

# FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL

## THE STATE OF OPEN DATA - FINAL TECHNICAL REPORT

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## Executive Summary

It's been 10 years since open data first broke onto the global stage. Over the past decade, thousands of programmes and projects around the world have worked to open data and use it to address a myriad of social and economic challenges. Meanwhile, issues related to data rights and privacy have moved to the centre of public and political discourse. As the open data movement enters a new phase in its evolution, shifting to target real-world problems and embed open data thinking into other existing or emerging communities of practice, big questions remain. How will open data initiatives respond to new concerns about privacy, inclusion, and artificial intelligence? And what can we learn from the last decade in order to deliver impact where it is most needed? The State of Open Data brought together over 60 authors from around the world to address these questions and to take stock of the real progress made to date across sectors and around the world, uncovering the issues that will shape the future of open data in the years to come.

Although an increasingly sophisticated network of communities has attempted to make data truly useful in addressing a range of issues facing citizens and their governments around the world, there are still many broad challenges to the realization or illustration of tangible benefits from open data programs and practices. Major challenges to advancement still include:

- difficulties in institutionalizing open data within larger sectoral initiatives without the requisite political will (many governments still indicate a reluctance or even a backlash to openness);
- a general lack of coherence and coordination across the broad open data movement - as the open data community grows in size and diversity, the activities of individual organizations and individuals need to avoid duplication and ensure the communication of lessons learned;
- a general lack of capacity - realizing the potential of open data will require solving a broader 'capacity' problem, including the creation of tools, skills development, reusable strategies, and significant investments in the IT systems and data delivery solutions are needed to facilitate use.

In order to take stock of the state of the open data global movement, this project has developed a flagship publication to examine the overall maturity of the open data movement, critically assessing its capacity to address a myriad of challenges across different sectors, regions, and stakeholder communities. The project has also sought to strengthen the capacity of the global open data community by establishing a collective knowledge base for future research, strategic planning, network and partnership development, and increased coordination and alignment.

With 37 chapters spanning all aspects of open data and contributions from 65 experts from around the world, this publication has established a fundamental research milestone, assessing the state of open data across sectors and around the world. It has also served to strengthen knowledge sharing across global and regional initiatives by serving as programme content and recommendations made at 2018 International Open Data Conference in Buenos Aires, Argentina, and more recently at the 2019 Open Government Summit in Ottawa, Canada.

## Progress Toward Milestones

Key Project Milestones as per Grant Agreement:

- Outline of SOD framework and Full chapter listing (28-32)
- Confirmation of Editorial Board membership
- Publication of Project Launch Blog
- Identification of researchers/subject matter experts for each chapter
- Completed framing briefs and guidelines to identified contributors
- Identification of key community events
- Publication of bi-monthly status and “chapter specific” blogs
- Launch of public information sharing website
- Editorial review of all chapter contributions
- Project Workshop
- Development of program recommendations to IODC 2018
- Completion of all content submitted
- SOD Presentation at IODC 2018
- Final publication of State of Open Data

Milestones and deliverables to date under the project have all been completed or exceeded.

Although all work has now been completed, there are plans in place to ensure that the publication continues to serve as a focal point for ongoing discussions within the community on the future of open data through the use of State of Open Data online resources, as well as OD4D activities throughout 2019 and 2020.

## The Research Problem

Acknowledging new as well as persistent challenges, there was an urgent need to take stock of the real progress made to date on open data in order to encourage a more evidence-based approach for future strategic open data initiatives. Given its significant research experience, the OD4D Network is uniquely positioned to identify both the challenges and opportunities related to the advancement of open data activities and communities that will in turn drive positive change in the daily lives of citizens.

Accordingly, the purpose of this project has been to critically review the current state of the open data movement and to assess its progress and effectiveness in addressing challenges related to both social and economic development, and democratization around the world. The project involved the engagement of approximately 200 different experts and contributors from across the open data community in order to develop and review thirty-seven research “chapters”, each of which is a critical reflection on the impact of open data, current practices, and the major challenges for a series of sectors, regions, or stakeholders.

