eXchange (SDMX).
- Standardized interfaces: National reporting platforms should have standardized application programming interface (APIs), with standards based on OpenAPI Specification.

Guidance for Principle 4: Interoperability and statistical standards

There are detailed resources and guides available for NSOs to successfully incorporate interoperability and standards into their statistical products. The Collaborative on SDG Interoperability developed a guidance on data interoperability in the field of international development. Their paper, *Data interoperability: A practitioner’s guide to joining up data in the development sector*, provides a “...useful starting point for statisticians, government officials, and development practitioners responsible for data management, as well as suppliers of information and communication technologies (ICT) solutions in the development sector. ...

²⁵ <https://opensource.org/osd>

[I]nteroperability is both a characteristic of good quality data and a concept that can be used to help frame data management policies.”²⁶ Furthermore, CODE’s *Strategies for SDG National Reporting* highlights the importance of metadata and standards, such as SDMX, as key strategic considerations in making data useful for policymakers. The report also describes long-term technical strategies, such as interoperability, as a key strategic consideration for sustainability.²⁷

Country Examples for Principle 4: Interoperability and statistical standards

The most common examples of interoperability and implementation of statistical standards cited by countries in our survey were SDMX and application programming interfaces (APIs). SDMX is an “international initiative that aims at standardizing and modernizing (“industrializing”) the mechanisms and processes for the exchange of statistical data and metadata among international organisations and their member countries.”²⁸ An API is a “source code-based specification to be used as an interface by software components to communicate with each other.”²⁹

To implement modularity and extensibility in their platform design, the United Kingdom is collaborating with the Center for Open Data Enterprise (CODE) to investigate the use of SDMX in Open SDG,³⁰ an open-sources national reporting platform. Because the data and metadata for an Open SDG implementation are available at predictable and documented paths, they can be accessed programmatically. However, this feature is not widely recognized and therefore not widely used. The next step will entail testing the API feature and to provide documentation before publicizing.

Conclusion

The endorsement of the principles and guidelines for national reporting platforms within PARIS21’s NSDS guidelines could be a critical step in legitimizing these principles and guidelines. PARIS21’s NSDS guidelines have a section on implementing open data in NSDSs.³¹ The UN Statistical Commission could collaborate with PARIS21 to integrate these principles and guidelines for national reporting platforms in the existing section on open data.

Incorporating open data and interoperability into the GSBPM

This section of the background paper assesses current good practices and prospective uses of the General Statistical Business Process Model (GSBPM) from an interoperability perspective.

²⁶ <https://unstats.un.org/wiki/display/InteropGuide/Foreword>

²⁷ http://reports.opendataenterprise.org/CODE_StrategiesforSDGreporting.pdf

²⁸ https://sdmx.org/?page_id=3425

²⁹

https://www.unece.org/fileadmin/DAM/cefact/cf_forums/2019_Geneva/T_L_Standards_Strategy_From_Data_elements_to_APIs-1_April-FINAL.pdf

³⁰ <https://open-sdg.readthedocs.io/en/latest/>

³¹ <https://nsdsguidelines.paris21.org/node/530>

Interoperability is included in the International Open Data Charter’s six principles of open data³² because the value of open data increases when they can be joined and merged with other datasets to provide insight. The GSBPM “describes and defines the set of business processes needed to produce official statistics.”³³ This standardized framework and terminology facilitates statistical organisations sharing of innovative approaches to statistical compilation and dissemination. It provides a map of the activities and tasks involved in transforming input data into statistical outputs and can be used as a checklist to ensure that statistical modernization or innovation initiatives consider all relevant aspects of statistical production. The GSBPM framework can also be used to help identify data interoperability best practices that are relevant to common statistical production process across different national and international statistical organisations, so that the practices can reach a wider audience and be implemented at a larger scale. If these interoperability practices were adopted, it could have the follow-on effect of increasing the value of open data. In this section, the interoperability best practices contained in *Data interoperability: A practitioner's guide to joining up data in the development sector*³⁴ will be reviewed for their application across the ongoing-work phases of the GSBPM as a proof of concept for a possible full mapping and drafting of interoperability additions to the GSBPM.

Mapping GSBPM to interoperability standards

To incorporate interoperability into the GSBPM a clear mapping of the most relevant interoperability practices to each design phase has been completed by this working group. This product serves as a proof of concept and an entry point to consider GSBPM elements in the development of guidelines on data interoperability standards and best practices.

