Opinion and analysis

Islands of data: cultivating an open data landscape for sustainable development in the Caribbean

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ABSTRACT

The widespread digitization of information, advances in data processing and the emergence of internet-connected devices have led to a proliferation of data, often loosely referred to as big data. With this digital transformation, offering open data – that is, data freely available for modification and reuse – has emerged as a key strategy for encouraging transparency and innovation. Data reuse holds particular importance in the small island developing states of the Caribbean, which have a limited resource pool from which to tackle the landscape of social priorities. Efforts made towards data-sharing must consider privacy, security and the ethical use of information, and the tension between data as a social good and data for commercial gain can be a determinant of data-sharing decisions. A multidisciplinary approach is needed to realize the potential of data-sharing. In this article, we describe techniques (or pathways) for growing the Caribbean's stock of open data, classifying these into four types. Initiative pathways are techniques to broaden the range of data producers that share data. Infrastructure pathways deal with the practicalities of making data publicly available. Governance pathways are regulations and frameworks that guide data producers, including in meeting their legal data obligations. Training and communication pathways are efforts to raise awareness and knowledge about the benefits and practices of data-sharing. Data-sharing can offer a cost-effective evidence base for the Caribbean's continuing digital transformation. Sustainable sharing is key, and it must include robust technical infrastructure and governance, and ongoing communication.

Keywords   Data sharing; Caribbean region.

In an era increasingly dominated by digital transformation, the concepts of open data and big data have emerged as pivotal elements in the discourse about technological advancement and regional development (1–4). Globally, there is a growing recognition of the potential that open data holds in catalyzing economic growth, fostering transparency and driving social innovation (5, 6). In the Caribbean, the journey towards realizing the opportunities offered by open data is just beginning.

The Caribbean region is dominated by small island developing states (7). Most Caribbean islands are classified by the World Bank as middle- or high-income countries and generally score high on the United Nations Human Development Index (2022

values between 0.55 in Haiti and 0.84 in Saint Kitts and Nevis, and an average score of 0.75 across 15 territories) (8). (Additional country-level information is provided in Supplementary Table 1.) Despite these indicators, small island developing states in the Caribbean face shared environmental, economic and social vulnerabilities due to their size and geographical isolation (7). The Caribbean faces a distinct set of data-handling challenges. While industrialized countries make advances in collecting and utilizing open and big data, the Caribbean continues to have a dearth of accessible and reliable data. This scarcity is not just a technological shortfall: it reflects broader issues related to infra-structure, policy frameworks and limited practical evidence to

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show the value of data as a tool for regional development (9). The implications of this data deficit are far-reaching, impacting sectors ranging from health care and education to environmental management and economic planning. In a world where data-driven decision-making is becoming the norm, the Caribbean's progress hinges on its ability to bridge this widening digital divide.

In this article, we discuss the central role open data could play in shaping the Caribbean's future. We propose pathways to increase the availability and accessibility of open data that recognize the importance of multisectoral collaborations, the tension between data for social good and data for commercial gain, and the synergistic role of multiple pathways in facilitating open data. In doing so, we offer potential solutions to concerns surrounding completely open data sets, providing a framework that respects privacy and proprietary interests while promoting the increased flow of information. Our suggestions are high-level – that is, focusing on overarching strategies rather than delving into technical aspects of implementation. We do not provide enough practical detail for application, but nonetheless hope our strategic overview offers useful guidance for expanding the pool of data producers in the Caribbean region. Technical support in the region does exist and is increasing, and a summary of major regional initiatives is provided in Table 1. An eventual vision would be to see shared data acting as a cornerstone for regional cooperation and innovation, nudging the Caribbean towards data-driven integration and transparency.

OPEN DATA AND COMMERCIAL DATA: A FUNDAMENTAL TENSION

In the digital lexicon of the 21st century, open data and big data have become more than just buzzwords: they are catalysts of a global data revolution (10, 11). Open data refers to information that is freely available for anyone to use, modify and share, typically published by governments, international organizations and research institutions. It is characterized by its accessibility and the absence of restrictive copyright laws, enabling a fluid exchange of information. Big data refers to the exponentially growing volume of data generated by the digital activities of people and machines. It encompasses not just the quantity but also the complexity and variety of these data, which require advanced tools and analytics to process and understand. The interplay between open data and big data can be symbiotic: open data feeds into the pool of big data, providing a rich source for analysis and insights, while the tools and methodologies developed for big data enhance the utility and application of open data. Nevertheless, there is a growing recognition of big data as a commodity and, with this, the need for exclusivity to drive competitive advantage. The tension is fundamental; the idea of open data promotes widespread data accessibility to maximize public benefit, while commercial entities may seek to restrict access to data to maximize profits.

