

beeckcenter social impact + innovation

O CONTRIBUTING AUTHORS

**A SCAN OF** 

# 50 Digital Public Goods

In Government Use



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## **Background**

The frequency of governments using digital public goods (DPGs) in the delivery of public services has been steadily growing across the globe in recent years. While governments and philanthropic organizations have encouraged more international use of DPGs, there is still limited awareness and utilization of DPGs in the United States, where state, territorial, and tribal governments could be benefiting from them as they replace and update digital systems for public service applications. DPGs offer governments opportunities to provide transparent, safe, trustworthy, and inclusive services; lower costs; and spur innovation.

The Beeck Center for Social Impact + Innovation at Georgetown University has launched a research agenda to support a deeper understanding of conditions shaping the delivery of digital services by U.S. state, territorial, and tribal governments, and how DPGs can help improve how those governments deliver services and engage citizens.

We created an accessible, open dataset that documents where and how 50 DPGs are being used to support delivery of public services both internationally and domestically.

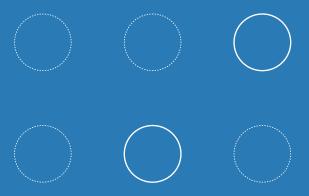
While the DPG market is far broader than this, we curated this initial list to launch our exploration into the trends and characteristics of the varied solutions available in this growing ecosystem. We started with the Digital Public Goods Alliance (DPGA) Registry for a list of publicly recognized DPGs, making sure to profile DPGs in government use that had enough documented information available for analysis. We also looked beyond the registry to find active DPGs that have documented use cases around the world. We aimed for our initial scan to include a mix, with 80 percent of DPGs recognized by the DPGA Registry and 20 percent that have not yet been profiled.

In the future, we hope to gain insight into how DPG stewards manage governance and finance their operations and explore how government executives and managers of services and IT define the characteristics of DPGs and barriers to adoption in delivery efforts.

This research initiative serves as a foundation for the Beeck Center to provide robust, evidence-based guidance that can be utilized in efforts to deliver public services at the state, local, territorial, and tribal level.



**Note:** Digital Public Goods (DPG) are open-source software, open standards, open data, open AI systems, and open content collections that adhere to privacy and other applicable best practices, do no harm, and are of high relevance for attainment of the United Nations 2030 Sustainable Development Goals (SDGs). They are designed to promote sustainable development and digital inclusion by providing tools and information that can be used, modified, and shared globally to address various societal challenges (<u>United Nations, 2020</u>). Please see the <u>glossary</u> to ensure shared context in terms.



# Research

## **Research Questions and Goals**

In building this dataset we sought to address the following questions:

Which entities successfully develop, steward, and/or share DPGs in use by governments, internationally and domestically?

Who are their target beneficiaries? Who deploys or (re)uses these DPGs successfully?

How do organizations involved in stewarding and sharing DPGs structure governance?

How do these organizations finance ongoing development and maintenance of their products?

We performed a comprehensive desk research, analyzing websites, reports, and case studies to identify DPG-sharing entities and their beneficiaries, followed by voluntary validation calls, additional review, and analysis.

We developed two key resources from this research.





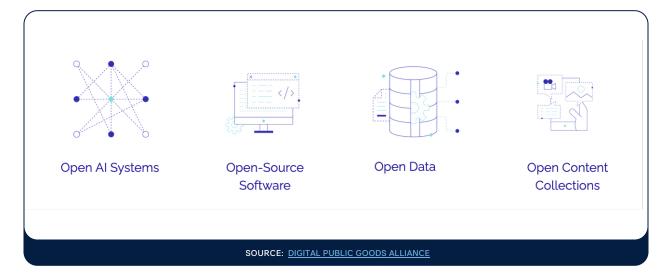
In building and releasing these resources publicly, we hope to:

- Create an easy-to-consult and updatable resource documenting the landscape of DPGs in use by governments;
- **+** Make it easier for state and territorial agencies, advocates, technology implementers, and federal agencies to understand the scope and increasing potential of DPGs in public service delivery; and
- Expand our own understanding of the trends and characteristics of the varied solutions available in the DPG market.