Our approach to tracking the impact of open data across a wide range of potential usage areas necessitated the participation and coordination of a wide range of authors and reviewers across sectors, regions, and stakeholders. Accordingly, the core project team worked with a mix of experienced open data users, innovators, and activists in order to harness insight into the progress of open data and review past and current related activities. The result has been a straightforward stocktaking of the impact to date in an effort to identify the outstanding issues and challenges still to be addressed.

Each individual author or contributor investigated the state of open data as it pertained to a specific sector (open data community), region, or stakeholder group in order to develop a component essay or “chapter”:

- Sectors - e.g. Health, Education, Government Spending, Agriculture, Environment, International Aid, Elections, Transport, etc.;
- Regions - e.g. Africa, Asia, Eastern Europe, Latin America and the Caribbean, Middle East and North Africa, North America, Western Europe;
- Stakeholders - e.g. Governments, Civil Society, the Private Sector, Funders, Cities, Journalists, Capacity Builders, Researchers, NSOs, etc.

Although independently developed, each “chapter” addressed similar guiding questions:

- Context/key challenges;
- Main international/regional programs related to the sector/region/stakeholder;
- Evidence of outcomes from current and past efforts;
- Gender considerations/Diversity;
- Suggested considerations related to activities, finances, communications, stakeholder engagement, etc. that emerge from this analysis;
- Conclusion: overall review of current activity and impact and proposal of potential interventions, activities, or steps needed to reach the next level of maturity.

## Synthesis of Research Results

The State of Open Data project set out to explore how effective open data has been in addressing challenges related to social and economic development and to democratisation around the world. It describes the impact that open data has had in addressing these challenges, reflects on the current strengths and weaknesses of the open data movement, and sets out a series of recommendations with the goal of strengthening the future contribution of open data to sustainable and democratic development.

One of the first activities undertaken by the State of Open Data project team was to establish a strong Editorial Board to challenge all authors/contributors from the perspective of critical thinking and basis of evidence. The Board included several long standing OD4D partners, as well as a number of other open data subject matter experts.

With the establishment of the Editorial Board, the project's focus then shifted to the engagement of key actors and initiatives within the open data community that could support a critical reflection on the impact of open data to date, current practices, and the major challenges still to be addressed. We have identified and invited authors for each chapter with the intention of ensuring both expertise and a balanced representation of genders, geographic regions, and backgrounds. Authors were encouraged to bring both their own expertise and research experience, as well as their own opinions and ideas about which issues need to be addressed within their chapter; however, in order to make sure we were also tapping into the insights and wisdom of the community, there were several opportunities for broader community input into the development process.

The overall research process was as follows:

- **Step 1: Environment Scans** - Authors were invited to complete a simple template to highlight the key issues, prior research, stakeholders, events, and funders to be taken into account prior to the drafting of their chapter. The State of Open Data Project Team then provided feedback on the scan to help shape the focus of the chapter.
- **Step 2: Community Input** - The Environment Scans were then shared for public input with the goal of identifying any important gaps, additional inputs, and case studies for consideration. Input received was then provided back to chapter authors.
- **Step 3: Chapter Drafting** - Each author then completed a full draft of their respective chapter, drawing on the Environment Scan and responding to a set of guidelines provided by the project team in the form of a chapter template.
- **Step 4: Chapter Review and Revision** - Drafts were then shared with the Editorial Board and invited reviewers in order to provide constructive peer-review. Feedback was provided to authors who then made required revisions to their chapters.
- **Step 5: Final Drafting, Recommendations, and Conclusion** - Final drafts from authors formed the basis of a final editing stage by the project's senior and research editors who completed the publication and the development of conclusions and recommendations.

As outlined above, for each one of the issues, sectors, stakeholders, and regions, selected authors first prepared an Environmental Scan in order to map out the potential scope of their critical analysis of the state of the open data, identifying key stakeholders and initiatives, activities to date, existing research, etc. This work provided significant opportunities for broader community input into the project, while at the same time, serving to focus individual chapters on core research requirements. All Environmental Scans are available publicly at the [State of Open Data](#) website.

