For the People:

Tackling Government Data Interoperability Challenges with NGO Support

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i. METHODOLOGY AND ACKNOWLEDGEMENTS

At its core, the methodology of writing this paper came down to answering five questions.

- What is interoperability?
- What are the challenges or barriers to interoperability?
- Who would benefit from interoperability?
- What is the government doing to enable interoperability?
- What could be done by NGOs and philanthropy to enable interoperability?

We started with research of government documents, published articles, podcast episodes, state and organizational websites, presentations, and past interviews to understand what is happening regarding interoperability and what is being said about it. The discussions about government interoperability are as complex and diverse as the endeavor itself, making it difficult to navigate. An LLM engine was used to help synthesize the general overtones and existing concerns within the reviewed media.

In addition to research, we spoke with a wide range of government data officials and users to better understand data interoperability, its challenges, and opportunities to promote it. We extend our sincere thanks and gratitude to these individuals who generously shared their knowledge and experiences, enriching the findings of this paper.

ii. EXECUTIVE SUMMARY

Key Highlights

- Data interoperability is the backbone of modern governance, giving governments the ability to see, understand, and act on what their people are truly experiencing – turning reactive bureaucracy into proactive leadership.
- Significant barriers—outdated infrastructure, fragmented governance, workforce skill gaps, and trust and cultural challenges—must be addressed urgently.
- While federal efforts like the Federal Data Strategy (FDS) provide guidance, inconsistent progress at all levels threatens to stall momentum.
- Non-governmental organizations (NGOs) have an opportunity to lead the charge, offering essential tools, training, and governance frameworks while fostering collaboration to bridge the gaps.
- Immediate actions include advocacy to elevate the issue, training to empower a skilled workforce, and demonstrative projects to showcase the transformative potential of interoperability.

What is Data Interoperability?

Data interoperability is the ability of diverse systems to exchange and use information. It represents more than just technical integration—it is the cornerstone of effective governance. Achieving interoperability requires systems to communicate, data to be understandable by the receiving system, and meaning to be preserved across platforms. Privacy and security considerations are integral to building trust and compliance.

This is not a distant goal; it is an achievable and transformative shift that allows governments to meet the demands of a fast-moving society.

Why is it Important?

Technology has accelerated the pace of societal change, and governments must keep up. While the private sector leverages real-time data to optimize daily operations, the public sector often lags behind, hampered by siloed systems and outdated processes - except when it comes to saving lives. National defense, homeland security, the FAA, and the major push in interoperability for health care – these are the areas where we understand at a granular level

what is happening for the individual. Across the majority of the other systems, however, there is a delay that undermines the government's ability to respond effectively to the people's needs.

Interoperability is the solution. Interoperable data from the bottom up that illustrates what people are experiencing where they work, live, and raise their kids allows government to move from reactive to proactive decision-making, ensuring that services are effective, equitable, and transparent. This is the foundation of a government that works for its people—not in isolated silos, but as a unified and agile enterprise.

Current Efforts and Challenges

Efforts to achieve interoperability are underway, and progress is inconsistent. Some jurisdictions are modernizing legacy systems, while others rely on partnerships with NGOs and private-sector innovators. However, challenges persist. Privacy concerns and regulatory misalignment complicate data sharing. Cultural resistance, gaps in workforce data literacy, and fragmented governance structures further slow progress.

Federal initiatives like the Federal Data Strategy offer critical frameworks for action. Agencies, states, and local governments are in charge of leading their own implementations, however, differences in resources, priorities, and capabilities create a patchwork of progress, threatening to stall momentum and leave some communities behind.

These obstacles are not insurmountable. They are opportunities for leadership, collaboration, and innovation to bridge the gaps and build trust.

The Role of NGOs

Non-governmental organizations (NGOs) are indispensable in this mission. They serve as educators, promoting the benefits of interoperability and offering training to equip government employees with the skills needed to navigate modern data systems. NGOs develop technical solutions and governance frameworks that harmonize efforts across jurisdictions.

Most importantly, NGOs act as conveners, bringing together government agencies, private organizations, and communities to align goals and share best practices. By showcasing successful projects, they inspire confidence in what's possible and drive broader adoption. NGOs are proving that data interoperability is not just a technical ambition but a necessary transformation for a responsive, resilient government.

Call to Action

The time for action is now. Without a coordinated and urgent approach, governments risk falling further behind, unable to meet the needs of the public in a fast-changing world. Advocacy is essential to elevate data interoperability as a top priority in policy discussions and public discourse. Leaders and stakeholders must champion this cause at every opportunity.

Equally important is education. Training programs must equip the workforce at all levels of government with the skills needed to manage and optimize interoperable systems. NGOs, universities, and private organizations can lead this charge, fostering a culture of innovation and collaboration.

Finally, demonstrative projects are critical. These initiatives showcase how interoperability works in practice—horizontally across sectors and vertically from local to federal levels. Sharing successes and lessons learned from these projects will inspire trust, drive adoption, and pave the way for innovation.

Conclusion

Interoperability is the key to transforming governance. By breaking down silos, connecting systems, and enabling real-time data exchange, we can build a government that responds with agility and foresight. NGOs, in collaboration with government and private entities, are uniquely positioned to lead this charge. Together, we can create a future where the benefits of interoperability—improved services, greater transparency, and proactive governance—are realized for every citizen. The moment to act is now.

iii. GLOSSARY OF KEY CONCEPTS

Transparency v. Integration v. Interoperability

In the context of government data, these terms—data transparency, data integration, and data interoperability—represent distinct and interconnected concepts related to the collection, sharing, and use of data.

Data transparency refers to the practice of ensuring that data practices, usage, and the data itself are open, accessible, and understandable to stakeholders, which may include the public. It aims to foster trust and accountability by providing clear and accessible information about how data is collected, used, and shared.

Data integration is the process of combining data from different sources into a unified system, ensuring consistency and compatibility. This enables comprehensive analysis and insights by breaking down data silos.

Data interoperability refers to the ability of different data systems, technologies, or organizations to communicate and exchange data seamlessly. It ensures that diverse datasets can be shared and utilized efficiently across systems.

Key Differences:

Transparency: Focuses on the clarity and visibility of data practices, ensuring users understand how their data is being handled.

Integration: Aims to bring together data from various sources into a single, consistent dataset, often involving data transformation and cleaning processes.

Interoperability: Emphasizes the ability of different systems to communicate and share data without needing significant modifications or manual intervention.

The Three Levels of Interoperability [i]

Creating interoperable data systems involves multiple steps. In addition to those below, consideration for privacy and security also need to be addressed.

Foundational Interoperability is the ability of one system to exchange data with another system.

Structural Interoperability is ensuring that exchanged data is recognizable and usable by the receiving system. Data formats must be consistent and interpretable by both systems.

Semantic Interoperability ensures that the meaning of the data exchanged is preserved and understood by all systems involved.

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[i] Suitor, M. (2024, May 22). Understanding the three levels of interoperability: Foundational, structural, and semantic. Utah HIMSS. Retrieved from https://utahhimss.org/blog/id/9

Federated v. Centralized v. Hybrid Government Systems

Federated, centralized, and hybrid data systems represent distinct approaches to managing and sharing data across organizations or levels of government. Each system offers unique advantages and challenges based on how data is controlled, standardized, and integrated.

Federated systems are those in which data is decentralized, with each agency, department, or jurisdiction managing its own systems. Entities collaborate through standardized protocols to share and integrate information as needed. This approach prioritizes autonomy and flexibility, enabling customization while supporting some interoperability.

Centralized systems consolidate data into a unified system managed by a central authority, simplifying management and ensuring consistency in data collection and reporting. While more efficient for oversight and standard enforcement, they can lack flexibility and require significant investment to ensure security and manage access rights.

Hybrid systems merge federated and centralized elements, allowing local management of certain data while centralizing others for efficiency and consistency. They balance local autonomy with standardization, supporting tailored solutions, interoperability, and streamlined reporting for shared functions.

Key Differences:

Federated: Data is managed independently by local entities, offering high flexibility but minimal standardization.

Centralized: Data is fully controlled by a single authority, prioritizing standardization over flexibility.

Hybrid: Data management combines local control with centralized oversight, balancing flexibility and standardization. (e.g. the cloud, data tools, and generative AI. Today's technology allows for more hybrid systems.)

Navigating Complexity: Tackling Government Data Interoperability Challenges with NGO Support

I. Introduction

Every small to big business in the private sector that relies on integrated, real-time data to operate, successfully showcases the potential of data-driven systems to exponentially improve responsiveness and service delivery. Similarly, during crises such as the COVID-19 pandemic and natural disasters, coordinated efforts by agencies like the Centers for Disease Control (CDC), the Federal Emergency Management Agency (FEMA), and the National Oceanic and Atmospheric Administration (NOAA) demonstrate the U.S. government's capacity to effectively integrate and leverage real-time data across federal, state, and local levels. However, these instances of successful data interoperability remain isolated, as the broader landscape of government data practices is fragmented across different levels.

Achieving interoperability in government data systems is not just a technical aspiration—it is a necessity for improving public service delivery and enhancing the daily experiences of millions of Americans. When government agencies can seamlessly share and utilize data, citizens benefit through quicker access to essential services, better-informed policies, and a stronger safety net during times of crisis. In other words, data interoperability provides government the context in which people work, live, and raise their kids allowing it to have a positive impact on its people.

While federal mandates and strategies, such as the Federal Data Strategy (FDS), have aimed to increase data sharing and interoperability within government, challenges persist due to outdated technologies, governance and trust issues, and varied data literacy levels. Additionally, state and local governments lack or cannot implement unified standards to mirror federal data-sharing efforts, leading to inconsistencies. Addressing these barriers requires a comprehensive and unified approach. This paper provides an observational analysis of the main challenges to data interoperability, identifies the stakeholders affected by these issues, examines current governmental responses, and outlines potential roles for non-governmental entities in supporting the effort to create a more cohesive and integrated system.

II. A Brief Background[1]

The federal government's efforts to move towards data transparency started with federal spending back in 1921 with the establishment of what are now known as the Government Accountability Office (GAO) and the Office of Management and Budget (OMB) (*see Appendix A*). Throughout the rest of the 20th century, efforts continued to ensure accountability and tracking

of spending. However, these actions were mostly focused on *internal* accountability. It wasn't until the 21st century and the profound impact of technology that the federal government introduced

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[1] U.S. Congress, "Budget and Accounting Act of 1921," https://www.congress.gov/bill/67th-congress/house-bill/9783. U.S. Congress, "Federal Funding Accountability and Transparency Act of 2006," https://www.congress.gov/bill/109th-congress/senate-bill/2590. U.S. Congress, "Digital Accountability and Transparency Act of 2014," https://www.congress.gov/bill/113th-congress/house-bill/2061. U.S. Congress, "Foundations for Evidence-Based Policymaking Act of 2018," https://www.congress.gov/bill/115th-congress/house-bill/4174. U.S. Congress, "OPEN Government Data Act," https://www.congress.gov/bill/115th-congress/house-bill/1770. Office of Management and Budget, "Federal Data Strategy 2020 Action Plan," https://strategy.data.gov/assets/docs/2020-federal-data-strategy-action-plan.pdf.

the Federal Funding Accountability and Transparency Act (FFATA) in 2006 to track spending and make that data transparent to the public. Then, in 2014, the Digital Accountability and Transparency Act (DATA Act) standardized spending data and further pushed transparency and public access. Since 2014, multiple pieces of legislation have looked beyond spending data and pushed the needle toward more intergovernmental data sharing and interoperability. The Foundations for Evidence-Based Policymaking Act of 2019 and its subsequent OPEN Government Data Act have been the biggest push toward mandated use of data in decision making. As a result, policymakers formed the Federal Data Strategy in 2019, which officials are now implementing over a 10-year period. This strategy focuses on data standardization and interoperability across the federal government. No direct requirements were imposed on state governments, however, the FDS does provide states with resources, such as data management tools and protocols, collaborative frameworks, and access to training resources, skills development programs, and data literacy tools.