### Research Process and Protocol

In our comprehensive desk research we analyzed websites, reports, and case studies to pinpoint DPG-sharing entities and their beneficiaries. The review followed established literature criteria and utilized a range of databases and sources with specific keywords and search terms.

The research process unfolded in several steps. First, we initiated data collection, focusing on publicly available information about DPGs, such as open-source software, public domain datasets, and civic tech tools, including the DPG Registry created by the Digital Public Goods Alliance (DPGA). The DPGA Registry serves a critical role in the digital ecosystem by providing a curated list of DPGs that are open-source and contribute to achieving the Sustainable Development Goals. Currently, the Registry has certified at the time of publishing this report 157 open-source products as DPGs that have been vetted against <a href="minimized initial currently">nine indicators</a>, which includes having open source license(s) established, platform independence, clear ownership and documentation, etc. A subset of DPGs in the registry were identified as being in use by or for government services for our research purposes.



Next, we conducted an initial desk review to assess the collected information. In our global landscape scan, it became evident that several products currently utilized had not undergone formal DPGA certification but nonetheless met the criteria for DPG status.

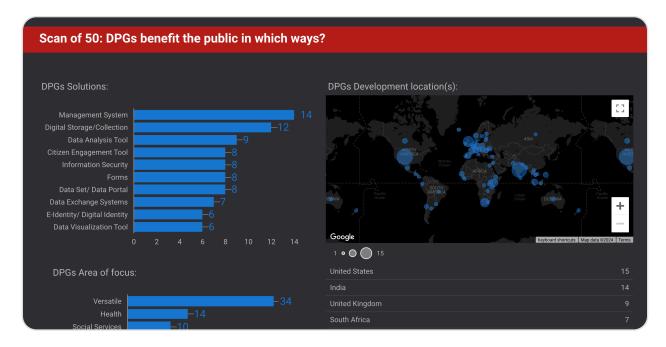
We prioritized DPGs in government use that provide data available via a desktop review and ensured appropriate inclusion of products not yet certified under the DPGA Registry. These criteria guided the selection of 50 DPGs for the initial phase of research. This was followed by validation calls or a second desk review to verify and expand on the gathered data. We conducted validation calls with developers of 27 out of the 50 highlighted DPGs from this iteration. Subsequently, the collected data was analyzed to identify recurring themes across the DPGs, which informed the findings of this final report.

The research team, led by Eve Elie and supported by Vinuri Dissanayake and Aaron Snow, conducted thorough documentation and analysis by examining DPGs that had been actively maintained within the last five years, verified through tracking of contribution histories and/or version control activities on platforms like GitHub. Participant protections were not applicable as the study relied on public information and voluntary stakeholder validation.

# Open Data

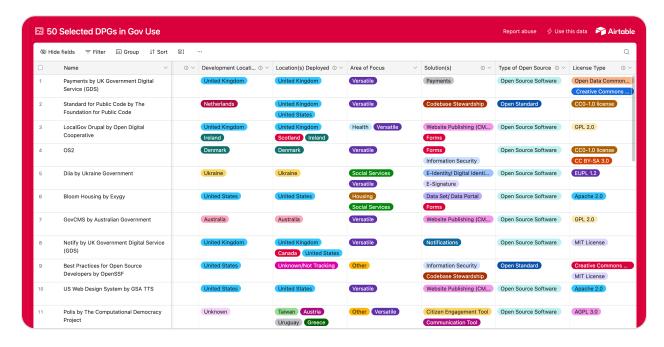
DPG Landscape Scan: <u>Dashboard</u>





DPG Landscape Scan: <u>Dataset</u>







# Key Snapshots:

- + The 50 DPGs we assessed are predominantly managed by non-profit (46%) and for-profit (26%) organizations. Non-profit DPGs in government use commonly rely on public donations, philanthropic funding, and professional service fee components. In comparison, their for-profit counterparts predominantly utilize professional service fees.
- + 36 were not made by governments but are used by governments. The remaining 14 were made for governments, by governments.
- + 16 are deployed in the U.S., seven of those 16 DPGs are deployed across 15 states. The remaining nine DPGs are not tracked or it is unknown which states are utilizing the DPG.
- + The top five locations where DPGs are deployed for government use are the United States (16), India (14), the United Kingdom (13), Germany (11), and Canada (11).
- + 14 are governed by all of the <u>recommended elements of good governance</u> as defined by Eaves et al. (2022). These elements include a codified vision, mission, and values statement; a documented code of conduct; the existence of a strategy board and technical board; and the ability to contribute to the DPG either with conditions or through open membership.