This initial work also prompted the expansion of the original research scope to include a series of cross-cutting issues that are relevant across all sectors, regions, and stakeholder chapters (eg., Privacy, Data Literacy, Data Infrastructure, etc.).

The final publication is comprised of individual chapters, each of which addresses a specific issue or thematic area of activity and provides a review of how different communities and stakeholders have pursued open data initiatives in the context of that particular issue. By drawing on diverse examples from across the globe, and highlighting both research and practice, chapters are intended to act as a key resource moving forward to inform the strategies and initiatives of policy makers, funders, practitioners, and researchers. The result is a fundamental understanding of the opportunities and challenges to leveraging open data for development and serves to identify what it is that open data initiatives will need in the future in terms of financial, material, and human support. This analysis is critical to scale innovations and strengthen networking support for global, regional, and local open data efforts around the world.

The time when a few eager pioneers dared to dream about the endless possibilities of open data is long gone. The open data community has matured and shown its value. It is here to stay, but the landscape has dramatically changed. We have seen the emergence of new data intensive technologies, the use of personal data for questionable ends, and inequality between those who can harness the power of data and those who can't. Although data can empower, we have seen how it can also promote bias, discrimination, and exclusion. As this book shows, the time has come for the open data community to rise to these challenges and deliver an inclusive, open, and bright digital future for everyone.

- Fabrizio Scrollini, Executive Director  
Open Data Latin American Initiative (ILDA)

## **Conclusions and Recommendations**

The examination of the history and horizons for open data across sixteen sectors, seven regions, and seven different stakeholder groups has provided numerous examples of open data deployed as a tool for change. Over the past 10 years, open data has become a key element of the policy toolbox and proven its value in fields as diverse as agriculture, anti-corruption, and environmental research. A proliferation of pilots and prototypes have turned into ongoing projects and initiatives, working to establish new data infrastructures for corporate governance, transparent public procurement, or monitoring progress toward the Sustainable Development

Goals (SDGs). In a number of cases, these initiatives can point to solid results, such as supporting environmental research, increasing access to healthcare, and enabling improved humanitarian coordination, to mention just a few. Yet, quantitative measurements of effectiveness have rarely been implemented. To a substantial degree, this can be attributed to a lack of research that goes beyond ad hoc case studies. Few, if any, of the open data interventions described in this report have been subject to rigorous independent and longitudinal impact evaluation, although, increasingly, decision-makers now seek this kind of robust evidence.

There is evidence that many open data communities have put a solid foundation in place for future impact, and are, in many cases, quietly creating substantive change. In a number of cases, practitioners have made rapid progress in addressing the data components of a problem space but have been much slower at converting insights gathered from the use of data into policy and operational decision-making (e.g. in 2012, open data on medical prescriptions enabled new analysis which identified the potential savings to the UK health service which could result from the effective use of generic drugs, but it took six more years to develop the tools, processes, and communication approaches needed to present this information to decision-makers for action. It is important to consider the complex contextual elements of effective open data interventions, and the time needed to secure alignment of all factors toward desired outcomes when seeking to track the extent to which open data projects are achieving impact.

The increasingly sectoral focus of open data work has provided an opportunity to strengthen collaboration between open data generalists and domain specialists. There are few contemporary social, economic, or democratic challenges where the solutions will not have at least some data component. Although it may initially appear easier to forgo openness and use data to address problems inside of organisational silos, evidence suggests that the additional effort required to incorporate effective open data approaches can create a wide range of opportunities for innovation, collaboration, and value added. The question is how best to scale up and sustain stakeholder engagement, infrastructure building, governance processes, capacity development, and cross-community networking that appear central to successful long-term open data initiatives, while not losing sight of the value of simply making data available and progressively enhancing its usability and usefulness over time. Recommendations below are provided on a number of key areas for action.