III. The Challenges of Interoperability

The progression from data accountability to transparency and, ultimately, to data sharing and interoperability has been gradual. The recent adoption of emerging AI capabilities and the increasing reliance on data have emphasized the importance of developing interoperable systems across all levels of government. Without interoperable systems, we cannot understand the impact of federal spending at the local, transactional level; we cannot shed light on critical patterns that drive better policy decisions; we cannot identify hidden barriers that prevent fair access to government programs and services. Achieving data interoperability in government systems is extremely important and requires addressing a set of deeply interconnected challenges that fall into four main categories: Trust, Leadership and Culture, Governance and Policy, Technical, and Data Literacy and Skills. Each challenge influences and is influenced by the others, creating a multifaceted problem that requires a comprehensive approach.

Trust, Leadership, and Cultural Challenges

A central barrier to data interoperability is the pervasive lack of trust among agencies, often fueled by concerns over data misuse, misinterpretation, and inconsistent representation—particularly when data flows from state to federal levels. For instance, state agencies may worry that federal officials may inaccurately represent shared data, potentially leading to misunderstandings or unintended policy consequences. Such fears entrench agencies to operate in silos to retain control over their data, inhibiting the open communication and collaboration needed for effective interoperability.

This cultural resistance to data sharing is closely tied to the influence of leadership within agencies. Leaders play a crucial role in setting the tone for data-sharing practices and can

either mitigate or reinforce these divides among staff. When leadership does not prioritize or incentivize data-sharing efforts, agencies often default to isolated practices, which further reinforces these silos. In some cases, leaders may view data management as a technical task rather than a strategic priority, leading to a reluctance to invest in interoperable systems. This can result in fragmented approaches to data sharing, where each agency maintains its own standards and practices, limiting the potential for cohesive and integrated systems.

Furthermore, limited data literacy and awareness among leaders contribute to the challenge. Leaders who lack an understanding of the strategic value of data and interoperable data systems may underfund or deprioritize initiatives that could drive efficiencies and improve decision-making. Without a clear vision of how integrated data could enhance service delivery, leaders are less likely to set expectations for collaborative data use or to model effective data-sharing practices. This knowledge gap not only perpetuates siloed operations but also leads to inconsistent implementation of data-sharing strategies across agencies.

Governance and Policy Constraints

Governance and policy constraints pose significant obstacles to data interoperability, particularly due to the fragmented structure of the U.S. government. Power is divided among federal, state, and local levels, each with distinct regulatory frameworks and requirements. This approach grants states autonomy, allowing them to set their own policies, but it also means there is no single, centralized authority overseeing or enforcing data-sharing standards across all levels of government. In the absence of a centralized "clearinghouse" coordinating these efforts, agencies often interpret and apply data-sharing policies independently, resulting in substantial variation. This variation can cause friction. For example, Statistical Policy Directive No. 15, last updated in 1997, sets the "minimum set of categories that all federal agencies and federally-funded programs are required to use if they intend to collect information on race and ethnicity."[2] However, states have the authority to divide those categories further to collect more granular data, as long as they can be aggregated into the standard categories when shared with the federal government.[3] Many states are disaggregating their race and ethnicity data categories in order to identify misrepresented citizens and gaps in services. If the state and the federal policies on race and ethnicity categories could be aligned, it would give the federal government more insight into how its policies and programs affect specific sectors of its citizenry. In addition, states would have confidence that the data it shares will be represented appropriately.

Friction can also occur in instances where more than one government policy needs to be applied. Two policies that often intersect are the Health Insurance Portability and Accountability Act (HIPAA) and the Family Educational Rights and Privacy Act (FERPA). For instance, school-based health centers may avoid sharing student health details with educators due to compliance concerns. A healthcare provider might not disclose a student's chronic condition to school officials, even though this information could enable better educational accommodations[4] FERPA creates similar challenges by restricting the sharing of

[2] Gonzalez, A. (2023). More states are pushing for race and ethnicity data equity. Center for Public Integrity. Retrieved from https://publicintegrity.org/politics/elections/who-counts/more-states-are-pushing-for-race-and-ethnicity-data-equity/

[3] The Leadership Conference Education Fund. (2023). *Disaggregation nation: How data disaggregation can advance civil rights*. Retrieved from https://civilrights.org/edfund/wp-content/uploads/sites/2/2023/12/Disaggregation-Nation.pdf

[4] School-Based Health Alliance. (2023). *Information sharing and confidentiality protection in SBHCs: A resource guide to HIPAA and FERPA*. Retrieved from https://sbh4all.org/wp-content/uploads/2023/10/Information-Sharing-and-Confidentiality-Protection-in-SBHCs-A-Resource-Guide-to-HIPAA-and-FERPA-2023.09.23-1.pdf

student education records without parental consent. This can obstruct efforts to align educational and health services for students. Understanding how FERPA and HIPAA interact is vital to overcoming these barriers and fostering compliant data-sharing practices.[5]

Privacy regulations like HIPAA and FERPA play a vital role in protecting individual rights by controlling access to sensitive information. However, their strict requirements can create barriers to data sharing, as agencies often adopt overly cautious interpretations to avoid penalties for non-compliance. This hesitation to share data can hinder interagency collaboration and limit the effectiveness of initiatives that depend on integrated information to address complex societal challenges. While data interoperability has the potential to drive innovation and improve services, the fear of violating privacy laws often prevents agencies from leveraging these opportunities.

Adding to these legal constraints are regulatory inconsistencies among federal, state, and local governments. While the OPEN Government Data Act establishes federal standards for data transparency, it does not apply to state or local entities, where policies and practices vary widely.[6] This lack of uniformity is a challenge to creating cohesive data-sharing frameworks that span multiple jurisdictions. Although standardized frameworks like the National Information Exchange Model (NIEM) promote consistent data practices, its adoption is voluntary for state and local governments.[7] As a result, not all states or localities implement NIEM, leading to variations in data standards that hinder interoperability.

These governance and policy challenges create a complex environment where agencies at state and local levels must navigate conflicting regulations and interpret policies independently, which limits the consistency and scalability of data-sharing initiatives. Without guidance or updated legal frameworks that reflect modern data needs, agencies struggle to establish a coherent and unified approach to data interoperability across government levels.

Technical Barriers

In her book, *Recoding America*[8], Jennifer Pahlka describes the effort to bring technical systems across different governments to the same operating level as akin to "archeology," a metaphor that captures the complexity of reform. Government systems and policies accumulate layers over time, with each layer reflecting decisions and priorities from different periods. Reformers, like archeologists, must carefully excavate these "fossils" of past decisions, policies, and systems—relics of different eras that have accumulated over time. This process involves understanding the original purpose of these layers, avoiding damage to the system's integrity, and addressing systemic issues at their core. For example, Pahlka

highlights the challenges faced by Healthcare.gov, where the accumulation of outdated policies and technological frameworks contributed to its initial failure. Similarly, she points to the California Employment Development Department's struggles during the COVID-19

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[5] American Academy of Pediatrics. (n.d.). *HIPAA and FERPA basics*. Retrieved from https://www.aap.org/en/patient-care/school-health/hipaa-and-ferpa-basics/

[6] U.S. Congress, "OPEN Government Data Act," https://www.congress.gov/bill/115th-congress/house-bill/1770.

[7] National Science and Technology Council. (2023). National Strategy to Advance Privacy-Preserving Data Sharing and Analytics. Office of Science and Technology Policy. Retrieved from https://www.whitehouse.gov/ostp/nstc

[8] Pahlka, J. (2023). *Recoding America: Why government is failing in the digital age and how we can do better*. St. Martin's Press.

pandemic, including delays and errors in unemployment claim processing, illustrating how antiquated systems and convoluted procedures can hamper modernization efforts. These examples demonstrate that the challenges are not only technical but also deeply rooted in a layered bureaucracy, emphasizing that modernizing government systems requires a methodical approach that accounts for the complexity and historical context within these structures. At the same time, the rapid emergence of artificial intelligence (AI) and advanced analytics requires that agencies continually invest in system upgrades to keep pace. Digging out from the past while trying to stay ahead of the future highlights why change can be slow and why quick fixes often fail.

Cybersecurity concerns further complicate the push for interoperability. Expanding data-sharing capabilities heightens the need for robust security measures to protect sensitive information from cyber threats. Balancing accessibility with stringent cybersecurity protocols, such as encryption and multi-factor authentication, creates tension, as agencies strive to establish systems that are both resilient against breaches and conducive to data sharing. This dual focus on security and interoperability can slow down the deployment of shared systems, as agencies work to meet high standards for data protection while enabling cross-agency access.

Overall, technical limitations in data interoperability are deeply intertwined and underscore the complexity of creating cohesive, interoperable data systems across government levels.

Data Literacy and Skill Gaps

Data literacy represents a critical challenge to achieving interoperability within government agencies, as it directly affects the ability of staff to understand, interpret, and effectively use data systems. Without sufficient data literacy, even agencies equipped with modern technology struggle to leverage these systems effectively. Staff may misinterpret data insights, fail to maintain data quality, or apply data incorrectly, leading to inconsistencies and fragmentation in data practices across agencies. Such inconsistencies hinder efforts to integrate data systems and align practices with broader frameworks like the FDS and the NIEM.

This gap in data literacy is particularly pronounced at the state and local levels, where resources for training and professional development are often limited. As a result, agencies in these regions may lack the capacity to fully adopt data-sharing frameworks, further widening disparities in data practices across government levels. These skill gaps also contribute to resistance toward data-sharing initiatives, as staff members may feel unprepared to implement and maintain interoperable systems.

Furthermore, the lack of data literacy impedes effective decision-making. Agencies that cannot extract meaningful insights from their data or communicate those insights clearly to inform policy are often left to rely on outdated or anecdotal methods. This limitation reduces the impact of data-driven initiatives and slows progress toward establishing interoperable systems, as staff are less equipped to engage in collaborative data-sharing efforts or support the integration of different data sources. Consequently, agencies may remain dependent on

external support[9], unable to fully develop the internal capabilities necessary to sustain interoperable systems independently.

The need for data literacy and skill-building is essential for the long-term success of interoperability initiatives. However, closing the data literacy gap is not just about technical skills—it's about empowering public servants to make informed decisions, improve service delivery, and build public trust. Efforts to expand data literacy must be supported by a cohesive governance structure, leadership commitment, and a clear regulatory framework to ensure that data literacy initiatives are effective and sustainable across all levels of government.

The challenges to achieving data interoperability are deeply complex and extend beyond those outlined here. Understanding how these barriers interconnect and influence one another is essential to developing effective strategies for overcoming them. Addressing these intricacies will be critical for advancing toward fully interoperable systems that support seamless data sharing and more informed decision-making across all levels of government.