A POTENTIAL FUTURE: THE ROLE OF OPEN DATA IN REGIONAL DEVELOPMENT

The creation and use of open data infrastructure in the Caribbean can provide a substrate for regional development, acting as an evidence base for innovation, economic growth and social progress. Three theories of change support our hypothesis of open data as an enabling substrate. In economic theory, particularly the study of information asymmetry, the availability of more complete information allows for better decision-making by all stakeholders, including businesses, consumers and policymakers. Open data reduces information asymmetry, enabling more informed decisions that can stimulate economic activities, enhance market efficiencies and foster competition (12).

TABLE 1. Selected regional initiatives to promote open data and data-sharing infrastructure, Caribbean region

Initiative	Brief description	Coverage	Agency	Time frame	References
Open Data Readiness Assessment	Tool to assess readiness of a government or agency to evaluate, design and implement an open data initiative	Antigua and Barbuda, Dominican Republic	World Bank	2013–2014	(23, 38)
Open Data Projects in the Caribbean	Building three open data portals	Jamaica, Saint Lucia, Caribbean region	World Bank, United Kingdom Department for International Development	2016	(23)
Open Data Inventory	Sixth iteration of the biennial assessment of the state of official statistics globally, reporting on data openness and data coverage	15 Caribbean countries	Open Data Watch	2022–2023	(39)
Caribbean Open Institute	Open data perspectives and priorities of the small island developing states of the Caribbean region	Caribbean institute based in Jamaica; regional partner of D4D network	Caribbean Open Institute, a member of the D4D network	Ongoing	(40)
Global Data Barometer	Measures the state of data in relation to urgent societal issues	Round 1, eight Caribbean countries	D4D.net, International Development Research Centre (Canada)	Round 1 completed 2017; Round 2 ongoing	(41)
CaribData	Project operated by The University of the West Indies; online infrastructure for data collection and sharing, training in data communication, data story hub	Round 1 funding	Inter-American Development Bank	2023–2025	(42)
CARICOM Regional Strategy for the Development of Statistics	Strategic framework for national and regional statistical systems	Member states	CARICOM	2019–2030	(20)

CARICOM: Caribbean Community; D4D: Data for Development.
Source: Table developed by the authors based on their research.

According to the theory of network effects, the value of a network increases as more people use it. In the context of open data, as more data sets become available and more users engage with them, the data infrastructure itself becomes more valuable. This creates a digital commons where data can be leveraged for various regional development initiatives, enhancing collaboration and shared economic benefits (13). And the diffusion of innovations theory attempts to explain how, why and at what rate new ideas and technology spread through cultures. Open data acts as an innovation itself and also supports the diffusion of other innovations. By providing free access to data, it enables entrepreneurs and companies to develop new products and services, thereby fostering an environment conducive to creativity and technological advancement (14).

By making data freely available, governments and organizations can stimulate new research, support the development of data-driven technologies and encourage entrepreneurial ventures. This availability, in turn, can help develop and expand the digital economy, bringing economic diversification to Caribbean economies. Open data can also play a role in addressing regional grand challenges, such as climate change adaptation and disaster risk management, and ensuring healthy ageing and sustainable tourism. With access to relevant data, stakeholders can prioritize interventions and monitor their impact. Open data enhances governance and public administration by promoting transparency and accountability. Openly available government data allow for greater civic engagement and oversight, leading to more informed public discourse and decision-making, and building trust between a government and the public. In the Caribbean context, open data might also facilitate regional cooperation, with shared data resources enabling coordination to address shared challenges.