Practitioners - think politically and increase inclusion:

- Engage with the politics of data. Thinking politically involves considering the agency and agendas of those who create and use data and exploring the opportunities and constraints that affect their actions. It involves addressing collective action problems and building coalitions, recognising that there may be different ideologies and interests at play and particular data use projects may not please all stakeholders all of the time. Acting politically may, at times, involve the need to look beyond the technical quick-wins to the real change needed in the longer-term and also require a greater diversity of people and organisations to solve a given problem.
- Prioritise inclusion and equity. If work on open data is going to help deliver on the Sustainable Development Goals, it is important to build diverse and inclusive teams. This may not always be a comfortable or easy process as it may involve questioning

assumptions or creating new shared organisational cultures. Equity and inclusion involve questioning whose reality is represented within available datasets and who undertakes the labour or directs how data is used. Ultimately, every practitioner is potentially capable of sharing or distributing the power of data and data analysis in some way by taking action to support inclusion.

- Provide renewed leadership for openness. Communities and movements benefit from engaged leadership on all open data initiatives from local open data projects to global sectoral collaborations. Renewed leadership is needed to bring together technical and political agendas and ensure that the many individual open data projects working to address particular sustainable development challenges add up to more than the sum of their parts. To avoid losing its transformative potential, the open data movement of the future needs diverse leadership that, rather than being distracted by the latest technology, revisits and reinforces the core values that underlie work on open knowledge and open data.

Policy-makers - pick a problem to solve:

- Emphasis is shifting from 'open by default' to 'publish with a purpose' and to the strategic use of open data. Policy-makers are starting to understand that their role is not just to release data, but also to play an active role in governing data infrastructure, and use. Publishing with a purpose should be introduced alongside, rather than instead of, the default of 'raw data now' which can be improved over time (at least for non-privacy impacting datasets). This requires policy-makers to adopt parallel tracks of activity that embed open data approaches in problem solving. Any time an organisation is commissioning a new data system, reviewing the data it collects, or seeking to carry out data analysis, it should be able to consider: (a) the existing data it may be able to access from others; (b) whether the data to be collected and shared could be provided openly and meet common standards; and (c) the outside actors who might be engaged as partners in working with that data. This may involve taking open data ideas further out into sectoral communities in an attempt to integrate open data into domain-specific expertise.
- Maintain space for innovation and civic engagement. Many of the successful applications of open data explored in this volume, from transit apps to budget data websites and air quality monitoring platforms, were not conceived of as part of top-down policy initiatives. Instead, they emerged when interested parties identified a need and were able to discover open data that could help address it.
- Although some groundwork has been laid, the narratives that treat open data as a strategic tool for problem solving and that link open data with other areas of data policy remain underdeveloped. Policy-makers have a key role to play in promoting the integration of open data into other areas of work, while not losing sight of the simple idea that the data governments collect should, whenever possible, be shared as a resource for all citizens

Researchers - rebooting the research agenda

- Document the history of open data initiatives. Moving forward more strategically will benefit from a greater understanding of the past, particularly at the end of the first decade of open data. Studies of open data initiatives in their historical, cultural, and political contexts, that provide accessible documentation of the journey to date, can be instrumental to support reflection and learning and to enable new actors to become informed, involved, and empowered participants in the future of the open data movement.
- Compare open and non-open models. In light of the broader data agenda that has developed over the last decade, instead of asking ‘what was the impact of open data?’, research should place more of a focus on ‘how do open data strategies compare to shared data or closed data approaches in addressing sustainable development challenges?’. Methodologies should consider the potential added costs or added value of open data approaches in order to support better resources allocation decisions.
- Improve quantitative evidence through natural experiments. For example, when historical data is also made available as part of open contracting interventions, it provides an opportunity for a natural experiment, comparing procurement outcomes before and after data was openly available. Although the robust quantification of outcomes from a particular open data intervention does not provide generalisable evidence of open data impacts, it is essential for testing the null hypothesis and establishing a level of confidence in open data theories of change.