IV. Federal, State, and Local Government Efforts to Address Interoperability Challenges

In response to the multifaceted challenges of achieving data interoperability—spanning leadership and cultural barriers, governance and policy constraints, technical limitations, and data literacy gaps—governments at the federal, state, and local levels have launched targeted efforts to address these obstacles. However, these efforts vary in scope, consistency, and success across government levels, reflecting disparities in resources, priorities, and technical capacity. In addition, the hindered abilities to data share within and among government levels results in limited to no regional sharing and collaboration across states and localities.

Federal Level

At the federal level, multiple initiatives aim to address interoperability challenges and foster a culture of data-driven governance. To address leadership and cultural challenges, the federal government established the Chief Data Officer (CDO) Council, which brings together data leaders across agencies to set best practices, encourage collaboration, and build a culture of data-sharing.[10] The Council is a significant step toward reducing siloed data practices, but the consistency of these efforts across agencies varies. Individual agencies implement these practices at different paces, influenced by resource levels and organizational priorities, which affects the Council's overall impact on fostering a collaborative data-sharing culture.

[9] A key related issue is OMB rule A-76, first issued in 1966 and revised multiple times since. A-76 outlined which tasks should be performed internally by the government and which should not. At that time, it was determined that IT support should be performed by outside contractors. The rule was suspended in 2009 by the Obama Administration due to concerns about fair and effective outsourcing practices. However, the effect of this rule has been a lack of internal technical expertise, which the government is addressing by hiring technical experts and upskilling current employees. Office of Management and Budget. (2003). Performance of commercial activities (Circular A-76, Revised) [Including technical corrections]. Retrieved from https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A76/a76_incl_tech_correction.pdf

[10] U.S. Congress. (2019, January 14). *Open, Public, Electronic, and Necessary Government Data Act (OPEN Government Data Act)*, H.R. 1770, 115th Congress.

In response to governance and policy challenges, the OPEN Government Data Act mandates data transparency and accessibility, promoting uniform data management practices across federal agencies.[11] Additionally, OMB and other federal bodies provide guidelines to align privacy regulations, such as HIPAA, with data-sharing needs, balancing security with interoperability. However, due to varying interpretations and implementations across agencies, federal frameworks often lack the cohesion necessary to harmonize practices nationwide, complicating data sharing with state and local agencies.

To overcome technical challenges, the FDS serves as a roadmap for IT modernization, emphasizing cloud adoption, compatibility with standardized data formats like NIEM, and legacy system upgrades.[12] The General Services Administration (GSA), through its Technology Transformation Services (TTS) and Data and Analytics Center of Excellence (CoE), supports agencies in modernizing infrastructure and incorporating emerging technologies.[13] However, technical upgrades vary significantly by agency, with some lagging due to budget constraints or competing priorities. This inconsistency can impede cross-agency data sharing and affects efforts to create a cohesive federal data-sharing ecosystem.

Data literacy challenges are addressed through training programs created as a result of the FDS framework, which include workshops, online courses, and toolkits aimed at enhancing data skills among federal employees.[14] The U.S. Digital Service (USDS) also offers targeted data management and analytics training, equipping federal staff with critical skills to support interoperable systems.[15] Nevertheless, the availability and reach of these programs vary, and not all agencies have the same level of access to comprehensive training, resulting in disparities in data competency across federal departments.

State Level

States serve as an essential bridge between federal initiatives and local data-sharing practices, implementing strategies that align with federal standards while addressing unique regional needs.

To overcome leadership and cultural challenges, many states have appointed CDOs or similar roles to guide data strategies and promote data-sharing practices. These leaders work to reduce silos across state domains—such as education, transportation, and public safety—by fostering interdepartmental collaboration and alignment with federal priorities. However,

[11] U.S. Congress. (2019, January 14). *Open, Public, Electronic, and Necessary Government Data Act (OPEN Government Data Act)*, H.R. 1770, 115th Congress.

[12] U.S. Federal Data Strategy. (2020). Federal Data Strategy Framework 2020. Strategy.Data.Gov. Retrieved from https://strategy.data.gov/assets/docs/2020-federal-data-strategy-framework.pdf

[13] U.S. General Services Administration. (n.d.). Technology Transformation Services (TTS). Retrieved from https://tts.gsa.gov/

[14] Office of Management and Budget. (2021, June). Data skills training program implementation toolkit (Version 1). Retrieved fro m https://resources.data.gov/assets/documents/Data_Skills_Training_Program_Implementation_Toolkit_Finalv1.pdf; Office of Management and Budget. (2020, November). Federal data strategy: Data skills catalog. Retrieved from https://resources.data.gov/assets/documents/fds-data-skills-catalog.pdf; Federal Chief Information Officers Council. (n.d.). Data science training program. Retrieved from https://www.cio.gov/programs-and-events/data-science-training-program/

[15] U.S. Digital Service. (n.d.). *United States Digital Service*. USDS.gov. Retrieved from https://www.usds.gov/

collaboration within states can sometimes be limited by resource disparities among departments, which can restrict efforts to create a unified data-sharing culture across state agencies.

In response to governance and policy challenges, many states, such as Massachusetts, have developed standardized data-sharing agreements to address privacy concerns and improve cross-agency data integration.[16] However, the proliferation of state-specific data privacy laws, with 19 states enacting comprehensive frameworks by mid-2024, has created a fragmented regulatory landscape. Laws like Maryland's Online Data and Privacy Act, Minnesota's compliance documentation mandates, and Vermont's private right of action exemplify the variability in state requirements.[17] As each state aligns its data sharing agreements with its own privacy laws, the ability to share data with the federal government or other states becomes problematic, especially if the state privacy laws are stricter than the federal. This lack of uniformity complicates efforts to align data-sharing practices with federal standards, increasing compliance challenges and operational risks for organizations operating across state lines.

States also work to address technical challenges by adopting federal interoperability frameworks where possible. For example, in Massachusetts, its Executive Office of Public Safety and Security sponsored the MassGangs project. This project created a centralized data repository for use by local, regional, and state authorities to share gang data within Massachusetts. Because the system was built using NIEM standards, it is now the basis of exchanging gang information with the state of New Jersey and serves as the foundation for Massachusetts submissions to the NCIC Gang File.[18]

In the past few years, an innovative example of overcoming a technical hurdle occurred in Montana. Its Legislative Fiscal Division leveraged trial balance sheets, which were already being used by localities, to streamline and expedite financial data collection. By integrating the submission of trial balance sheets with annual financial reporting, the state simplified reporting requirements allowing them to receive data faster and reduced the administrative burden on local staff.

In return, the state developed analytical tools and dashboards to offer insights to local governments, such as comparative spending metrics. This created a reciprocal value exchange, encouraging ongoing participation. This innovative use of trial balance sheets improved transparency and provided actionable insights into local and state finances, enabling Montana to better track financial flows and inform legislative decisions.

[16] Massachusetts Executive Office of Technology Services and Security. (n.d.). Data sharing agreements in Massachusetts. Retrieved from https://www.mass.gov/info-details/data-sharing-agreements-in-massachusetts

[17] Yannella, P. N., & Dickens, T. (2024, June 7). New state privacy laws creating complicated patchwork of privacy obligations. Reuters. Retrieved from https://www.reuters.com/legal/legalindustry/new-state-privacy-laws-creating-complicated-patchwork-privacy-obligations-2024-06-07/

[18] Bureau of Justice Assistance. (n.d.). *NIEM case studies: Unifying information exchange*. Office of Justice Programs. Retrieved from https://bja.ojp.gov/sites/g/files/xyckuh186/files/media/document/NIEM_case_studies_Unify.pdf

Data literacy initiatives at the state level are often bolstered through collaborations with academic institutions and training programs. For instance, the Statewide Longitudinal Data Systems (SLDS) Grant Program**,** administered by the U.S. Department of Education, assists states in developing data systems that enhance the ability to manage, analyze, and utilize education data.[19] However, access to these training resources can be inconsistent, particularly in smaller or rural states. A report by the Data Quality Campaign highlights that while many states have made progress in building data systems, disparities remain in data literacy training opportunities for state employees, leading to challenges in ensuring consistent data practices across state governments.[20] Additionally, the National Association of State Chief Information Officers (NASCIO) notes that only a minority of state CIOs have formal data literacy programs for their employees, underscoring the uneven access to data literacy training across different states.[21] These disparities underscore the need for more equitable access to data literacy training to ensure consistent data practices across state governments.

Local Level

Local governments play a critical role in data interoperability, but they often face significant resource constraints, which can limit their ability to participate fully in data-sharing initiatives.

To address leadership and cultural challenges, local governments rely on state-supported programs and regional collaborations to develop leadership capacity and promote data-sharing practices. Regional networks provide frameworks and best practices that encourage municipal leaders to foster data-driven governance. However, the extent to which local governments can engage in these programs varies widely, often due to limited staff and resources. This disparity can lead to inconsistent data-sharing practices across municipalities, even within the same state.

Through conversations with state leaders, it was noted that state governments provide model policies and resources to help municipalities navigate complex regulatory environments and establish compliant data-sharing practices. However, local governments can sometimes lack the legal expertise and resources to fully align their data policies with state and federal standards. It was also noted that data freedom varies widely across states, with some adopting centralized systems for data collection and management while others rely on decentralized approaches. This inconsistency creates challenges at the local level in standardization, interoperability, and national reporting.

To tackle technical challenges, local governments often depend on federal and state funding, plus grant programs to modernize outdated systems and transition to integrated platforms.

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[19] U.S. Department of Education. (n.d.). *Statewide Longitudinal Data Systems (SLDS) Grant Program*. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/slds/

[20] Data Quality Campaign. (2023, July). *Building and sustaining Statewide Longitudinal Data Systems (SLDS)*. Retrieved from https://dataqualitycampaign.org/wp-content/uploads/2023/04/DQC-SLDS-fact-sheet.pdf

[21] McCarter, M. (2024, March 27). NASCIO calls for states to implement data literacy programs. StateTech Magazine. Retrieved from https://statetechmagazine.com/article/2024/03/nascio-calls-states-implement-data-literacy-programs

Some notable programs include the American Rescue Plan Act (ARPA), which allocated $350 billion to state and local governments, providing flexibility to invest in technology infrastructure improvements. Many municipalities have utilized these funds to enhance digital services and cybersecurity measures.[22] The State and Local Cybersecurity Grant Program (SLCGP), established under the Infrastructure Investment and Jobs Act (IIJA), provides $1 billion over four years to enhance cybersecurity for state, local, and territorial governments with 80% of each state's allocation required to support local entities.[23] In addition, state governments often administer their own grant programs to assist localities in technology upgrades. For example, the Maryland Department of Housing and Community Development offers various programs, including loans, grants, and technical assistance, designed to empower communities through infrastructure improvements.[24]

While these are large dollar figures, the nationwide estimate for the total funds required remains elusive due to the diverse needs and starting points of different jurisdictions. These investments are a crucial starting point, yet they fall short in addressing the comprehensive and long-term needs of state and local governments to modernize technical infrastructure. Substantial and sustained investments are required to build resilient, secure, and scalable systems capable of serving the public effectively. It's also important to note that the demand for funding often exceeds available administrative resources. Local governments must navigate multiple grant application processes and compliance requirements to secure funding, and smaller municipalities may face challenges due to limited administrative capacities. As a result, funding at the local level remains inconsistent, and some municipalities struggle to connect with state and federal data systems effectively.