THE CARIBBEAN REALITY: A DEARTH OF OPEN DATA

The previous synopsis of open data opportunities presents an idealized future, and it is perhaps simplistic and rose-tinted, without an appreciation of the extent of the required commitment. Across the Caribbean, the journey towards a robust open data environment is marked by challenges and as-yet unexploited opportunities. Whereas in some parts of the world open data is becoming a cornerstone of governance and development, the Caribbean region lags in the creation, management and dissemination of open data, partly because small island nations have a severely limited resource pool from which to tackle social priorities (15). But this dearth of data is more than a resource shortfall; it reflects deeper systemic challenges, including limited regional collaboration in data-sharing and a lack of prioritization of data initiatives. Governments and institutions across the Caribbean region have yet to fully embrace the open data movement, potentially owing to concerns about privacy, resource allocation challenges or the perceived economic and reputational implications of freely sharing data. This hesitancy has resulted in a fragmented data ecosystem in which pockets of data exist in isolation, hindering the region's ability to form a comprehensive and cohesive data-driven strategy for development. Multiple reports have highlighted the low regional adoption of data-sharing. As long ago as 2003, the Economic Commission for Latin America and the Caribbean recognized the "high positive correlation between the status of small island and data poverty", noted that "the data poverty problem cannot be corrected by a series of successive marginal changes in peripheral policies", and that "data poverty affects large numbers of organizations and interest groups", continuing, "the [small island developing states] would be moving in the right direction if they convened a consultation on data and information management as an essential input into sound decision making and polled the viewpoints of a wide cross-section of the data using community" (16). These early comments set the scene for later evidence-gathering efforts. The United States Agency for International Development conducted a digital ecosystem country assessment for the eastern and southern Caribbean, noting in quantitative and qualitative reports the limited availability and accessibility of data (17). The fourth edition of the Open Data Barometer, produced by the World Wide Web Foundation, reported that the Caribbean remained reliant on external financing for fostering open data initiatives, struggled to sustain and scale fledgling open data initiatives and that limited government action meant that the private sector was unable to take full advantage of the opportunities offered by open data (18). Data scarcity concerns continue (19) and with ever-increasing demands on current statistical systems, the need for regional cooperation in statistics has become more urgent, beginning with the need to reinforce statistical development at the country level (20).

Moreover, the Caribbean, with its complex mix of sovereign countries and dependent territories, faces a challenging pathway to achieve a unified – or at least interconnected – data landscape. The extent of the challenge can feed inertia, yet acknowledging the situation and charting potential pathways forward are critical early steps towards enabling the Caribbean to fully participate in and benefit from the global digital economy.
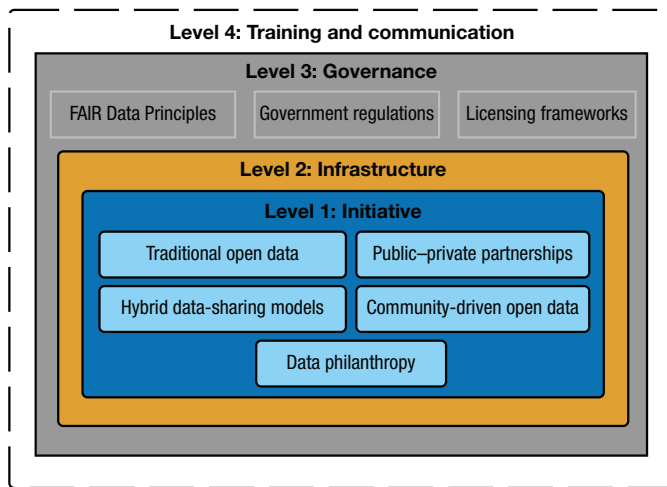
PATHWAYS TO SHARED DATA

We present a number of techniques (or pathways) for improving the region's stock of open data, classifying these pathways into four types. Initiative pathways (level 1) are techniques to encourage and broaden the range of data producers involved in data-sharing. Infrastructure pathways (level 2) deal with the practicalities of making data publicly available. Governance pathways (level 3) are regulations, policies and frameworks that guide data producers as they navigate the complexities of data-sharing, including meeting their legal data obligations and, for commercial data producers, balancing their social and financial goals. Training and communication pathways (level 4) are efforts to raise awareness and knowledge about the benefits and practices of data-sharing, along with transferring knowledge about data-handling. The pathway types are nested. By this we mean that a level 1 initiative pathway requires an associated level 2 infrastructure pathway. Initiatives and infrastructure need governance. And all three require training and communication. These pathways are described below, and their nested relationships are visualized in Figure 1.

Initiative pathways

We identify five groups of initiative pathways for encouraging data sharing, and the features of each are described below.

FIGURE 1. Schematic of pathway relationships for encouraging and facilitating regional data-sharing initiatives, Caribbean region

Level 4: Training and communication
Level 3: Governance
FAIR Data Principles — Government regulations — Licensing frameworks
Level 2: Infrastructure
Level 1: Initiative
Traditional open data — Public–private partnerships
Hybrid data-sharing models — Community-driven open data
Data philanthropy

FAIR: Findable, Accessible, Interoperable, Reusable (27).
Source: Figure developed by the authors.

Initiative pathway: traditional open data. The traditional model of open data is characterized by data mostly produced and shared by government bodies, research organizations and development agencies, such as government statistics, economic data, environmental studies and outcomes of publicly funded research projects. Data are typically made freely available to the public through online portals or databases, with the intent that data are used for a variety of purposes, including research, policy-making and application development. The data are intended to be easily accessible, enabling immediate analysis and reuse by individuals, businesses and other organizations.

One example of this type of use is the United States government's open data portal, Data.gov. Launched in 2009, Data.gov is a cornerstone of the US Open Government Initiative and the OPEN Government Data Act, offering public access to a wide range of federal data sets.