Note: We intend to work on growing the dataset every other quarter. These key snapshots pulled from the dashboard will be updated with each iteration. The insights drawn for this research are not universal to the entire DPG ecosystem but solely for the DPGs highlighted in this iteration of the landscape scan.

## **Themes**

- + There are a plethora of DPG solutions for governments to help meet the evolving expectations of citizens.
- DPGs in government use have a variety of governance structures, but common success factors are emerging.
- Membership models not only maintain DPGs fiscally over time, but drive consistent collaborative efforts.



# There are a plethora of DPG solutions for governments to help meet the evolving expectations of citizens.

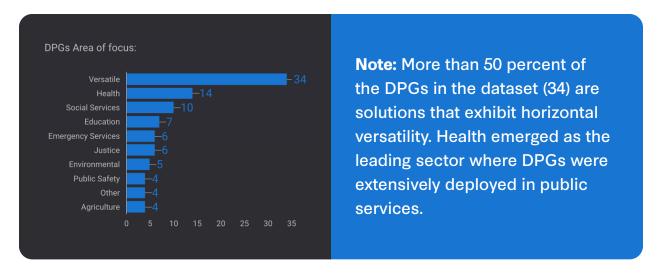
Attached Research Questions: Which entities develop, steward, and/or share DPGs in use by governments, internationally and domestically? Who are their target beneficiaries? Who deploys or (re)uses these DPGs successfully

To assess the effectiveness of DPG solutions, we examined both their targeted benefits and the specific domains or sectors where these solutions are being deployed. Our findings underscored significant variability across these dimensions within the landscape of DPGs, both in the United States and globally.

The marketplace of available DPG solutions includes a range of innovative standards, data, content, and software that can help governments improve operations and enhance public service delivery. From robust management systems to intuitive data visualization tools, DPGs are increasingly becoming pivotal in modernizing and optimizing governmental and organizational processes.

The DPGs we researched fell into two prominent subcategories: some offered specialized applications, while others were designed for multifaceted use. The first category included, for example, Mojaloop by Mojaloop Foundation, exclusively focused on building payment platforms, and Consul Democracy, which enhances digital democracy through citizen engagement. Conversely, horizontal products like Diia and Open Government Products stand out for offering versatile, single-source, open-source solutions capable of catering to multiple government service verticals.

A range of public service areas benefit from DPGs, including education and social services. Health emerged as the leading sector where DPGs were extensively deployed in public services. Notably, DPGs such as <a href="Commcare">Commcare</a> have been widely adopted by national ministries of health across multiple jurisdictions.



Finally, our validation calls helped to confirm a wide range of DPGs that exhibit domain agnosticism. More than 50 percent of the DPGs in the dataset (34) are solutions that exhibit this horizontal versatility. Deployers of such tools benefit from scalable solutions that cater to diverse organizational needs without requiring separate, sector-specific, end-to-end solutions. Examples of these versatile DPGs include <a href="X-Road">X-Road</a> (data exchange) and <a href="Open Terms Archive">Open Terms Archive</a> (database of public records).

#### **TAKEAWAYS**

As states modernize their systems, the DPG landscape presents a rich array of products that can be integrated into their environments, whether to enhance capabilities for digital identification, facilitate seamless payment processing, or optimize survey mechanisms. Furthermore, the significant cluster of domain-agnostic, versatile DPG tools offers governments opportunities to draw upon adaptable solutions that can suit diverse needs and challenges.

# DPGs in government use have a wide variety of governance structures, but some common success factors are emerging.

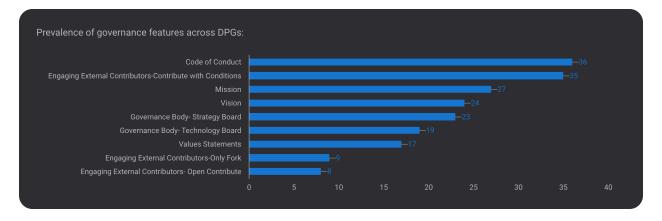
Attached Research Question: How do organizations involved in stewarding and sharing DPGs structure governance?