#### Funders - mainstreaming, movement building, and data literacy

- Continue to invest in a core open data movement and in shared open data infrastructures. The open data movement has yet to develop the kinds of professional associations or institutional structures that offer the potential for self-sustaining knowledge management, networking, and professional development. Even where sustainability mechanisms do emerge, developing and maintaining the inclusivity of the global open data community will require resources, as will public-good open data infrastructures that may not ever be self-funding. While funding may increasingly fall under wider ‘data rights’ or ‘digital economy’ headings, or be drawn from sectoral funding programmes, without enhanced donor coordination around open data initiatives and programmes, the full return on investments from the last decade may not be realised.
- Integrate open data approaches within sectoral funding programmes. The idea of ‘mainstreaming’ in international development funding has a mixed history. However, funding teams who have worked on directly resourcing open data work over the last decade will in the future have a larger role helping other thematic funding teams to identify the open data elements in their work. This does not mean trying to force open data into all projects, but instead should involve identifying where a project is already adopting a data-driven approach and exploring the extent to which an open data approach could enhance this. Much as governance or gender advisors have helped development-related donor programmes explore new dimensions of their work, data

and open data specialists could have a major role to play in supporting funders in the coming decade.

- Focus funding on (open) data literacy. Securing the benefits of open data, and mitigating risks associated with the abuse of data by powerful actors, requires much more widespread data literacy. Models for capacity building exist, but few have been tested at scale. Funders should set an ambitious vision for increased data literacy, both as a focus in its own right and as an element of other sustainable development projects. Fundamentally, open data literacy is not just about technical skills. It involves a critical awareness of the right to know, the power of data, and how data can be explored and questioned. As Montes and Slater state in Chapter 19: Data Literacy, the “focus should be placed on the value of openness in fighting inequality, versus focusing solely on the value of data analysis”.

## Methodology

Overall research development and editorial activities were completed as follows:

1. **Author Identification and Engagement** - Authors were identified and invited to participate with input from both The Editorial Board and OD4D Network members. Author identification was also designed to ensure both a gender and regional balance. All authors were encouraged to bring both their own expertise and research experience, as well as their own opinions and ideas about which issues need to be addressed within their chapter; however, in order to make sure we're also tapping into the insights and wisdom of the community, there have also been opportunities for public input into the development process. A total of 56 authors/contributors were identified and engaged in the writing of 37 chapters.
2. **Environment Scans** - Authors completed a template to highlight the key issues, prior research, stakeholders, events, and funders to be taken into account in the drafting of their chapter. The State of Open Data Project Team then provided feedback on the scan to each author to help shape the focus of his or her chapter.
3. **Community Input** - The Environment Scans were then shared for public input with the goal of identifying any important gaps, additional inputs, and case studies for consideration. All input received was provided back to chapter authors.
4. **Chapter Drafting** - Each author completed a first draft of his or her respective chapter based on the Environment Scan and guideline questions provided by the project team.
5. **Chapter Review and Revision** - First drafts were shared with the Editorial Board and invited reviewers to complete a peer-review process. Authors then made required revisions to their chapters.
6. **Final Chapter Drafting** - Several final drafts formed the basis of presentations and workshop sessions at the 2018 International Open Data Conference. These activities and ongoing collaboration between authors and project editors resulted in final versions of 37 distinct chapters.
7. **Development of Observations, Recommendations, and Conclusions** - reflecting on all chapters and community feedback, recommendations were developed based on the wide range of examples, organisations, and innovative ideas that illustrate open data in practice across all chapters.
8. **Development of Print and Online Resources** - The final publication of almost 600 pages has been distributed and is also available for free download or as a print publication. An intuitive online resource that includes additional data, references, and environmental scan information has also been launched at [stateofopendata.od4d.net](http://stateofopendata.od4d.net)
9. **State of Open Data Interventions and Community Activities** - As per its original objectives, the project also sought to gather and share information on key open data

activities, support improved linkages among regions, and engage new communities to help shape regional efforts through a series of small interventions. These 10 sub-projects were completed and have already had a significant impact on improving community linkages and inter-organizational collaboration on a range of open data issues:

- International Open Data Conference
  - Planning and preparation of IODC18 programme to ensure effective integration of State of Open Data output, observations, and authors.
- Open Government Partnership
  - Development of a new framework for collaboration on open data-related activities to increase knowledge sharing between the OGP and OD4D.
- Open Data Leaders Network
  - Planning and delivery of Open Data Leaders Summit at IODC18 to increase knowledge sharing on open data between government leaders.
- Data for Development (D4D)
  - Planning and delivery of NSO pre-event at IODC18 to increase knowledge sharing between NSOs and the open data community.
- Open Data Research Network
  - Open Data Research newsletters and the Open Data Research Symposium at IODC18 to increase knowledge sharing among open data researchers.
- Data Standards
  - Planning and delivery of Standards Day pre-event at IODC18 to increase knowledge sharing on open data standards development.
- Open Data and the Private Sector
  - Development of use cases for open data by the private sector to increase knowledge sharing and develop recommendations on how to strengthen private sector participation in open data in developing countries.
- Open Cities
  - Development and deployment of an Open Cities Network across 10 cities in developing countries to increase knowledge sharing on open data applications related to urban development.

## Project Outputs

1. [State of Open Data Print Publication and Website](#)
2. [Environmental Scans](#)
3. [Chapter Pre-publication](#)
4. [18 State of Open Data Blogs](#)
5. [Open Data Research Updates - Newsletter](#)
6. [Update to Impact Map](#)
7. [Multiple State of Open Data Sessions at IODC18](#)
8. [IODC18 Pre-events:](#)
  - a. National Reporting on SDGs (NSOs)
  - b. Open Cities (Open Data and Urban Development)
  - c. Open Data Leaders Summit
  - d. Open Data Research Symposium
  - e. Open Data Standards Day
9. [State of Open Data Presentations at Open Government Partnership \(OGP\)](#) Summits in both [Georgia in 2018](#) and [Ottawa in 2019](#), OD4D Summits, and the [World Data Forum 2018](#)

## **Problems and Challenges:**

The project was somewhat delayed by a combination of factors:

- logistical challenges of managing timetable exceptions for over 65 authors, especially over the summer months, against common deadlines and deliverables;
- the impact of conflicting planning efforts and deadlines associated with preparations for the International Open Data Conference which reduce the availability of authors and editors from June-September in 2018.
- there were some administrative issues as a result of staff turnover at Open North Inc responsible for financial management and reporting affecting continuity.

As a result, the reporting timeline for the project was extended to June 2018 to ensure the completion of publication, printing, and distribution of the final State of Open Data report, as well as the delivery of the final Technical and Financial Reports.

The project was completed on budget with the exception due to additional interventions totalling approximately \$2700.00. (See Final Financial Report)

## Recommendations

As we were working on the final chapter edits, we came across Catherine D'Ignazio and Lauren Klein's fantastic draft book on 'Data Feminism'. They have set out [their values for the book and a set of metrics for achieving them](#), including looking not just at authorship, but also at the diversity of citations and case studies measured against such criteria as race, gender, classism, and colonialism. We didn't quite achieve this with regard to the State of Open Data project and publication, but their work presents specific goals to pursue in future projects - doing more to track metrics throughout the writing process so that a project is able 'course correct' on a continuous basis.

Overall, we are confident that *The State of Open Data: Histories and Horizons* does contribute to a more inclusive understanding of the open data field and enable readers to discover examples, ideas, and perspectives on open data from outside the usual contexts. However, that doesn't mean the work is complete on building a more inclusive field. Our recommendations are as follows:

1. It is recommended that any ongoing work reflect a commitment to ensuring work around open data is open to new voices and that barriers to inclusion are uncovered and challenged.
2. In order to ensure a cumulative benefit from open data projects, it is recommended that projects explore the possibility of including a data literacy element into each project whether it is research, best practice, or capacity oriented.
3. It is recommended that IDRC examine the possibility of integrating an online presence for the State of Open Data into regular maintenance activities of the new OD4D Network Website in order that it can function as a continuing resource with the necessary upkeep and maintenance that would allow for periodic updates and community consultations.
4. It is recommended that programme development activities related to the International Open Data Conference 2020 in Nairobi, Kenya examine the State of Open Data resources in order to sharpen the focus of the conference themes and events and ensure the development of strategic content and cross-community collaboration.