Initiative pathway: public–private partnerships. Based on a collaborative public–private agreement under which parties share responsibilities, resources and benefits, these partnerships are typically formed with the aim of enhancing public services, fostering economic development and promoting transparency. Public–private partnerships (PPPs) regularly harness private sector innovation to address public sector challenges, particularly in areas that require complex data analysis, technological solutions and innovation. PPPs can expand the scope and depth of open data available for public consumption and policy-making.

One example of this type of initiative pathway is the Health Data Research UK portal, hdruk.org. This is a United Kingdom-based partnership involving the National Health Service, universities and private companies such as Google's DeepMind. This initiative focuses on harnessing health data to advance medical research and improve patient care. The partnership emphasizes the ethical use of health data and the secure use of patient data, showcasing how sensitive health data can be shared and utilized for the greater public good while ensuring privacy and security. Transparency is being promoted with the novel concept of a data-use registry.

Initiative pathway: hybrid data-sharing models. Hybrid data-sharing models blend elements of open and proprietary data practices. In these models, a portion of a data resource, usually the more generalized or aggregated information, is made freely available to the public, while more detailed or valuable data sets remain proprietary or are provided for a fee. In this way, organizations contribute to public knowledge and societal benefits, such as research and development, public policy-making, and community projects, but at the same time, they can monetize more specific, detailed data sets, balancing public interest with commercial viability. A specific challenge is determining which data to make open and which to keep proprietary. Striking the right balance requires careful consideration of the potential impacts on business interests, privacy concerns and public benefits. Additionally, managing two different data-sharing streams can be complex, requiring robust data governance structures to ensure compliance with legal and ethical standards.

An example of this type of pathway is Google's Environmental Insights Explorer, insights.sustainability.google. Google's Environmental Insights Explorer provides a hybrid data-sharing platform through which city-specific environmental data, such as building emissions or solar potential, are made freely available to the public, particularly to aid cities in developing climate action plans. However, Google retains more detailed, granular data for internal use and for developing advanced services for which they might charge a fee, such as intricate city planning and optimization tools.

Initiative pathway: community-driven open data. Community-driven open data initiatives are grassroots efforts in which individuals, local groups or nonprofit organizations collect, compile and share data that are in the public domain. These initiatives democratize data access and empower communities by involving them directly in data collection and sharing processes. They encourage participation in open data movements by highlighting local issues and providing a platform for community voices. By harnessing the collective knowledge and resources of community members, these initiatives can fill data gaps, especially in areas where government or commercial data are lacking, outdated or non-existent. Without professional oversight, community-driven data might suffer from inconsistencies or biases. Additionally, sustaining volunteer engagement and securing funding can be difficult.

OpenStreetMap (openstreetmap.org) is a global example of a community-driven open data initiative. It is a collaborative project creating a free, editable map of the world, with data contributed by volunteers using GPS devices, aerial imagery and other free sources. OpenStreetMap is widely used for a variety of applications, from humanitarian aid to commercial services, and is a quintessential example of how community efforts can lead to rich, valuable open data resources.

Initiative pathway: data philanthropy. Data philanthropy refers to the practice through which private sector organizations, particularly large corporations, share their data resources for the public good. This involves donating or sharing proprietary data that can be used for social, humanitarian or research purposes; can inform policy-making; and can support the activities of nonprofit organizations. It is a form of corporate social responsibility through which proprietary data are used for societal benefit.

Microsoft shares its artificial intelligence (AI) tools and capabilities with researchers and organizations working in global health through its AI for Good Lab, https://www.microsoft.com/en-us/research/group/ai-for-good-research-lab/. Microsoft provides access to cloud computing resources and AI expertise to enable data analysis at scale.

Initiative pathway challenges. Most challenges are common to all pathways: (i) in practice, shared data may not always be up to date, comprehensive or presented in a format that is readily usable by the public; (ii) despite being open, shared data can sometimes be difficult to locate or access due to poor data-handling or inadequate dissemination practices; (iii) although long-term data accessibility is the ideal, sustainability generally relies on continued support and funding; (iv) ensuring data privacy and the security of shared data remain paramount, particularly when dealing with sensitive or personal information; also, ensuring that open data do not compromise individual privacy requires careful anonymization and governance; (v) encouraging meaningful data reuse requires ongoing outreach, education and, sometimes, technical support for users.

Infrastructure pathway

Open data needs a home and, usually, this has been an open data portal; although such portals are commonly built as a bespoke product, open source software is available with community support networks that can reduce the cost of ownership over time (21, 22). As a minimum, the platform should support accessibility, security, as necessary, and interoperability (and see Governance pathways). Critically, although technical implementation is straightforward, the pitfalls are more commonly centered around a lack of open data to populate the platform and a lack of institutionalized support for longer term maintenance (23).