Local governments face the same funding and staffing challenges when it comes to data literacy training resulting in uneven progress across jurisdictions. Additionally, a lack of leadership buy-in and inconsistent integration of data literacy training into employee onboarding processes further hinder the widespread adoption of these programs.[25] Cities like Baltimore and San Francisco, which have recognized the need to improve data literacy and have the resources to do so, have launched targeted initiatives such as the Baltimore Data Academy and San Francisco's Data Academy, offering courses in data fundamentals, visualization tools, and interpreting open data. Baltimore's program, developed with the Bloomberg Center for Government Excellence at Johns Hopkins University (GovEx), saw over
100 employees register and 30 courses completed within two weeks of its launch.[26]

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[22] Goldstein, P. (2022, March 28). *How localities are using ARPA funds for IT modernization*. StateTech Magazine. Retrieved from https://statetechmagazine.com/article/2022/03/how-localities-are-using-arpa-funds-it-modernization

[23] Federal Emergency Management Agency. (n.d.). *State and Local Cybersecurity Grant Program: FY 2024 Fact Sheet*. FEMA. Retrieved from https://www.fema.gov/grants/preparedness/state-local-cybersecurity-grant-program/fy-24-fact-sheet

[24] Maryland Department of Housing and Community Development. (n.d.). *Programs and services*. Maryland Department of Housing and Community Development. Retrieved from https://dhcd.maryland.gov/Communities/Pages/programs/default.aspx

[25] Barrett, K., & Greene, R. (2023, December 5). Data literacy drive aims to educate public sector workforce. Route Fifty. Retrieved from https://www.route-fifty.com/workforce/2023/12/data-literacy-drive-educate-public-sector-workforce/392503/

[26] Baltimore City Mayor's Office. (2023, March 9). *City launches Baltimore Data Academy: Training program for city employees* [Press release]. Retrieved from https://mayor.baltimorecity.gov/news/press-releases/2023-03-09-city-launches-baltimore-data-academy-training-program-city-employees

San Francisco's Data Academy, relaunched after a pandemic pause, provides virtual training sessions and follow-up office hours for city staff.[27] Programs like these aim to create a data-driven culture within local governments and have seen early successes. Addressing these resource challenges is essential for ensuring equitable access to data literacy skills and fostering a culture of evidence-based decision-making at the local level.

While significant challenges remain, governments at all levels are making strides toward improving data interoperability. Federal initiatives like the FDS and the CDO Council provide a foundation for data sharing, and states are increasingly aligning with federal standards while tailoring solutions to regional needs. Local governments, though facing the greatest resource constraints, are engaging in regional networks and benefiting from state and federal support. Although true interoperability is a complex, evolving goal, these efforts demonstrate a commitment across federal, state, and local levels to overcome barriers, build capacity, and create a more integrated data-sharing ecosystem.

V. Benefits of Interoperability to the Stakeholder Ecosystem

Intergovernmental data interoperability improves coordination, decision-making, and service delivery across federal, state, and local governments. Achieving full interoperability among these levels of government would benefit a wide range of stakeholders, including government bodies, public sector agencies, educational institutions, cross-sector groups, tribal communities, and the public. The following are examples created to demonstrate that, by connecting data systems seamlessly, numerous stakeholders would gain timely, accurate, and comprehensive information that could support more effective operations and policy implementation.

Improved Policy Development and Coordination

For the White House and Congress, improved interoperability would mean quicker and more informed decision-making in areas such as economic stability, infrastructure development, and public safety. Senior policy advisors, analysts in the OMB, and the Chief Data Scientist would benefit from seamless access to integrated data, enabling the coordination of effective responses during nationwide supply chain disruptions, optimization of resource allocation, and mitigation of economic impacts. Additional benefits from having access to comprehensive federal, state, and local data would come in the assessment of federally funded programs and legislation. For instance, when evaluating the impact of workforce development initiatives, Congressional committees, legislative analysts, and staff from the Congressional Budget Office (CBO) could analyze integrated data to determine how federal job training grants influenced local employment rates and skill-building outcomes. This would ensure more precise adjustments to future legislation based on tangible community

results. Access to standardized, interoperable data also fosters collaboration and informed debates within Congress. Legislative aides, committee researchers, and policy teams would use accurate and current data to ground policies in evidence, reducing partisan gridlock and improving the legislative process.

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[27] Barrett, K., & Greene, R. (2023, December 5). Data literacy drive aims to educate public sector workforce. Route Fifty. Retrieved from https://www.route-fifty.com/workforce/2023/12/data-literacy-drive-educate-public-sector-workforce/392503/

Strengthened State and Local Public Administration

At the state and local levels, government agencies could streamline access to comprehensive, up-to-date information from federal and local entities through interoperable data systems. This means ensuring the right information reaches decision-makers tackling challenges like workforce development and economic growth. Governors, cabinet secretaries, and CDOs could leverage integrated data for strategic planning and policy implementation, while state economic development agencies, led by Economic Development Directors and program administrators, could assess regional indicators such as employment rates, business growth, and investment trends. By connecting data from industries, employers, schools, and government agencies, leaders can identify opportunities for targeted interventions, such as workforce training programs or business incentives, boosting economic resilience and fostering sustainable growth. For example, knowing which industries are expanding, which skills are in demand, and where training gaps exist helps align programs with real-world needs.

Emergency Management Coordinators and public safety officials could similarly benefit by accessing real-time data from neighboring counties and federal agencies to enhance coordination during natural disasters or large public events. This leads to improved readiness and faster response times, ensuring community safety. Urban planners and local government administrators could use interoperable data from housing, public works, and environmental agencies to develop efficient zoning laws and sustainable city plans, addressing population growth and infrastructure demands with greater foresight.

Sector-Specific Advancements

Healthcare providers, including hospitals and clinics, would benefit from interoperable data by integrating public health, environmental, and community data to enhance patient care coordination and manage resources effectively. Hospital administrators, clinical data managers, and public health officials could access real-time data on local emergency room capacities, ambulance routing, and nearby medical facilities' availability to streamline patient transfers and reduce wait times, improving overall healthcare outcomes.

For educational institutions, such as universities and schools, interoperable government data would provide seamless access to integrated demographic and workforce data. University deans, curriculum planners, and career services directors could dynamically adjust programs and curricula based on up-to-date labor market information, aligning education with regional economic needs. District superintendents and school administrators could also use this data to tailor K-12 educational offerings to community priorities.

Cross-sector groups, including interagency working groups and public-private partnerships, would gain significant advantages from interoperability for enhanced collaboration. For example, emergency response coordinators, utility managers, and technology project leads could use integrated data to coordinate power restoration, emergency response logistics, and public communications during large-scale power outages or severe weather events. These collaborations would enhance disaster resilience and service delivery efficiency across sectors.

Culturally Informed Service Delivery

Improved interoperability could help merge standard data with culturally specific data, which would enhance service delivery for tribal governments and Indigenous communities. Tribal leaders, cultural preservation officers, and community educators could use integrated language data to support accessible communications and education, preserving endangered languages and reinforcing cultural heritage. Healthcare administrators and community health workers could benefit from traditional practices data by aligning modern medical records with holistic care that respects cultural beliefs and traditions, improving health outcomes and patient trust. Similarly, social service coordinators and genealogical researchers could use interoperable systems to incorporate genealogical data, reflecting family structures tied to ancestral territories, fostering a sense of community belonging and continuity.

Educational programs would benefit from combining state data with traditional teachings, allowing school administrators and curriculum developers to reinforce Indigenous heritage alongside academic goals. By aligning standard service data with cultural specifics, interoperable systems could empower tribal program managers and data officers to strengthen community bonds, support cultural identity, and deliver services that are more relevant and impactful for Indigenous communities.

Direct Benefits to the General Public

For individual citizens, improved data interoperability could translate into more personalized, efficient, and transparent public services. Caseworkers, social service administrators, and tax agency representatives would benefit from reduced manual workloads and faster data processing, enabling them to provide more timely and accurate assistance. For residents applying for social services such as housing assistance, unemployment benefits, Social Security, or filing taxes, interoperable systems could eliminate delays caused by fragmented data systems requiring repeated submissions of the same information. Citizens would experience a streamlined application process where data shared securely across government platforms ensures faster eligibility checks and processing. This reduction in wait times and redundant paperwork would make interactions with government services easier and more user-friendly, increasing trust in government systems as citizens see their needs met promptly and effectively.

Furthermore, imagine if citizens didn't need to *pull* information from government, but that government *pushed* information to its citizens. For example, when a loved one who served in the military dies, the Veteran's Administration (VA) could reach out to the family upon

being notified of the death by the state's vital records office. This family could receive personalized
information about how their benefits will change, along with other benefits they could apply for like reimbursement for burial costs and surviving spouse payments.

With advanced data integration and interoperability, neighborhoods could benefit from a transparent, interconnected safety and mobility network that combines data from transportation services, crime reports, weather forecasts, school schedules, and real-time pedestrian movement sensors. By providing residents with safer walking or biking routes based on live crime data, streetlight outages, and traffic patterns—while also adjusting for

weather conditions—this system could showcase government's proactive role in improving daily life. City planners and public safety officers could leverage aggregated data to identify high-risk areas and prioritize visible improvements, such as installing additional lighting or rerouting traffic, fostering a sense of safety and accountability in their communities. School administrators and crossing guard coordinators could use real-time updates on bus delays, crossing guard availability, or road closures to ensure safer commutes for students, demonstrating a commitment to family well-being.

For seniors and individuals with mobility challenges, the system could provide personalized alerts about elevator outages at subway stations or disruptions to bus services, offering alternative routes or coordinating local transportation assistance. Transit officials could optimize routes and allocate resources more effectively based on localized needs, creating a reliable and accessible transportation experience. During emergencies, such as severe weather, fires, or lockdowns, emergency response coordinators could use the system to notify residents of evacuation routes, direct traffic flow, and pinpoint accessible entry points for first responders, strengthening public confidence in government preparedness and responsiveness.

By empowering residents with timely, tailored information through mobile apps or community notification systems, the government could demonstrate its commitment to transparency and proactive service delivery. Interoperable data systems could not only create a more connected, responsive, and secure community environment but also build trust by showing that government decisions are based on accurate, accessible data and are designed to meet the real-time needs of its citizens.

Interoperable data systems have the potential to revolutionize the stakeholder ecosystem by breaking down silos, enhancing collaboration, and delivering more efficient, targeted, and culturally responsive services. From improving policy development and economic resilience to empowering tribal communities and transforming public services, the benefits span every level of government and extend directly to the public.

VI. Non-Government Stakeholder Efforts to Support Data Interoperability

Non-government organizations (NGOs) play a crucial role in supporting efforts to enhance data interoperability across all levels of government. By addressing the interconnected challenges of trust, leadership, and cultural barriers; governance and policy constraints; technical limitations; and data literacy gaps, these organizations provide essential resources, expertise, and advocacy to bridge gaps that governments alone cannot fill.