The GSBPM consists of eight phases: (1) Needs specification; (2) Design; (3) Build; (4) Collect; (5) Process; (6) Analyze; (7) Disseminate; and (8) Evaluate. Phases 4 to 7 could be considered as “ongoing work” phases, while phases 1-3 and 8 could be categorized as “change-work” phases. The “change-work” phases of the GSBPM focus on efforts to continuously improve the work of statistical organizations, with a view to ensure that “ongoing-work” phases use the available statistical infrastructure and other organizational resources effectively and efficiently, to transform data inputs into physical or digital statistical products that are fit-for-purpose from the perspective of the end users.

For this proof of concept on the mapping of the GSBPM to the interoperability standards, the inclusion of interoperability principles for the “ongoing work” stages (4-7) can be found at this [link](#). This mapping exercise and its findings should be used to encourage discussion on the integration of interoperability practices into the GSBPM. The GSBPM is currently being used by

³² <https://opendatacharter.net/principles/>

³³ <https://statswiki.unece.org/display/GSBPM/GSBPM+v5.1>

³⁴ <http://www.data4sdgs.org/resources/interoperability-practitioners-guide-joining-data-development-sector>

39 national statistical offices,³⁵ which would be a substantial audience if the interoperability principles were streamlined into the GSBPM. There are also benefits to adding these principles into official documents like these to help with the creation of norms for interoperability in statistical practices. If there is interest from the Friends of the Chair group, this mapping could be fleshed out in the working group's next paper to fully incorporate GSBPM components in the development of practical guidelines and recommendations for the implementation of data interoperability standards and best practices in official statistics.

Developing a culture to support open data

An open data culture is defined as the outcome of a system of organisational structures and practical applications that promote the production and use of open data by organisations. Developing a strong open data culture is an ongoing process that instills the principles of open data in the leadership and organisational realities of the NSS, in data users elsewhere in government, and in members of the public. The presence of an open data culture can only be directly measured by proxy, such as through the usage rate of an application programming interface (API), or the number of downloads of a report, or the attendance and engagement at open data workshops, or the legal enabling environment of the NSS. Surveying data practitioners is another way of gathering evidence of an open data culture. Adopting an open data culture is a transformation in thought that in turn facilitates a transformation in the practice of producing, publishing, and using data. It is thus as much a social as it is a data governance and technical challenge to overcome. It also ties together many of the other topics discussed in this brief, such as data open by default, user-centric design, and principles and guidelines for national reporting platforms. The next section will therefore focus on NSO governance through legal and institutional frameworks, internal capacity and streamlining, and external communications as three ways in which open data culture can be engendered.

Open data as more than a dissemination strategy for NSOs

As enshrined in the FPOS,³⁶ the primary role of national statistical offices is concerned with the integrity and coordination of systems for the production of statistics. However, in the face of the data revolution and the open data agenda, the mandate of NSOs and their partners within the NSS needs to reflect this new reality. As described in a background paper prepared for the 50th meeting of the U.N. Statistical Commission, “open data [...] is more than a dissemination strategy: embracing the principles of open data is an opportunity to engage with the larger world of data-driven innovation, potentially leading to economic value, cost savings, and process improvement and to demonstrate their relevance to their own governments, the private sector,

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https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.58/2018/mtg1/UNECE_CHOI_Presentation.pdf

³⁶ <https://unstats.un.org/unsd/dnss/gp/FP-Rev2013-E.pdf>

and the public at large.”³⁷ Adopting an open data culture is crucial to the development of an NSO and NSS that can answer the call of the SDGs to improve statistics that allow the world to monitor the most pressing issues of development and ensure no one is left behind. As the background paper of the 50th meeting of the U.N. Statistical Commission shows, there is a lot of overlap between the FPOS as well as the open data agenda such as the International Open Data Charter. Adopting an open data culture allows both of these frameworks to become enshrined at NSOs and their NSS partners by changing the norms governing processes from the bottom up.