Governance pathway: government regulations and policies

In recent years, the Caribbean has made significant strides in data governance, particularly through legislative advances aimed at bringing data protection standards in line with international best practices. Of the 15 full Caribbean Community members, 12 had active data protection legislation in place at the end of 2023, with 6 having passed legislation since 2018. Often with overseas funding support, a number of Caribbean countries are considering data governance as one part of a wider digital transformation strategy. The Caribbean Digital Transformation Project, co-funded by the World Bank Group, supports digital transformation in four eastern Caribbean countries: Dominica, Grenada, Saint Lucia, and Saint Vincent and the Grenadines (24). The Trinidad and Tobago digital transformation strategy is societal in scope and includes a comprehensive agenda for digital and open government (25). Jamaica has an ongoing national information and communication technology plan and a recent national strategy to develop a global digital services sector (26). These efforts are examples of a growing recognition across the region of the importance of digital transformation, and by extension the central role of data-driven information.

FAIR data standards. The FAIR (Findable, Accessible, Interoperable, Reusable) Data Principles have emerged as a cornerstone data-sharing framework. These principles guide the proper stewardship of data, ensuring it can be easily located, retrieved and utilized by a broad spectrum of third-party data users (27). The principles stipulate that data should be richly described and include metadata, accessible under well-defined conditions, interoperable with other data sets and reusable for an indefinite future.

Licensing frameworks. Licensing frameworks play pivotal roles in describing the terms under which data can be shared, accessed and reused. The choice of a licensing framework is critical; it defines the legal boundaries of and usage rights for data sets, influencing the extent of their dissemination and impact. These frameworks range from highly restrictive licenses, which limit use and distribution, to more permissive open licenses, like those offered by Creative Commons, which enable broader use and repurposing of data (28). The selection of an appropriate licensing model is, therefore, a balancing act between guiding data availability and maximizing utility for data users, while respecting intellectual property rights, ensuring the privacy of a participant's data and ensuring legal compliance.

Training and communication pathways

Ongoing training and communication are central to meeting the goals of any data-sharing initiative, widening the pool of potential data users and helping with effective data use and interpretation. Training should cover the rationale of the initiative and its potential impact, as well as technical, governance and legal dimensions. Well-managed communication fosters transparency, trust and collaboration. For instance, the Global Earth Observation System of Systems and the European Bioinformatics Institute both run active training and communication programs to promote their global open data infrastructure and to help users navigate the technical dimensions of their resources (29, 30). The Open Data Institute is a nonprofit organization promoting trust in data, with training being a core component of its strategy (31).

LONG-TERM DATA-SHARING: SUSTAINABILITY CONSIDERATIONS

We have described five broad groups of initiatives that can contribute to an expanded data-sharing infrastructure across the Caribbean. We see these pathways as synergistic, with each contributing to a regional data-sharing and data reuse ecosystem. For longer-term data-sharing, sustainability becomes key, and data-sharing endeavors need enabling technical infrastructures and governance frameworks, complemented by ongoing training and communication. This sustainability imperative forms an axis around which program design and implementation should revolve. Sustainability is multifaceted, encompassing technological robustness, economic viability, legal compliance and social relevance. A secure and scalable technological infrastructure should allow for adaptation to evolving data volumes and formats. Diverse funding sources are ideal, potentially including government grants, institutional support and innovative revenue models. Legal sustainability relies on compliance with changing data protection laws and ethical guidelines. For social sustainability, the initiative must remain relevant to its user community and continually engage with stakeholders by using iterative assessments of users' needs.

BEST PRACTICE OPEN DATA INITIATIVES

Government open data initiatives among industrialized nations are now common, large-scale and sustained. In the 2023 Digital Government Index produced by the Organisation for Economic Co-operation and Development, the top 10 performers were the Republic of Korea, Denmark, the United Kingdom, Norway, Australia, Estonia, Colombia, Ireland, France and Canada (32). Each country had a balanced performance in six dimensions, and these dimensions provide an important exemplar road map for aspiring nations and regions. Dimension 1, digital by design, measures how government policies are designed to enable the public sector to use digital tools and data in a coherent way when formulating policies or transforming public services. Dimension 2, data-driven, measures a government's advances in developing the governance and enablers needed for data access, sharing and reuse across the public sector. Dimension 3, government as a platform, measures the deployment of common building blocks – such as guidelines, tools, data, digital identity and software – to equip teams to advance a coherent transformation of government processes and services across the public sector. Dimension 4, open by default, measures openness beyond the release of open data, including efforts to foster the use of technologies and data to communicate and engage with different actors. Dimension 5, user-driven, measures governments' capacity to place users' needs at the core of the design and delivery of public policies and services. Dimension 6, proactiveness, measures governments' capacity to anticipate the needs of users and service providers to deliver government services proactively.