Trust, Leadership, and Cultural Challenges

NGOs address issues of trust and cultural resistance by fostering leadership and promoting collaborative cultures. The National Civic League, for instance, supports municipal governments through its All-America City Awards program, which emphasizes the importance of cross-sector collaboration and data-sharing initiatives to solve community challenges. [28]

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[28] National Civic League. (n.d.). All-America City Award. Retrieved from https://www.nationalcivicleague.org/america-city-award/

This program encourages municipalities to engage residents, businesses, and non-profits in addressing critical issues, demonstrating the potential of collaborative governance.[29] Similarly, the Aspen Institute's Center for Urban Innovation works with city leaders to cultivate data-sharing cultures by highlighting the benefits of open data in improving public services.[30] These initiatives are further complemented by the Sunlight Foundation's extensive efforts to increase transparency and build public trust. With resources like the Open Data Policy Guidelines and the Open Data Policy Hub, the foundation provides governments with actionable steps to proactively release data and engage communities in data-driven decision-making.[31] Together, these organizations illustrate the transformative potential of fostering trust and collaboration in overcoming cultural resistance to data sharing.

Governance and Policy Constraints

Fragmented policies and regulatory frameworks often impede the progress of data interoperability. NGOs play a critical role in helping governments navigate these challenges by providing model policies, frameworks, and technical assistance. The American Legislative Exchange Council (ALEC) supports state legislators through model policies such as the Privacy Protection Act, which establishes standards for privacy practices and data security.[32] This model policy also includes recommendations for the creation of state privacy officers and oversight committees to enhance accountability.[33] The Digital Impact Alliance (DIAL) supports governments by creating tools and frameworks for trusted data sharing and effective policymaking.[34] By working with diverse stakeholders, DIAL helps design strategies that prioritize trust, accountability, and sustainable digital systems.[35]

Differential privacy technology is an algorithm that allows analysis of data while keeping the granular data private by adding statistical noise to the data set.[36] Large tech companies are currently working with and using this technology while universities and research labs like Duke are actively developing and exploring new and better applications of differential privacy technology.[37] These efforts would help lift the worries of non-compliance and allow more data sets to be shared and used to solve problems for the citizenry. NGOs like these provide essential resources and expertise, enabling governments to design and implement cohesive policies and improve decision-making.

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[29] National Civic League. (n.d.). All-America City Award. Retrieved from https://www.nationalcivicleague.org/america-city-award/

[30] Aspen Institute. (n.d.). *Urban innovation*. Retrieved from https://www.aspeninstitute.org/topics/urban-innovation/

[31] Isama, N. (2019, May 1). Tackling inequities with transparency & community. Sunlight Foundation. Retrieved from https://sunlightfoundation.com/2019/05/01/tackling-inequities-with-transparency-community/

[32] American Legislative Exchange Council. (2021, August 25). *The Privacy Protection Act*. https://alec.org/model-policy/the-privacy-protection-act/

[33] Ibid

[34] Digital Impact Alliance. (n.d.). *Home*. Digital Impact Alliance. Retrieved from https://dial.global/

[35] Ibid

[36] Duality Technologies. (n.d.). *Differential privacy*. Retrieved from https://dualitytech.com/glossary/differential-privacy/#:~:text=Differential%20Privacy%20adds%20noise%20to,results%20without%20identifying%20individual%20records.

[37] Duke University. (n.d.). Security, privacy, and data science. Retrieved from https://cs.duke.edu/research/security-privacy-data-science

Technical Barriers

Technical barriers can relate to over system needs or specific project needs. NGOs like Code for America collaborates with government agencies to develop digital tools and services that improve data sharing and interoperability.[38] For instance, their Integrated Benefits Initiative has streamlined access to multiple social services by creating unified applications, thereby enhancing data interoperability across programs.[39] Similarly, the U.S. Digital Response (USDR)
partners with government entities to provide rapid technical assistance, focusing on data infrastructure and interoperability.[40] USDR has supported various state and local governments in implementing data-sharing solutions that improve service delivery and inter-agency collaboration.[41] The Beeck Center for Social Impact + Innovation at Georgetown University is actively involved in promoting data interoperability through initiatives like the State Data Maturity Assessment, which helps states evaluate and improve their data practices.[42] This assessment empowers states to identify strengths and weaknesses in harnessing data insights for informed policymaking and service delivery.[43] Additionally, the Knight Foundation supports innovation in data interoperability by funding projects that integrate cutting-edge technologies such as AI and machine learning into municipal operations.[44] These technologies enhance governments' capacities for real-time data sharing and analysis, enabling more dynamic and efficient public service delivery.[45] By leveraging the expertise and resources of these NGOs, governments can overcome technical barriers to data interoperability, leading to more efficient and effective public service delivery.

Data Literacy and Skill Gaps

Addressing data literacy gaps, NGOs play an important role in equipping government employees with the skills necessary to interpret, analyze, and apply data in decision-making. The Data Literacy Project, a global initiative supported by leading organizations, provides comprehensive training programs designed to build foundational and advanced data literacy skills.[46] These programs are adaptable for public sector employees, covering key areas such as data-driven decision-making, ethical data use, and analytical techniques.[47] By fostering a culture of data understanding, the Data Literacy Project empowers government agencies to make informed decisions that enhance public services and accountability.

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[38] Code for America. (n.d.). *Code for America*. Retrieved from https://codeforamerica.org/

[39] Code for America. (n.d.). *Integrated Benefits Initiative*. Code for America. Retrieved from https://codeforamerica.org/programs/social-safety-net/integrated-benefits/

[40] U.S. Digital Response. (n.d.). *U.S. Digital Response*. Retrieved from https://www.usdigitalresponse.org/

[41] Ibid

[42] Beeck Center for Social Impact + Innovation. (2024, May 28). State Data Maturity Assessment. Georgetown University. Retrieved from https://beeckcenter.georgetown.edu/report/state-data-maturity-assessment/

[43] Ibid

[44] Knight Foundation. (n.d.). *Smart cities*. Retrieved from https://knightfoundation.org/smart-cities-2/

[45] Ibid

[46] The Data Literacy Project. (n.d.). *Data Literacy Project*. Retrieved from https://thedataliteracyproject.org/

[47] Ibid

What Works Cities, an initiative spearheaded by Bloomberg Philanthropies, specifically targets municipal governments, helping them integrate data into their operations.[48] Through tailored workshops, training sessions, and technical support, the program enhances the capacity of city officials to use data effectively.[49] What Works Cities also promotes data-sharing practices and the adoption of evidence-based policymaking, resulting in more transparent and impactful governance.[50]

The Center for Government Excellence (GovEx) at Johns Hopkins University focuses exclusively on strengthening the data capabilities of government employees.[51] GovEx offers immersive training programs and technical assistance to build capacity for data use across all levels of government.[52] Its workshops emphasize practical applications, such as improving service delivery and optimizing resource allocation through data-driven strategies.[53] By directly addressing skill gaps, GovEx ensures that governments can sustain progress in modernizing their operations (GovEx). By providing targeted training, resources, and ongoing support, these organizations enable government employees to build the skills needed to navigate the complexities of modern data systems

Serving as Knowledge Sharing Conveners

By fostering collaboration and disseminating best practices across all aspects of data interoperability, these organizations empower public sector leaders to leverage data effectively in decision-making and service delivery. For example, The Beeck Center for Social Impact + Innovation at Georgetown University exemplifies this role through its State Chief Data Officers Network, which connects state-level data leaders to share strategies, tools, and insights for improving data governance. Launched in 2019, this network provides resources such as policy guides, case studies, and collaborative workshops, enabling CDOs to tackle shared challenges in data management and analytics. By acting as a platform for peer-to-peer learning, the Beeck Center fosters a culture of innovation and accountability in state governments.[54]

Similarly, the Ash Center for Democratic Governance and Innovation at Harvard University supports urban CDOs through its Civic Analytics Network, a peer network dedicated to advancing the use of data and analytics in city governance. Since its establishment in 2016, the network has convened city-level data leaders to exchange ideas on topics such as

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[48] Bloomberg Philanthropies. (n.d.). *What Works Cities*. Retrieved from https://whatworkscities.bloomberg.org/

[49] Johns Hopkins University Center for Government Excellence (GovEx). (n.d.). *Center for Government Excellence*. Retrieved from https://govex.jhu.edu/

[50] Ibid

[51] Johns Hopkins University Center for Government Excellence (GovEx). (n.d.). *Center for Government Excellence*. Retrieved from https://govex.jhu.edu/

[52] Ibid

[53] Ibid

[54] Beeck Center for Social Impact + Innovation. (n.d.). *Beeck Center for Social Impact + Innovation*. Retrieved from https://beeckcenter.georgetown.edu/

predictive analytics, data visualization, and ethical data use. The Ash Center also provides a repository of best practices and case studies, enabling cities to adopt cutting-edge approaches to improve transparency and service delivery. [55]

The National Interoperability Collaborative (NIC), led by the Stewards of Change Institute (SOCI), serves as a "community of networks" that promotes data interoperability across sectors such as public health, human services, and emergency response. NIC's efforts include the development of conceptual models, like the Consent Service Utility, which addresses data-sharing challenges while safeguarding privacy. Additionally, NIC's Collaboration Hub provides a secure platform for stakeholders to share resources, discuss challenges, and co-create solutions, fostering an ecosystem of knowledge exchange and innovation.[56]

These organizations demonstrate the transformative power of knowledge-sharing conveners. By connecting leaders, curating resources, and fostering collaborative environments, they enable the public sector to harness the full potential of data to improve governance and deliver better outcomes for communities.

By addressing these four major challenge areas, non-government stakeholders create the foundation for more cohesive and interoperable data-sharing ecosystems. Their efforts enable governments to modernize systems, build trust, align policies, and develop the skills necessary to sustain progress. Through strategic partnerships and targeted interventions, NGOs play an indispensable role in advancing data interoperability and improving public service delivery.

VII. How Non-Government Organizations Can Join the Effort

Each level of government faces distinct challenges in the areas of leadership, governance, technology, and data literacy. Non-government organizations (NGOs) can effectively join the effort to support intergovernmental data interoperability and maximize their impact by determining the most appropriate level of government with which to engage and by taking targeted action in the challenge areas, based on the organization's expertise and resources. In addition, NGOs acting as knowledge sharing conveners can have impact at all levels of government by bringing stakeholders together to share best practices, align strategies, and create actionable frameworks. These convening NGOs create trusted platforms that foster alignment and innovation, providing governments with the resources and frameworks they need to advance interoperability efforts effectively.

Federal Level

At the federal level, NGOs with extensive expertise in technology development, policy advocacy, and large-scale project management can make significant contributions. Federal agencies often face complex challenges related to modernizing legacy systems, fostering

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[55] Harvard University Ash Center for Democratic Governance and Innovation. (n.d.). *Ash Center for Democratic Governance and Innovation*. Retrieved from https://cities.harvard.edu/

[56] Stewards of Change Institute. (n.d.). *National Interoperability Collaborative*. Retrieved from https://nic-us.org/

collaboration across departments and ensuring data sharing complies with national privacy laws. NGOs that engage at this level can influence nationwide projects and set the standard for interoperability practices.

How NGOs Can Help:

Leadership, Trust, and Cultural Challenges:

- *Develop Federal Leadership Training Programs*: NGOs can collaborate with the CDO Council to create leadership workshops that prioritize data-sharing initiatives and promote interdepartmental cooperation. These programs should aim to build a collaborative, data-driven culture.

- *Consult on Data Governance Strategies*: NGOs can offer consulting services to federal leaders to help develop governance strategies that promote accountability, transparency, and trust in data-sharing practices. By establishing clear governance protocols, NGOs can support federal leaders in fostering a culture that values data integrity and collaboration, addressing both trust and cultural barriers to data sharing.