The governance of DPGs is challenging due to their global scope, diverse stakeholders, and complex needs for transparency, security, and sustainability. In particular, balancing openness with privacy concerns, and navigating evolving technologies and regulations, require adaptable frameworks that ensure integrity while fostering collaboration and societal benefit. Furthermore, the needs of government clients can often prove particularly challenging, with additional and tighter constraints and requirements than typical private sector clients.

To support our examination of the dataset we relied on the <u>DPG Governance Framework</u> proposed by Eaves et al. (2022). The framework identifies five recommended features for robustly governing a DPG:

- **+** The documentation of a vision, mission, and values statement for the DPG;
- The accessibility of a code of conduct that specifies how users and contributors must interact with the opensource product and its community;
- Two separate governing bodies that make decisions on the technical and strategic directions of the DPG;
- **+** The marketing and accessibility of contribution channels to help fix and improve the source code of the product; and
- The integration of stakeholder voice and representation with respect to who can make strategic decisions and how those decisions will be made.

While it is recommended that all five features coexist, the framework notes that they do not all need to be present because there are varying degrees of DPG maturity that determine the relevance of each feature. For the purpose of our review, we analyzed the dataset against the first four elements\* of the DPG Governance Framework across the 50 entities highlighted in our dataset, which revealed the following:



This analysis yielded a number of insights. There is disparate documentation of product-specific vision, mission, and value statements amongst the dataset. There were only a few examples of all three governance codes being evident and documented for DPGs. In fact, in some instances we found that the DPG's steward had documented a vision, mission, and values statement at the organization level but not at the DPG-product-specific level, the recommended codification from the DPG Governance Framework. Thirty six of 50 DPGs had a documented code of conduct; many were modeled or duplicated from the Contributor Covenant. Eighteen of 50 DPGs had the recommended two-armed governance structure of separate technical and strategic boards; approximately half of the DPGs in the dataset had no documented board structure. The majority of DPGs in the dataset (35) allow contributions with conditions, with a small number (eight) also documenting a channel for contributors to gain rights and responsibilities equal to that of members as a part of the governance model.

<sup>\*</sup> The dataset was not evaluated for stakeholder voice and representation, which we discovered necessitated a higher degree of access into board composition, information that is not available through desktop research.

#### **TAKEAWAYS**

We found that, despite the complexity of embedding governance mechanisms for DPGs, there is a robust framework that entities can use to guide this work. Governments benefit when the stewards of DPGs ensure that there is clear documentation of the public value of the DPG, and that the inherent open-source elements of the product maintain integrity, including through the documentation of a code of conduct and the ability to contribute to improving the tool. While the necessity of all elements of the DPG governance framework may vary depending on the maturity of the DPG, our research suggests that the earlier good governance is embedded, the better it is for the longevity and scalability of the DPG.

# Membership models not only maintain DPGs fiscally over time, but drive consistent collaborative efforts.

Attached Research Question: How do these organizations finance ongoing development and maintenance of their products?

The DPGs in our dataset are predominantly managed by non-profit (46%) and for-profit (26%) organizations. Our analysis reveals that non-profit DPGs commonly rely on public donations, philanthropic funding, and professional service fees, whereas for-profit DPGs predominantly utilize professional service fees.

The breakdown of the primary funding models for the DPGs we assessed are as follows:

# DPGS STEWARDED BY NON-PROFIT ORGANIZATIONS (23 OUT OF 50):

- Public Donations: 12
- + Philanthropic Funding: 10
- + Professional Service Fees: 7
- + International Organizations: 7
- + Membership: 6
- Private Funds: 5
- + Local/Municipalities: 2
- + Mixed Government: 2
- Crowdfunding Model: 1
- + State Level: 1
- + Unknown Funding Model: 1

# DPGS STEWARDED BY FOR-PROFIT ORGANIZATIONS (13 OUT OF 50):

- Professional Service Fees: 8
- International Organizations: 2
- + Unknown Funding Model: 3
- + Philanthropic Funding: 1
- + National/Federal Funds: 1
- + Private Funds: 1

DPGs in government use utilize a variety of funding models to maintain operations. The membership model in particular illustrates not only how entities sustain these initiatives through structured financial contributions, but also the consistent collaborative efforts that prioritize localized development agendas and tailored solutions.