CHALLENGES FOR AN EXPANDED OPEN DATA INFRASTRUCTURE

Many barriers to open data have been identified, with much of the discourse – including the focus of this article – realistically centered around infrastructure concerns, such as funding for sustainability, the availability of human resources and the limited data resources available to facilitate an open data ecosystem (33, 34). Technical data challenges have been widely recognized, including how to harmonize data, how to understand quality and biases in individual data sources, and how to expand the currently limited expertise in developing regions to reuse open data resources (35). Less discussed but equally important are the requirements of potential stakeholders. Current open data platforms meet the technical needs of developers and data scientists but regularly lack user-friendliness for ordinary people, which is crucial for uptake. Future open data portals might adopt a person-centric, one-stop design similar to electronic government services, providing the public with easy access to data services and including tools that support social interaction among users (36, 37).

Conclusions

In the Caribbean, data-sharing initiatives are not just a matter of technological advancement. They represent one crucial component in the region's digital transformation and a step towards sustainable development and regional empowerment. Embracing open data unlocks opportunities for innovation, culturally relevant research and transparent governance. The challenges and development of associated infrastructures, while significant, are surmountable with collaborative efforts, including consideration of cross-island centralization. The journey towards a meaningful open data culture can – eventually – drive informed decision-making, foster community engagement and be an important tool for evidence-based resilience.

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REFERENCES

1. Huston P, Edge V, Bernier E. Reaping the benefits of Open Data in public health. Can Commun Dis Rep. 2019;45(10):252–6.
2. Davies T, Walker SB, Rubinstein M, Perini F, editors. The state of open data: histories and horizons. Cape Town: African Minds, International Development Resource Centre; 2019.
3. Arribas-Bel D, Green M, Rowe F, Singleton A. Open data products–a framework for creating valuable analysis ready data. J Geogr Syst. 2021;23(4):497–514.
4. Walter M, Lovett R, Maher B, Williamson B, Prehn J, Bodkin-Andrews G, et al. Indigenous data sovereignty in the era of big data and open data. Aust J Soc Issues. 2021;56(2):143–56.
5. Virkar S, Viale Pereira G. Exploring open data state-of-the-art: a review of the social, economic and political impacts. In: Parycek P, Glassey O, Janssen M, Scholl HJ, Tambouris E, Kalampokis E, et al, editors. Electronic government. Cham: Springer; 2018. p. 196–207.
6. Wiencierz C, Lünich M. Trust in open data applications through transparency. New Media Soc. 2022;24(8):1751–70.
7. MacFeely S, Peltola A, Barnat N, Hoffmeister O, Hopp D. Constructing a criteria-based classification for Small Island Developing States: an investigation. J Mar Isl Cult. 2021;10n1:155—95.
8. United Nations Development Programme. Human Development Report 2023–2024. Breaking the gridlock: reimagining cooperation

in a polarized world. New York; United Nations Development Programme; 2024.

9. Hahnel M, Smith G, Scaplehorn N, Schoenenberger H, Day L. The state of open data 2023. London: Digital Science; 2023.

10. Guglielmi S, Neumeister E, Jones N, Finnie A, Motivans A, Samman E, et al. Capturing adolescent realities in the global data revolution. Lancet Child Adolesc Health. 2022;6(11):753–5.

11. Keijzer N, Klingebiel S. Realising the data revolution for sustainable development: towards capacity development 4.0. Boulogne: Partnership for Statistics for Development in the 21st Century; 2017.

12. Fang J. Research progress of information asymmetry in recent ten years. Adv Econ Manag Polit Sci. 2023;3(1):548–54.

13. Katz M, Shapiro C. Network externalities, competition, and compatibility. Am Econ Rev. 1985;75:424–40.

14. Chandrasekaran D, Tellis GJ. Diffusion of innovation. In: Sheth J, Malhotra N, editors. Wiley international encyclopedia of marketing. 1st ed. Hoboken (NJ): Wiley; 2010: part 5.

15. McGillivray M, Naudé W, Santos-Paulino AU. Vulnerability, trade, financial flows and state failure in small island developing states. J Dev Stud. 2010;46(5):815–27.

16. Busby L. General data challenges facing the Caribbean in the context of sustainable development. Saint Lucia: Economic Commission for Latin America and the Caribbean; 2003.

17. United States Agency for International Development. Digital ecosystem country assessment: eastern and southern Caribbean. Washington (DC): USAID; 2022.