Governance and Policy Challenges:

- *Organize Policy Alignment Workshops*: NGOs specializing in legal and policy frameworks can host workshops to bring together federal policymakers and promote alignment with privacy regulations like HIPAA and guidance on legislation like the OPEN Government Data Act.
- *Provide Legal Templates and Guidance*: NGOs can develop standardized legal templates and compliance guidance to support federal agencies in balancing interoperability goals with legal obligations.

Technical Challenges:

- *Partner with Federal Entities*: NGOs can work with organizations such as the USDS and the GSA's TTS to provide solutions for cloud integration, data architecture, and AI implementation to modernize federal systems.
- *Propose and Implement Pilot Projects*: NGOs can approach federal agencies to propose pilot projects that test and demonstrate the scalability of new technology solutions. These projects can serve as models for broader implementation across federal systems.

Data Literacy and Skill Gaps:

- *Offer Comprehensive Data Training Programs*: NGOs can partner with federal agencies to deliver targeted data literacy workshops designed to equip employees with essential data management and analytics skills needed for interoperable systems.
- *Develop Online Training Modules*: NGOs can create accessible, self-paced online training resources for federal employees, supporting continuous professional development in data-related competencies.

State Level

State governments often act as intermediaries, bridging federal frameworks with local implementations. This makes states a strategic focus for NGOs engaged in sector-specific challenges, technology modernization, and capacity-building efforts. NGOs can assist states in aligning policies with federal frameworks, enhancing technical systems, and developing leadership and data literacy.

How NGOs Can Help:

Leadership, Trust, and Cultural Challenges:

- *Establish Statewide Leadership Academies*: NGOs can collaborate with state agencies to launch leadership academies that emphasize data sharing and interdepartmental collaboration, fostering a cohesive state-level data-sharing culture.
- *Foster Interagency Collaboration Programs*: NGOs can set up interagency collaboration initiatives that bring together state leaders from various departments, promoting cross-sector collaboration and consistent data management practices.

Governance and Policy Challenges:

- *Host State Policy Alignment Sessions*: NGOs can organize sessions for state governments to harmonize their data policies with federal guidelines like the OPEN Government Data Act, reducing fragmentation and legal inconsistencies.
- *Develop State-Specific Compliance Resources*: NGOs can create resources tailored for states, such as compliance guides and policy templates, ensuring that state governments have the tools they need to align with federal regulations.

Technical Challenges:

- *Bridge State-Federal Technology Gaps*: NGOs can work with state agencies to develop technical solutions that integrate state systems with federal frameworks, such as NIEM, ensuring compatibility.
- *Apply for and Administer State Grants*: NGOs can apply for state technology innovation grants and manage funded projects that build and expand interoperable systems, demonstrating effective federal-state partnerships.

Data Literacy and Skill Gaps:

- *Launch State Employee Training Programs*: NGOs can partner with state agencies and academic institutions to deliver training programs that build data literacy and technical skills among state employees.

- *Establish Regional Data Literacy Hubs*: NGOs can set up regional hubs that offer ongoing data literacy support and training for state agencies, creating a sustainable pipeline for skilled data professionals.

Local Level

Local governments often have the most immediate and tangible needs but face significant resource and technical constraints. NGOs with a focus on community-based initiatives, civic technology, and grassroots engagement are well-suited to support municipalities in building data capacity and implementing interoperable systems. Local-level engagement allows NGOs to have a direct impact by piloting new solutions and helping municipalities integrate into broader state and federal data systems.

How NGOs Can Help:

Leadership, Trust, and Cultural Challenges:

- *Run Local Leadership Workshops*: NGOs can partner with municipal agencies to conduct workshops that promote data-driven governance, helping to build collaborative cultures within local government.
- *Establish Local Data Councils*: NGOs can work with local governments to form data councils that bring together municipal leaders to collaborate on and align data-sharing practices, improving integration and transparency.

Governance and Policy Challenges:

- *Set Up Legal Assistance Clinics*: NGOs can offer clinics to help local governments establish data-sharing agreements that align with state and federal requirements.
- *Provide Pro Bono Legal Support*: NGOs can offer free or subsidized legal assistance to municipalities, helping them navigate complex regulations and align with frameworks like NIEM.

Technical Challenges:

- *Provide Local Open-Source Solutions*: NGOs, can deploy open-source tools tailored for municipal needs, helping local governments modernize and integrate their systems with broader frameworks.
- *Offer Technical Assistance Packages*: NGOs can deliver on-site technical support and customization services for local governments to ensure their data systems align with state and federal interoperability standards.

Data Literacy and Skill Gaps:

- *Deliver Municipal Data Literacy Workshops*: NGOs can partner with local governments to provide hands-on workshops that teach foundational data skills to municipal employees, enhancing their ability to manage data systems.
- *Create Community-Based Data Academies*: NGOs can establish data academies in partnership with local universities that provide continuous training and development opportunities for municipal staff, ensuring they remain up to date with evolving technologies.

Maximizing Impact Through NGO Partnerships

To maximize their effectiveness, NGOs can consider partnering with other NGOs that bring complementary expertise to the table. By collaborating, NGOs can amplify their collective impact and create a more comprehensive approach to addressing data interoperability challenges, reaching a broader range of government agencies.

Benefits of NGO Partnerships:

- *Broader Skill Sets*: Partnering with NGOs that specialize in different areas (e.g., technology solutions, data governance, legal frameworks, and data literacy) enables a well-rounded approach to interoperability challenges. For instance, an NGO with technical expertise in cloud integration could collaborate with a policy-focused NGO to. provide a cohesive solution that addresses both the technical and regulatory aspects of data sharing.
- *Resource Sharing*: By pooling resources, NGOs can extend their reach and reduce costs. Joint initiatives, such as data literacy workshops or legal clinics, become more feasible when organizations share funding, personnel, and logistical support.
- *Improved Local Engagement*: Collaborations between national and community-based NGOs allow for targeted approaches that align federal and state frameworks with local needs. For example, a national NGO can provide standardized training materials, while a local NGO adapts these materials to the specific needs of municipal staff.

NGOs play an essential role in advancing intergovernmental data interoperability by addressing challenges in leadership, governance, technology, and data literacy. All of the actions discussed above offer meaningful pathways for NGOs to contribute to this effort. From that list, particularly impactful actions include developing leadership training programs at all levels of government, organizing policy alignment workshops to harmonize data-sharing practices, implementing pilot projects to demonstrate scalable technical solutions, and bridging technology gaps to modernize outdated systems. Additionally, fostering interagency collaboration and creating regional data literacy hubs can address structural and skill-based barriers to interoperability. By focusing on these strategic actions, NGOs can maximize their impact, helping governments at every level build robust, interoperable systems and strengthen trust in data-driven governance.

VIII. Examples of Collaborations

PDMP Interoperability Initiative[57]

The Prescription Drug Monitoring Program (PDMP) Interoperability Initiative, supported by the CDC and the Office of the National Coordinator for Health Information Technology

(ONC), facilitates data sharing between states to combat the opioid crisis. This initiative connects state-run PDMPs, allowing healthcare providers to access critical prescription data. By 2022, 49 states had adopted data-sharing practices through interstate hubs like RxCheck, enhancing efforts to monitor and reduce opioid misuse.

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[57] Centers for Disease Control and Prevention. (n.d.). *Prescription drug monitoring programs (PDMPs)*. Retrieved from https://www.cdc.gov/overdose-prevention/php/interventions/prescription-drug-monitoring-programs.html

California's Collaboration with Code for America[58]

California partnered with Code for America to implement the Clear My Record platform, an open-source solution that automates the process of identifying and expunging eligible criminal records. By leveraging this technology, California identified over 144,000 cases eligible for expungement, significantly reducing administrative burdens on local jurisdictions and improving access to justice for affected individuals.

Environmental Data Sharing: Water Data Collaborative[59]

The Water Data Collaborative is an initiative that brings together NGOs and government agencies to enhance the collection, sharing, and utilization of water quality data across the United States. By standardizing data collection methods and promoting open data practices, this collaboration has improved water resource management and policymaking.

IX. Conclusion

Achieving data interoperability across federal, state, and local levels of government is no longer just a technical ambition—it is a fundamental necessity for operating the United States as a cohesive enterprise. Its importance cannot be overstated: interoperable data enables real-time decision-making, fosters collaboration, and ensures that government operations are proactive rather than reactive. By understanding patterns and acting on integrated insights, government systems can serve the public efficiently, equitably, and transparently.

The United States government faces significant challenges in implementing interoperability due to outdated systems, fragmented policies, privacy concerns, and gaps in workforce skills. Although initiatives like the Federal Data Strategy (FDS) and efforts at state and local levels aim to address these barriers, progress remains inconsistent. Non-governmental organizations (NGOs) have stepped in as vital partners, offering innovative tools, training programs, and collaborative frameworks to bridge gaps that government agencies alone struggle to overcome.

NGOs play an indispensable role in this mission. They help establish trust among stakeholders, develop model policies to navigate governance challenges, introduce technical solutions to modernize systems, serve as educators on the benefits of interoperability, and assist with data literacy training. More importantly, they act as conveners—bringing together government entities, private organizations, and communities to align efforts and share best practices. Their work showcases the critical need for partnerships in building resilient, data-driven governance structures.

To advance the mission of interoperability, stakeholders must act with urgency. First, individuals and organizations should raise awareness of the importance of data interoperability at every

opportunity. Advocacy ensures the topic remains a priority in public discourse and policy agendas. Second, we must educate and train government employees across all levels as quickly as possible, empowering them with the understanding of the benefits of interoperability and the skills to manage modern data systems effectively. Finally, demonstrative projects must be

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[58] Code for America. (n.d.). *Automatic record clearance*. Retrieved from https://codeforamerica.org/programs/criminal-justice/automatic-record-clearance/