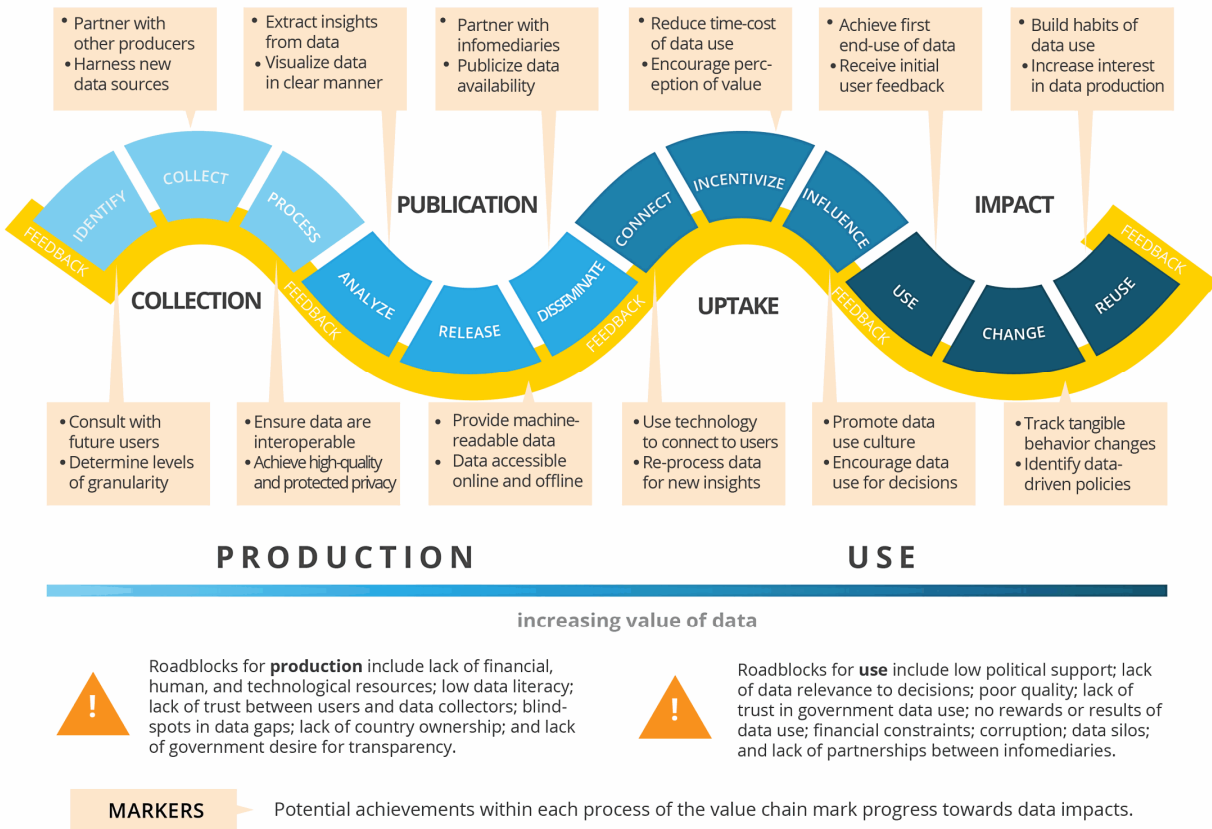
Another way to conceptualize the adoption of an open data culture and its benefits is through the idea of a data value chain.³⁸ In this framework, seen in the figure below, NSOs need to move beyond the left-hand side of the value chain. Adopting an open data culture can help move NSOs farther along the data value chain to contribute to both uptake and impact of their data.

Figure 1: Data Value Chain

³⁷ <https://unstats.un.org/unsd/statcom/50th-session/documents/BG-Item3c-Open-Data-guidance-and-mapping-to-FPOS-E.pdf>

³⁸ https://opendatawatch.com/wp-content/uploads/2018/03/Data_Value_Chain-WR-1803126.pdf

DATA VALUE CHAIN



Country examples

In order to arrive at practical guidance and illustrative country examples, Open Data Watch (ODW) conducted a desk review and survey of NSO representatives to collect information on the development of an open data culture. The survey asked respondents about:

1. Policies or legal frameworks that were developed to make open data initiatives sustainable.
2. Ways in which internal capacity of each agency to support open data were built. These cover trainings, staffing changes, funding, or changes in responsibilities/priorities.
3. Whether initiatives were implemented to encourage open data within the NSS. These cover internal competitions, working groups, or accountability initiatives.
4. Whether initiatives were implemented to encourage the use of open data by external stakeholders. These cover hackathons, feedback loops, trainings for data journalists, startup funding, and similar activities.
5. Any other relevant related insights to share.

ODW collected responses from Poland, Uzbekistan, United Kingdom, Singapore, Mongolia, Thailand, Indonesia, Hong Kong, and Georgia.