18. World Wide Web Foundation. Open Data Barometer: 2016, fourth edition [Internet]. Washington (DC): World Wide Web Foundation; 2017 [cited 2024 Apr 28]. Available from: https://opendatabarometer.org/4thedition/?_year=2016&indicator=ODB

19. Wilkinson McDaniel G. Data poverty, SDGs and coloniality in the Anglophone Caribbean. Cult Policy Manag Entrep. 2023;2(2):59–80.

20. CARICOM. Caribbean Community (CARICOM) regional strategy for the development of statistics 2019–2030 [Internet]. Georgetown (Guyana): CARICOM; 2018 [cited 2024 Apr 28]. Available from: https://caricom.org/documents/caribbean-community-caricom-regional-strategy-for-the-development-of-statistics-rsds-2019-2030/

21. Comprehensive Knowledge Archive Network. The world's leading open source data management system [Internet]. London: Open Knowledge Foundation; 2024 [cited 2024 Feb 20]. Available from: https://ckan.org/

22. DKAN: Drupal [Internet]. Berkeley (CA): Civic Actions; 2024 [cited 2024 Feb 20]. Available from: https://www.drupal.org/project/dkan

23. World Bank. World Bank support for open data: 2012–2017. Washington (DC): World Bank Group; 2017.

24. Eastern Caribbean Central Bank. Digital economy: Caribbean Digital Transformation Project [Internet]. Saint Christopher (Saint Kitts and Nevis); 2024 [cited 2024 May 23]. Available from: https://www.eccb-centralbank.org/digital-economy

25. Government of the Republic of Trinidad and Tobago. National Strategy for a DigitalTT: 2023–2026 [Internet]. Port of Spain: Ministry of Digital Transformation; 2024 [cited 2024 Feb 6]. Available from: https://mdt.gov.tt/digital-transformation-strategy/

26. Avasant. National Strategy to Develop Jamaica's global digital services sector: 2021–2025. Port of Spain: Avasant; 2022.

27. Wilkinson MD, Dumontier M, Aalbersberg IJ, Appleton G, Axton M, Baak A, et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data. 2016;3:160018.

28. Creative Commons. Better sharing, brighter future [Internet]. Mountain View (CA): Creative Commons; 2024 [cited 2024 Feb 6]. Available from: https://creativecommons.org/

29. GEO Group on Earth Observations. Earth Observations for Impact [Internet]. Geneva: Group on Earth Observations; 2024 [cited 2024 Feb 6]. Available from: https://earthobservations.org/

30. EMBL European Bioinformatics Institute. EMBL-EBI training: delivering world-class training in data-driven life sciences [Internet]. Hinxton (UK): EMBL European Bioinformatics Institute; 2023 [cited 2024 Feb 6]. Available from: https://www.ebi.ac.uk/training/

31. Open Data Institute. ODI Learning: data literacy and capability for everyone [Internet]. London: Open Data Institute; 2024 [cited 2024 Feb 19]. Available from: https://learning.theodi.org/

32. Organisation for Economic Co-operation and Development. 2023 OECD Digital Government Index: results and key findings. Paris: OECD Publishing; 2024.

33. Verma N, Gupta MP. Challenges in publishing Open Government Data: a study in Indian context. In: Proceedings of the 2015 2nd International Conference on Electronic Governance and Open Society: challenges in Eurasia. New York: Association for Computing Machinery; 2015.

34. Ahn M, Chu S. What matters in maintaining effective open government data systems? The role of government managerial capacity, and political and legal environment. In: The 22nd Annual International Conference on Digital Government Research. New York: Association for Computing Machinery; 2021.

35. Salguero-Gómez R, Jackson J, Gascoigne SJL. Four key challenges in the open-data revolution. J Anim Ecol. 2021;90(9):2000–4.

36. Ojo A, Porwol L, Waqar M, Stasiewicz A, Osagie E, Hogan M, et al. Realizing the innovation potentials from open data: stakeholders' perspectives on the desired affordances of open data environment. In: Afsarmanesh H, Camarinha-Matos LM, Lucas Soares A, editors. Collaboration in a hyperconnected world. Cham: Springer; 2016. p. 48–59.

37. Alexopoulos C, Zuiderwijk A, Charapabidis Y, Loukis E, Janssen M. Designing a second generation of open data platforms: integrating open data and social media. In: Janssen M, Scholl HJ, Wimmer MA, Bannister F, editors. Electronic government. Berlin: Springer; 2014. p. 230–41.

38. Stott A, Lewin A, Rifon-Perez A. Open data readiness assessment prepared for the Government of Antigua and Barbuda. Washington (DC): World Bank Group; 2013.