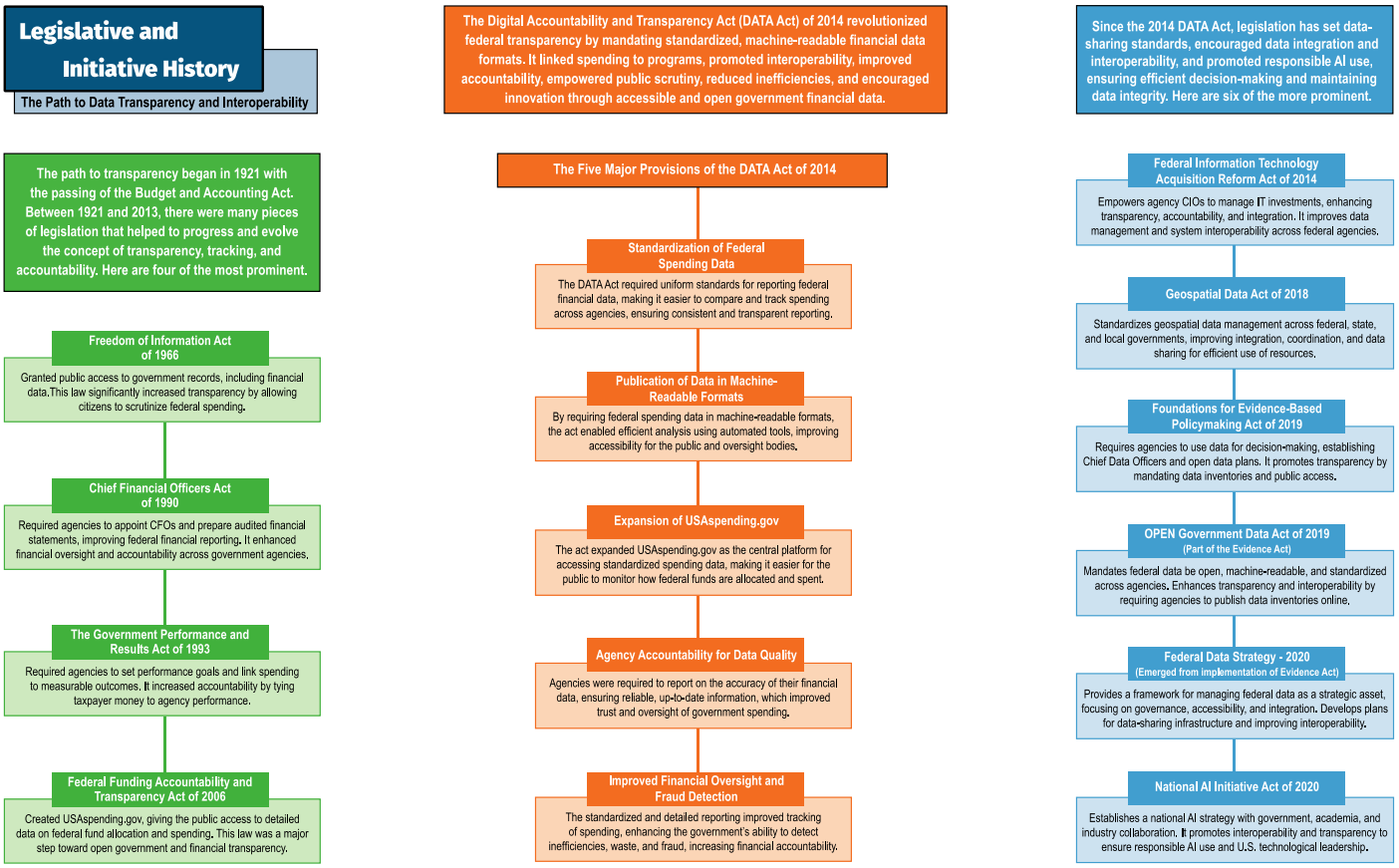
[59] Water Data Collaborative. (n.d.). *Water Data Collaborative*. Retrieved from https://www.waterdatacollaborative.org/

initiated to showcase how intergovernmental data sharing can work both vertically and horizontally—from local to federal levels and across sectors. Sharing the successes and lessons learned from these projects will inspire broader adoption and innovation.

Advocate. Educate. Demonstrate. The time for action is now. Without a unified approach, the United States risks continuing operating in silos, unable to respond swiftly and effectively to the needs of its citizens. More data, integrated and accessible, will allow us to understand and proactively manage the enterprise that is our nation, moving beyond reactive governance. NGOs, in collaboration with government and private entities, are uniquely positioned to lead the charge. Together, we can create systems that deliver the benefits of interoperability: improved public services, increased transparency, and a government that truly serves its people with agility and foresight.

X. APPENDICES

APPENDIX A:
Legislative History: The Road to Data Interoperability



APPENDIX B:
Source Analysis

The sources in this report address many challenges and solutions related to data interoperability, offering a balanced look at how governments, NGOs, businesses, and academics contribute to this effort. A common theme in these materials is the technical and organizational difficulties that make data sharing hard. These include outdated systems, inconsistent data formats, and a tendency for organizations to work in silos without coordinating. Privacy and compliance issues also create hurdles, especially when sharing sensitive data. Many sources highlight the importance of using new technologies, like AI and real-time data platforms, paired with clear policies and governance practices to make progress. Collaboration among different sectors is often seen as critical, with each bringing unique strengths to the table.

Across the sources, one major takeaway is that interoperability is essential for improving government services, responding to crises, and enhancing decision-making. At the same time, privacy concerns must be carefully balanced with the need for shared data. Some sources recommend technologies like differential privacy to help protect sensitive information while still enabling data sharing. Real-time data integration is seen as particularly transformative, allowing governments and organizations to respond more quickly to problems. Collaboration among sectors is also a key theme, as no single group can solve these challenges alone. NGOs help build trust and connect groups, government agencies provide regulations and support, and businesses drive technological advancement.

The authors of these sources approach the topic in various ways, including detailed case studies, data-driven evidence, and practical recommendations. For example, government reports often include lessons learned from events like Hurricane Sandy, showing what worked and what didn't. Private companies offer actionable frameworks for building interoperable systems, while NGOs and think tanks focus on advocacy and training tools. Academics contribute theoretical and evidence-based insights to validate ideas and suggest long-term strategies. However, gaps remain, particularly in finding solutions for areas with fewer resources and figuring out how global standards could help local data-sharing efforts.

In summary, data interoperability requires a collaborative approach that involves governments, NGOs, businesses, and academia. Governments create the rules and frameworks needed to enable data sharing, while NGOs build partnerships and ensure data is used within the proper guidelines. The private sector brings innovation and tools to improve data systems, and academics provide research and analysis to guide long-term decisions. Each group has its

strengths and weaknesses, but working together is essential to overcoming the challenges of data interoperability.

APPENDIX C:
Reference Material and Summaries

Articles

Baltimore City Mayor's Office. (2023, March 9). City launches Baltimore Data Academy: Training program for city employees [Press release]. Retrieved from https://mayor.baltimorecity.gov/news/press-releases/2023-03-09-city-launches-baltimore-data-academy-training-program-city-employees

> This press release announces the launch of the Baltimore Data Academy, a training program designed to enhance the data skills of city employees. The initiative aims to foster a data-driven culture within Baltimore's municipal workforce, enabling employees to use data effectively in decision-making and service improvement. The program offers courses on data analysis, visualization, and management, emphasizing practical applications in government operations. By investing in data literacy, the city seeks to improve public service delivery and operational efficiency.

Barrett, K., & Greene, R. (2023, December 5). Data literacy drive aims to educate public sector workforce. Route Fifty. Retrieved from https://www.route-fifty.com/workforce/2023/12/data-literacy-drive-educate-public-sector-workforce/392503/

> This article highlights efforts to improve data literacy among public sector employees to better equip them for data-informed decision-making. It underscores the growing need for governments to develop training programs that teach employees how to analyze and apply data in policy development and service delivery. The article discusses the challenges of implementing such initiatives, including budget constraints and diverse skill levels among employees. It also showcases successful programs, emphasizing their role in fostering a culture of data-driven governance.

Center for Digital Government Content Studio, & SoftwareAG Government Solutions. (2022, July 19). *How an API integration platform lets government agencies modernize faster with lower risk. Government Technology.* Retrieved from https://www.govtech.com/sponsored/how-an-api-integration-platform-lets-government-agencies-modernize-faster-with-lower-risk.

> API integration platforms enable government agencies to modernize incrementally, allowing them to avoid disruptive overhauls while improving data sharing and service innovation. These platforms streamline operations by connecting legacy and modern systems, while tools like low-code applications and robotic process automation (RPA) increase efficiency and address workforce shortages. However, managing multiple APIs can become complex, and security risks

require careful governance. Despite these challenges, API platforms are a faster, less risky approach to digital transformation, making them essential for government modernization efforts. Agencies should adopt API governance and address security concerns early.

Colclough, G., Feehan, E., Kahn, J., Singh, S., & Yau, B. (2022, November 21). *Accelerating data and analytics maturity in the US public sector.* McKinsey & Company. Retrieved from https://www.mckinsey.com/industries/public-sector/our-insights/accelerating-data-and-analytics-maturity-in-the-us-public-sector

Accelerating data and analytics maturity is essential for improving decision-making and service delivery in the US public sector. This requires upgrading data infrastructure, establishing robust data governance, and cultivating a culture of data-driven decision-making across agencies. However, challenges such as siloed data systems, skills shortages, and limited interagency collaboration present obstacles. Advancing data maturity allows public services to operate more efficiently and effectively. To achieve this, agencies should focus on enhancing cross-agency collaboration, improving infrastructure, and upskilling employees to handle data-driven tasks.

Collier, J., & Su, L. (2021, January 28). *Data-driven government in large & small cities: Unpacking the relationship between a city's population and performance on the WWC Assessment.* What Works Cities Certification. https://medium.com/what-works-cities-certification/data-driven-government-in-large-small-cities-8d52d5bbaf0

Data-driven governance can improve city performance, regardless of population size, by focusing on strategic data use and transparency. Larger cities tend to have more resources and infrastructure for data initiatives, while smaller cities face challenges such as limited funding and staff. However, smaller cities can still succeed by fostering a data-centric culture and collaborating with external partners. Although smaller municipalities may struggle with scalability and access to resources, they can optimize performance through intentional planning. Cities should prioritize building data capacity, leveraging partnerships, and fostering leadership to drive meaningful improvements in governance.

Diebold, G. (2023, September 25). *Overcoming barriers to data sharing in the United States.* Center for Data Innovation. https://datainnovation.org/2023/09/overcoming-barriers-to-data-sharing-in-the-united-states/

Overcoming barriers to data sharing is crucial for unlocking the potential of data-driven innovation in sectors like healthcare, education, and finance. Access to comprehensive data improves decision-making and helps tackle societal challenges. However, various obstacles impede progress. Legal barriers, such as restrictive privacy laws, and social barriers, like public mistrust and privacy concerns, prevent effective data exchange. Technical issues, including the lack of universal data standards, and economic disincentives for data sharing further complicate the process. Without addressing these challenges, data will remain siloed, limiting its potential for use in areas like artificial intelligence. To overcome these hurdles, policymakers should reform privacy laws to encourage responsible data sharing, develop standardized contracts and technical frameworks, and implement data literacy programs to help communities understand the benefits and security of data sharing. Coordinated action is needed to foster a more collaborative data-sharing environment, unlocking significant social and economic benefits.

Dougherty, L. (2016, January 19). *Lessons Learn from Katrina and Sandy.* The Regulatory Review. Retrieved from https://www.theregreview.org/2016/01/19/dougherty-gao-report-fema/

A Government Accountability Office (GAO) report highlights FEMA's progress and ongoing challenges in disaster response since reforms enacted after Hurricane Katrina. The report acknowledges FEMA's improved national preparedness, particularly through better data collection and capability assessments. However, issues remain, including the strain on local governments during recovery phases, exacerbated by increasingly frequent and severe disasters. While FEMA has introduced controls to reduce improper payments, persistent challenges in disaster response and recovery underline the need for continuous operational improvements to effectively manage future crises.

Global Economy and Development at Brookings. (2022, January). *Interoperable, agile, and balanced: Rethinking technology policy and governance for the 21st century.* Brookings Institution. Retrieved from https://www.brookings.edu/articles/interoperable-agile-and-balanced-rethinking-technology-policy-and-governance-for-the-21st-century/.

Effective technology policy and governance must be interoperable, agile, and balanced to manage the risks posed by emerging technologies and foster global cooperation and innovation. Current regulatory frameworks are fragmented and often lack the focus needed to address issues like data privacy, security, and competition. Policymakers need transparent and holistic tools that balance national and international objectives, including setting clear standards and gathering cross-jurisdictional evidence. Agile governance models, which emphasize adaptability and collaboration, are crucial for responding to the rapid pace of technological advancements. However, existing frameworks tend to be reactive rather than proactive, delaying responses to critical issues. Moreover, cross-jurisdictional collaboration is hindered by differing national priorities, resulting in inconsistent global regulations. A shift toward more interoperable and agile governance is essential for balancing innovation with societal safety. Policymakers should focus on flexible governance models, standardization, and transparency to ensure regulations keep pace with technological developments.