Examples such as OS2, LocalGov Drupal by ODC, X-Road by NIIS, Mojaloop by Mojaloop Foundation, Best Practices for Open Source Developers by OpenSSF, and Mifos Payment Hub-EE (PH-EE) by Mifos, showcase various approaches for funding. For instance:

#### OS2

OS2 implements annual membership fees based on municipality population size, product-specific fees, and ad-hoc project funding from member contributions. This model ensures sustainable funding for both daily operations and larger-scale development projects, fostering shared innovation.

#### **MIFOS**

Mifos is open to technical, charitable, non-governmental, and service provider organizations.

These entities contribute through annual fees that support organizational activities and projects. X Road adjusts membership fees annually and distributes remaining assets equally among members in case of dissolution.

#### ODC

The Open Digital Cooperative, supporting the LocalGov Drupal project, sustains itself through subscription fees from councils and suppliers, supplemented by previous government department funding. This cooperative model aims to ensure financial sustainability while promoting collaboration among its members.

#### **TAKEAWAYS**

For the fiscal sustainability and scalability of DPGs created by governments, state agencies and policymakers should consider establishing non-partisan, non-profit stewardship entities with membership models. Membership models can effectively drive stakeholders to localize development agendas and tailor solutions to municipal and/or (multi)state contexts. Embracing collaborative ecosystems is not easy, but can facilitate accountability, transparency, and the equitable sharing of development gains and benefits, ensuring accessibility across stakeholders.

# Considerations for Governments Exploring DPG Adoption

Delivering outcomes for citizens requires making important decisions that impact choice, value, and quality of public service delivery. DPGs present an opportunity to transform how state agencies deliver public services by leveraging transparent, proven, shared resources and collaborative innovation.

**Impact on Choice:** DPGs offer a diverse array of solutions across various focus areas. State agencies can choose from a multitude of options, ranging from robust operating systems (KoboToolbox, OpenFn, or DHIS2) to specialized tools tailored for specific public service functions (FormsSG, LocalGov Drupal, or OpenCRVS). This diversity allows agencies to select a solution that best meets their unique needs and operational requirements, and to use that wider set of options to inform their own internal work or to supplement requirements when soliciting bids from outside vendors.

**Impact on Value:** Shared in the <u>2023 DPG Ecosystem report</u>, the UN Development Programme "continues to champion DPGs as open and interoperable solutions, which countries can safely and effectively adopt to address pressing global challenges. This includes how countries design and implement <u>Digital Public Infrastructure [DPI]</u>, where DPGs are increasingly being used to lower implementation costs and expand access to ensure no one is left behind."

The cost of delivering government technology can be significantly reduced through DPGs. By leveraging open shared resources and avoiding costly lock-in to proprietary solutions, agencies can allocate resources more efficiently, redirecting funds toward improving service delivery rather than excessive licensing, development costs, and unduly expensive change orders.

**Impact on Quality:** Adopting DPGs holds the potential to introduce a rebalancing of government/vendor relationships. Working from DPGs' open architectures and designs can help foster partnerships where vendors and agencies work together to co-create solutions. This approach not only enhances product quality but also helps ensure that solutions are continuously updated and adapted to meet evolving government needs.

## **Areas for Self-Reflection**

Our goal in building and releasing these resources publicly is to make it easier for state and territorial agencies, advocates, technology implementers, and federal agencies to understand the scope, proven track record, and increasing potential of DPGs in the delivery of public services.

When considering strategic integration of DPGs into their operations, governments can utilize the following questions to begin or continue discourse:

**Choice in Public Services Delivery:** Can we leverage the diverse array of DPG solutions to meet our unique needs and operational requirements?

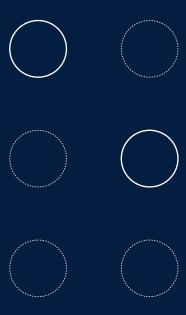
Action: Filter through the various solutions in the DPG Landscape Scan Dataset to identify suitable DPGs.

**Targeted Interventions:** Can we audit our needs against robust operating systems and specialized tools to identify targeted interventions that address municipal and/or multi-state regional needs most effectively?