39. Open Data Watch. Monitoring [Internet]. Washington (DC): Open Data Watch; 2024 [cited 2024 Feb 19]. Available from: https://opendatawatch.com/monitoring/

40. D4D.net. D4D regional plan – Caribbean. Exploring critical issues in the use of data to address development challenges in the Caribbean [Internet]. Ottawa: International Development Research Centre, D4D; 2024 [cited 2024 Apr 27]. Available from: https://www.d4d.net/activities/d4d-regional-plan-caribbean

41. Davies T, Fumega S. Global report, first edition. Ottawa: International Development Research Centre; 2022.

42. Inter-American Development Bank. CaribData: Caribbean data-driven resilience [Internet]. Washington (DC): Inter-American Development Bank; 2024 [cited 2024 Apr 27]. Available from: https://www.iadb.org/en/whats-our-impact/RG-T4186.

Islas de datos: fomento de un entorno de datos abiertos para el desarrollo sostenible en el Caribe

RESUMEN

La digitalización generalizada de la información, los avances en el procesamiento de datos y la aparición de dispositivos conectados a internet han dado lugar a una proliferación de datos, denominados a menudo de manera general macrodatos o big data. Con esta transformación digital, la oferta de datos abiertos, es decir, datos disponibles libremente para su modificación y reutilización, ha surgido como una estrategia clave para fomentar la transparencia y la innovación. La reutilización de datos reviste especial importancia en los pequeños estados insulares en desarrollo del Caribe, que cuentan con un conjunto limitado de recursos para abordar el tema de las prioridades sociales. Los esfuerzos encaminados al intercambio de datos deben tener en cuenta la privacidad, la seguridad y el uso ético de la información, y la tensión entre los datos entendidos como un bien social y los datos utilizados con fines comerciales puede ser un factor determinante en las decisiones sobre el intercambio de datos. Se requiere un enfoque multidisciplinario para aprovechar el potencial del intercambio de datos. En este artículo describimos técnicas, o vías, para aumentar el conjunto de datos abiertos disponibles del Caribe, clasificándolas en cuatro tipos. Las vías de iniciativa son técnicas para ampliar la gama de productores de datos que los comparten. Las vías de infraestructura abordan los aspectos prácticos de la disponibilidad pública de los datos. Las vías de gobernanza son las regulaciones y los marcos que orientan a los productores de datos, incluso en el cumplimiento de sus obligaciones legales en materia de datos. Las vías de capacitación y comunicación son esfuerzos para aumentar la concientización y el conocimiento sobre los beneficios y las prácticas del intercambio de datos. El intercambio de datos puede ofrecer una base de evidencia costo-efectiva para la transformación digital continua del Caribe. La sostenibilidad del intercambio es fundamental y requiere una infraestructura técnica y una gobernanza sólidas, así como una comunicación permanente.

Palabras clave

Difusión de la información; región del Caribe.

Ilhas de dados: cultivando um ambiente de dados abertos para o desenvolvimento sustentável no Caribe

RESUMO

A digitalização generalizada de informações, os avanços no processamento de dados e o surgimento de dispositivos conectados à Internet levaram à proliferação de grandes volumes de dados, ao que se pode denominar *big data*. Com essa transformação digital, a oferta de dados abertos — ou seja, dados disponíveis gratuitamente para modificação e reutilização — surgiu como uma estratégia fundamental para incentivar a transparência e a inovação. A reutilização de dados é particularmente importante para os pequenos Estados insulares em desenvolvimento do Caribe, que dispõem de um conjunto limitado de recursos para lidar com as prioridades sociais. Os esforços direcionados ao compartilhamento de dados devem considerar a privacidade, a segurança e o uso ético das informações. A tensão entre o uso de dados como um bem social e o uso de dados para ganho comercial pode ser um fator determinante nas decisões sobre o compartilhamento de dados. É necessário adotar uma abordagem multidisciplinar para materializar o potencial do compartilhamento de dados. Neste artigo, descrevemos técnicas (ou caminhos) para ampliar o estoque de dados abertos do Caribe, classificando-as em quatro tipos: os caminhos de iniciativa são técnicas para ampliar o leque de produtores de dados que compartilham dados; os caminhos de infraestrutura lidam com os aspectos práticos da disponibilização dos dados ao público; os caminhos de governança são regulamentos e estruturas que orientam os produtores de dados, inclusive no cumprimento de suas obrigações legais em relação aos dados; e os caminhos de capacitação e comunicação são esforços para aumentar a conscientização e o conhecimento sobre os benefícios e as práticas de compartilhamento de dados. O compartilhamento de dados pode oferecer um acervo de evidências custo-efetivo para continuar a transformação digital do Caribe. O compartilhamento sustentável é fundamental e deve incluir infraestrutura técnica e governança robustas, além de comunicação constante.

Palavras-chave

Disseminação de informação; região do Caribe.