Legal and institutional enabling environment

Open data practices by NSSs are often supported by right to information and data protection laws to ensure citizens have legal access to data, while protecting their privacy. This involves coordination across ministries with similar mandates and data stewardship. NSOs in countries without such laws and mandates can organize and engage with other stakeholders in government to improve their legal enabling environment for open data culture. Other institutions can monitor and advocate for open data in countries, including networks such as the Open Government Partnership (OGP) and regional agreements. As far as this is possible within a country's legal framework, it is also possible for countries to draft their own open data charters or sign on to existing ones, such as the International Open Data Charter.³⁹ On a technical level, countries can take advantage of open data licenses that are available to classify the usability of data, as detailed in the section "Adopting an Open by Default Approach."

Changing an NSO's legal mandate is a complicated process, but powerful for streamlining responsibilities and allowing NSOs to take advantage of new opportunities in technology. Ghana has recently replaced its 35-year-old mandate,⁴⁰ giving the NSO greater control over data gathering, setting standards across the NSS, and coordinating and cooperating with international partners to further increase capacity.

Short of changing the entire apparatus of the NSS to conform to a more open data centered agenda, there are also options for ways in which existing systems can be improved through legal frameworks and coordinating agencies. For example, a number of countries are using legal mandates or programs within the NSS to create an open data culture. In Poland, the Public Data Opening Programme (PDOP) is a cross-departmental effort directed by the Ministry of Digital Affairs to develop technical standards and assist with publishing more data. In Singapore, the department of statistics adopted the Singapore Open Data License in consultation with the government of Singapore's legal department to streamline and clarify the legal disclosures and TOUs governing datasets under its administration.

Beyond technocratic interventions, NSOs can also set a thematic tone by adopting principles, either at a national or regional level that will serve as norms that will engender open data policies. For example, the following countries, among others, have set up their own open data charters: India through its National Data Sharing and Accessibility Policy 2012; Australia through its Australian Government Public Data Policy Statement 2015; and more recently the Philippines through its Open Data Philippines joint memorandum circular 2019, among others.

³⁹ <https://opendatacharter.net/principles/>

⁴⁰ <https://www.statsghana.gov.gh/aboutgss.php?category=MjkwMzA1NjI0LjE0MTU=/webstats/oq43q9p651>

Meanwhile, Indonesia is an example of a country applying an open data charter at the national level while acting regionally on open data through Association of Southeast Asian Nations (ASEAN). In the Concept Note of the ASEAN Community Statistical System Open Data Initiative for Statistics, Indonesia joined other member states in documenting common best practices for data exchange.

Guidance

To provide a legal and organisational base for an open data culture to take root, it is advised to set up coordination and collaboration mechanisms for the various stakeholders within the NSS. The following country examples show the importance of collaboration and coordination of various arms of the NSS, as well as the agenda-setting of open data principles to provide the organisational backing from which to pursue open data efforts. Examples include adopting an open data charter, either authored at the global or national level, setting up cross-departmental working groups to offer technical assistance on standards and publishing data, and working to change the mandate of the NSO itself to allow it to adopt more of the open data agenda.

Leadership, internal capacity and streamlining

Senior leadership involvement is critical to building an open data culture. Buy-in at senior levels can bring political capital and resources to NSOs seeking to adopt an open data culture.⁴¹ This buy-in can also facilitate some of the tasks required to develop a legal mandate for an open data culture, such as a review of current copyright law and other barriers to openness.

In order to socialize the principles of open data, leadership and staff can map out open data and national statistical system goals and thereby identify capacity gaps and distribute open data responsibilities. Options for increasing open data capacity include creating new positions, such as a Chief Data Officer,⁴² establishing an open data team, or adopting a more decentralized approach. Internal communication to familiarize members of the NSS with open data principles and policies is being done through data portals and trainings. For data portals too, principles exist that can help countries promote their use while delivering on NSO goals, as described in the section “Using national reporting guidelines for open data platforms” In addition, data competitions between departments and teams can be organized to further familiarize staff with the data that exist within the NSS and how to manage it in line with open data principles.

Many of the cross-departmental working groups act as open data teams rather than resting authority with only one chief data officer. These teams can also be utilized to train staff on the principles of open data. This is the case in Poland, where the PDOP instructs staff on technical standards and APIs, for example. Statistics Poland also conducts such trainings in order to increase awareness of open data among statisticians. Simultaneously a document standardizing

⁴¹ <https://stateofopendata.od4d.net/chapters/sectors/national-statistics.html>

⁴² Box 1, <https://countingontheworld.sdsntrends.org/static/files/19COTW.pdf>

and improving the construction of files that are published on the Statistics Poland website has been prepared.