Action: Utilize the DPG Landscape Scan Dataset to identify relevant interventions.

**Collaborative Ecosystems:** Are there collaborative ecosystems we can embrace to ensure accountability, transparency, and equitable sharing of development gains and benefits?

Action: Filter for Collaborative/Initiatives under Entity Type and/or Membership under Funding Models in the DPG Landscape Scan Dataset.



# Conclusion

DPGs offer a transformative opportunity for state governments to deliver public services by leveraging shared resources and collaborative innovation. These technologies can significantly impact the choice, value, and quality of public service delivery. By leveraging the insights from the Scan of 50 DPGs in Government Use report and using the DPG Landscape Scan Data Set as a tool, we hope state and territorial agencies, advocates, technology implementers, and federal agencies can enhance their discourse and strategic planning for adopting DPGs to support the delivery of public services.

# Acknowledgements

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# **Citations**

Elie, E., Dissanayake, V., Snow, A., "Scan of 50 Digital Public Goods In Government Use," Georgetown University Beeck Center for Social Impact and Innovation, October 17, 2024

# Appendix

## Sources, Keywords, and Search Terms

#### 1. General Terms

- Digital Public Goods
- DPG sharing
- DPG use, reuse, deployment instance
- Open-source digital goods
- · Civic Tech Tools

#### 2. Entities

- Government DPG initiatives
- NGO digital public goods
- Private sector DPG contributions

#### 3. Geographic Context

- International digital public goods
- US digital public goods
- Global DPG initiatives
- Domestic DPG programs

#### 4. Databases and Sources to Search

- Digital Public Goods Alliance
- GitHub repositories (for open-source DPGs)
- Open Data platforms (e.g., data.gov, open.canada.ca)
- PubMed
- · Google Scholar
- JSTOR
- IEEE Xplore
- ACM Digital

#### O EXAMPLE SEARCH QUERIES

"digital public goods" AND "open source" OR "open-source" SINCE 2020

"open source" OR "open-source" AND "public services" OR "public sector"

"Digital Public Goods" AND "sharing" AND ("reuse" OR "use" OR "deployment") AND "open source" AND ("government" OR "NGO" OR "private sector") AND ("case study" OR "report") AND ("international" OR "domestic" OR "US" OR "global") SINCE 2020

By adhering to these specific sources and search terms we can systematically capture relevant information to address the research questions effectively.

## **DPG/DPI Literature**

Abbasi, S., Haque Jami, R., & Jiisun, M. S. H. (2023). White Paper-Framework for Digital Public Goods in Least Developed Countries. Framework for Digital Public Goods in Least Developed Countries, 1-15.

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Verma, N., Lehmann, H., Alam, A. A., Yazdi, Y., & Acharya, S. (2023). Development of a Digital Assistant to Support Teleconsultations Between Remote Physicians and Frontline Health Workers in India: User-Centered Design Approach. JMIR human factors, 10, e25361. <a href="https://doi.org/10.2196/25361">https://doi.org/10.2196/25361</a>.

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Adjei-Bamfo, P., Maloreh-Nyamekye, T., & Ahenkan, A. (2019). The role of e-government in sustainable public procurement in developing countries: A systematic literature review. Resources, Conservation and Recycling. <a href="https://doi.org/10.1016/J.RESCONREC.2018.12.001">https://doi.org/10.1016/J.RESCONREC.2018.12.001</a>.

## **DPG Governance Framework Inspiration**

Eaves, D., Bolte, L., Chuquihuara Gozalo, O., & Hodigere Raghavendra, S. (2022). Best practices for the governance of digital public goods. Ash Center Policy Briefs Series.

## Glossary

Visit the Glossary with this link here shared context of definitions.

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The Beeck Center for Social Impact + Innovation at Georgetown University seeks to improve people's daily lives by helping governments utilize data, design, technology, and policy to better meet the needs of their residents. An anchor of Georgetown University's Tech and Society Initiative, the Beeck Center works alongside public, private, and non-profit organizations to identify and establish human-centered solutions that help government services work better for everyone, especially the most vulnerable and underserved populations. The Beeck Center's work was recognized on Fast Company's 2023 Next Big Things in Tech list. For more information, please visit beeckcenter.georgetown.edu.