The Government Statistical Service of the United Kingdom operates an Open Data Group, a subgroup to the Presentation and Dissemination Committee, which serves as a community of practice bringing together representatives from across all agencies. The group also provides a channel for sharing and learning new approaches and agreeing on a common approach to open data standards across the NSS.

Similarly, in Hong Kong, the Census and Statistics Department established an internal Statistical Information Dissemination Branch, which oversees overall data dissemination efforts and spearheads the implementation of open data policies within the department. This involves technical assistance to provide data in accessible formats, such as CSV or XML.

Guidance

Open data principles need to be socialized throughout the NSS by empowering leadership to advocate for open data trainings and regular coordination and communication efforts that will streamline open data into regular NSO processes. Leadership can be concentrated in the form of a chief data officer or in the form of a coordinating committee. If a committee structure is adopted, roles and responsibilities will need to be adjusted. This will also need to be reflected in hiring decisions that reflect the emphasis on greater data use and coordination within the NSO.

External communications to create a feedback loop for open data

To establish an open data culture the NSS needs to establish incentives and a positive feedback loop with users so that open data behaviors are reinforced and grow and transition to an open data culture is more sustainable. This feedback loop can be nurtured by adopting principles of user-centric design (as detailed in section “Incorporating a user-centric focus in open data”) to build demand for open data. As part of this process, citizens can be involved in a participatory consultative process surrounding the NSO’s data dissemination efforts. The national statistical system can also foster innovations by creating economic incentives to use their data through hackathons, contests, and funding for and collaboration with startups. Other solutions that allow external stakeholders to engage with NSO data and thereby create more demand include many of the same technical tools covered by user-centric design and the principles of national reporting platforms for open data platforms, such as publishing metadata, tools, a data publication calendar, standards, and guidance for data use, creating and maintaining APIs, hosting public workshops and trainings, providing technical assistance, and providing input for data regulations for other agencies.

Technical tools that can be used by NSOs to increase engagement with external users (as well as stakeholders in other areas of government) mainly center around APIs and other tools that enable easier use of NSO data. Statistics Poland, for example, maintains three products that utilize APIs to increase usage of data: The National Official Business Register, the National Official Register

of the Territorial Division of the Country and the Local Data Bank. The agency has also developed an R package for the LDB in order to further support public use of its data. In Singapore, the SingStat website was updated in 2018 to ensure user-friendliness, increase ease of navigation, and enhance data accessibility. To achieve these goals, features such as an API and multi-table downloads were introduced in the SingStat Table Builder.

Direct engagement with citizens and other interest groups is the most straightforward way of obtaining feedback and socializing NSO technical tools and data, as well as feeding into a positive feedback loop for more open data. This effort again owes much to user-centric design and can be applied here to continually socialize open data. For example, several countries have organized hackathons to raise awareness of open data principles and the work of the NSO regarding open data. This is the case in Uzbekistan, as well as in the United Kingdom, Mongolia, and Poland. These kinds of events encourage the public to engage with statistical data and create applications to advance a variety of goals or appeal to a certain segment of stakeholders, such as journalists. Topics of hackathons have included public sector service provision and development outcomes monitoring. Often, hackathons and other open data community events can be used by the NSO to share data with interested partners, provide insights and solicit feedback from the community in order to improve its services and products. NSOs such as ONS in the UK produce regular blog posts to support and promote new functions and offer the public several avenues for feedback, including the website and social media channels.

Guidance

It is advised to take advantage of the various tools available from user-centric design and beyond to increase access to open data both internally and externally in order to create a positive feedback loop. These include technical tools such as APIs and various data access options, as well as public engagements through hackathons, briefings, press releases, blogs, and feedback mechanisms.

Other Resources

- [Open Data for Development's State of Open Data Inventory](#)
- [Maximizing Access to Public Data: Striking the Balance Between “Open by Default” and Targeted Data Sharing](#)
- [IODC 2018 Brochure: National Reporting for the Sustainable Development Goals](#)
- [IODC 2018 PowerPoint Presentations](#)
- [Interoperability Data Collaborative](#)
- [Interoperability Guide](#)
- [UN Statistics Wiki: Data Interoperability](#)
- [SDG National Reporting Initiative](#)
- [National Platforms for SDG Reporting](#)
- [Open Data Inventory](#)
- [48th UNSC Friday Seminar on Emerging Issues: Open Data](#)

- [49th UNSD Open Data Report of the Secretary General](#)