Goldstein, P. (2022, March 28). How localities are using ARPA funds for IT modernization. StateTech Magazine. Retrieved from https://statetechmagazine.com/article/2022/03/how-localities-are-using-arpa-funds-it-modernization

This article discusses how local governments are leveraging funds from the American Rescue Plan Act (ARPA) to upgrade their IT infrastructure and address long-standing digital challenges. Localities are investing in projects such as modernizing legacy systems, enhancing cybersecurity, and expanding digital access for underserved communities. The article highlights examples of specific projects, showcasing how ARPA funding is enabling critical technological improvements to enhance service delivery, improve operational efficiency, and foster equitable access to government resources.

Gonzalez, A. (2023, January 12). More states are pushing for race and ethnicity data equity. Center for Public Integrity. Retrieved from https://publicintegrity.org/politics/elections/who-counts/more-states-are-pushing-for-race-and-ethnicity-data-equity/

Efforts are increasing to improve the collection and use of detailed race and ethnicity data, with the goal of promoting equity and addressing systemic disparities. New policies in some states require government agencies to gather more precise demographic information, including expanded categories to better represent diverse populations. These state-level initiatives go beyond the federal government's more limited and general categories, which fail to capture the nuanced identities of many communities.

By introducing more detailed classifications, states are working to rectify historical inaccuracies in data collection that have often led to the underrepresentation of specific groups. This enhanced data enables policymakers and service providers to identify and address gaps in public services, ensuring more effective resource allocation and equitable outcomes. Through these efforts, states aim to foster a more inclusive and accurate understanding of their populations, promoting fairness and advancing civil rights.

Hoogstad, M. (2023, October 5). *Achieving access to real-time data: How data is transforming and innovating government.* Open Access Government. Retrieved from https://www.openaccessgovernment.org/achieving-access-to-real-time-data/167790/#:~=Real%2Dtime%20data%20enhances%20regulatory,potential%20risks%20are%20identified%20early.

Access to real-time data is revolutionizing government operations by improving decision-making, enabling timely responses to emergencies, and optimizing resource allocation. This data supports transparent policymaking, ensures efficient service delivery, and strengthens regulatory oversight. Cloud technology plays a key role in managing and sharing data, helping governments act quickly and coherently. However, challenges such as fragmented data systems and infrastructure limitations can hinder its full potential. To fully leverage real-time data, governments should focus on cloud integration, enhanced data sharing, and building data literacy frameworks.

Isama, N. (2019, May 1). Tackling inequities with transparency & community. Sunlight Foundation. Retrieved from https://sunlightfoundation.com/2019/05/01/tackling-inequities-with-transparency-community/

In Tackling Inequities with Transparency & Community, Noel Isama explores the role of transparency and community engagement in addressing systemic inequities. The article emphasizes the importance of open data and accessible information in empowering marginalized communities to participate in decision-making processes. Isama highlights examples where transparency initiatives have helped uncover disparities and drive policy changes. The piece advocates for fostering stronger collaborations between governments, organizations, and communities to create inclusive solutions and ensure accountability. By prioritizing transparency and equity, the article argues, public institutions can build trust and work toward more just outcomes.

James, M. (2022, August 24). *Why government must heed real-time data management trends.* Open Access Government. Retrieved from https://www.openaccessgovernment.org/why-government-must-heed-real-time-data-management-trends/142266/.

Governments must adapt to real-time data management trends to improve efficiency, enhance service delivery, and respond to challenges more effectively. Real-time data facilitates faster decision-making, especially in emergencies, and supports innovations through AI and machine learning. However, the rapid growth of unstructured data, especially from IoT devices, poses management challenges, while cybersecurity risks increase alongside data expansion. To leverage real-time data effectively, governments should invest in robust data infrastructure, enhance data security, and integrate AI-driven analytics for smarter governance and improved public services.

Kapur, V., McEwan, M., & Wainstein, J. (2023, July 17). *The power of data ecosystems.* Deloitte Insights. Retrieved from https://www2.deloitte.com/us/en/insights/industry/public-sector/chief-data-officer-government-playbook/2023/data-ecosystem.html.

> Data ecosystems empower organizations by enabling collaboration and data sharing, thus driving richer insights and mission impact. These ecosystems enhance transparency and allow various entities to access external data and talent, which is crucial for addressing complex challenges. Cloud technology and AI streamline data sharing and management, making it more efficient. However, data privacy and governance issues require robust security frameworks and trust among

participants. To maximize ecosystem value, organizations should focus on building interoperable platforms, fostering trust, and establishing clear governance structures.

McCarter, M. (2024, March 27). NASCIO calls for states to implement data literacy programs. StateTech Magazine. Retrieved from https://statetechmagazine.com/article/2024/03/nascio-calls-states-implement-data-literacy-programs

This article discusses the National Association of State Chief Information Officers' (NASCIO) recommendation for states to adopt data literacy programs. NASCIO emphasizes the importance of equipping state employees with the skills needed to effectively interpret, analyze, and use data in decision-making processes.

The article highlights how data literacy can improve governance by fostering a culture of evidence-based policymaking and enhancing public service delivery. It also addresses the challenges of implementing such programs, including securing funding, overcoming resistance to change, and tailoring training to diverse workforce needs. NASCIO underscores the need for cross-agency collaboration and strategic investment to build a data-literate workforce capable of leveraging data as a strategic asset.

Partner Content. (2022, July 11). *Data now, not later: Why real-time information represents a step change for policymakers.* Global Government Forum. Retrieved from https://www.globalgovernmentforum.com/data-now-not-later-why-real-time-information-represents-a-step-change-for-policymakers/.

Real-time data presents a significant advancement for policymakers, enabling quicker, more accurate decision-making and enhancing public service delivery. By using real-time information, governments can monitor unfolding events, respond rapidly to emergencies, and allocate resources more efficiently. This data also provides valuable insights when combined with geospatial information, helping shape effective policies. However, the implementation of real-time data systems raises ethical concerns, particularly about privacy and potential misuse of personal information.
Additionally, integrating such systems comes with technical challenges, including ensuring data security and robust governance. To fully leverage the benefits of real-time data, governments must focus on creating collaborative platforms, maintaining strong data governance, and communicating transparently with the public to build trust. Investments in innovative data management systems will also be critical to maximizing the potential of real-time information.

Scoop News Group. (2024, February 13). *Grasping data modernization in state and local governments*. StateScoop. Retrieved from https://statescoop.com/grasping-data-modernization-in-state-and-local-governments/.

Data modernization is crucial for state and local governments to improve operational efficiency, foster innovation, and build public trust, especially with the growing role of technologies like AI. Quality data acts as a strategic asset, enabling better decision-making and resource management. However, challenges such as limited resources, reliance on third-party management, and fragmented governance hinder modernization efforts. To overcome these barriers, governments need to focus on training, strengthen data architectures, and align data strategies with agency goals to ensure successful modernization initiatives.

Šulženko, A. (2023, June 20). *How governments use alternative data to inform policy decisions*. Data Science Central. Retrieved from https://www.datasciencecentral.com/how-governments-use-alternative-data-to-inform-policy-decisions/.

Governments are increasingly leveraging alternative data sources, such as mobile apps, satellite imagery, and credit card transactions, to enhance policymaking in areas like economics, social welfare, environmental protection, healthcare, and crime prevention. These data sources provide real-time insights that support more dynamic and informed decisions. However, challenges include privacy concerns and the complexity of managing vast and diverse data sets. To fully harness the benefits of alternative data, governments must improve governance, invest in data analysis technologies, and maintain transparency with citizens about data collection practices.

Varn, J., Gong, L., & Humphrey, C. (2023, May 23). *How state broadband offices are using initial dollars from Capital Projects Fund*. The Pew Charitable Trusts. Retrieved from https://www.pewtrusts.org/en/research-and-analysis/articles/2023/05/23/how-state-broadband-offices-are-using-initial-dollars-from-capital-projects-fund.

States are utilizing the initial allocations from the Capital Projects Fund (CPF) to expand broadband access, primarily focusing on unserved and underserved areas by funding "last-mile" connections. These funds are being used in various ways, from line extension programs and digital literacy initiatives to improving public Wi-Fi infrastructure. The CPF programs are designed to complement upcoming federal broadband programs like the Broadband Equity, Access, and Deployment (BEAD) program. However, challenges arise as states may struggle to align these efforts with broader federal initiatives and ensure the funds effectively reach the most underserved communities. Overall, CPF dollars are vital for closing the digital divide, but states need to prioritize detailed broadband strategies, enhance community engagement, and coordinate with future federal funding opportunities to maximize long-term success.

Waldman, A., & Fortis, B. (2021, October 20). *The federal government gave billions to America's schools for COVID-19 relief. Where did the money go?* ProPublica. Retrieved from https://www.propublica.org/article/the-federal-government-gave-billions-to-americas-schools-for-covid-19-relief-where-did-the-money-go.

The federal government allocated billions in COVID-19 relief to schools, but the tracking of how these funds were spent is inconsistent, with a wide range of uses. Many districts used significant portions of the funds on infrastructure projects, such as outdoor learning spaces or sports facilities, rather than addressing immediate educational challenges like learning loss. Technology purchases, such as laptops for virtual learning, also accounted for a portion of the spending. However, some districts used the relief money to cover operational costs, like custodial salaries, or to fill budget gaps caused by state cuts. Despite these efforts, there is a lack of standardized reporting across states, making it difficult to fully assess how effectively the funds were used to

address the pandemic's impact on education. Greater transparency and prioritization of direct student support are recommended to ensure the funds help students recover from learning disruptions.

Whitlock, H. (2023, May 26). *Why interoperability is the foundation for federal IT modernization*. Federal News Network. Retrieved from https://www.federaltimes.com/opinions/2023/05/26/why-interoperability-is-the-foundation-for-federal-it-modernization/.

Interoperability is crucial for federal IT modernization, as it enables seamless data exchange between various systems, enhancing efficiency, security, and citizen services. By promoting collaboration between legacy and modern technologies, interoperability supports critical government functions like public health, emergency response, and security. However, many existing systems face compatibility challenges, leading to delays and inefficiencies. To overcome this, interoperability should be a core focus of federal IT modernization strategies, with investments in technologies that facilitate seamless integration across agencies.

Yannella, P. N., & Dickens, T. (2024, June 7). New state privacy laws creating complicated patchwork of privacy obligations. Reuters. Retrieved from https://www.reuters.com/legal/legalindustry/new-state-privacy-laws-creating-complicated-patchwork-privacy-obligations-2024-06-07/

This Reuters article discusses the challenges posed by the increasing number of state-level privacy laws in the United States. These laws create a complex and fragmented legal landscape for organizations operating across multiple states, as they must navigate varying compliance requirements. The article explores the implications for businesses, highlights emerging trends in state privacy legislation, and examines how organizations are adapting to address these evolving obligations.

Blog Posts

Greenfield, G., & Bruhn, M. (2024, February 9). *Data modernization: How federal agencies are learning from commercial peers.* IQVIA. Retrieved from https://www.iqvia.com/locations/united-states/blogs/2024/01/data-modernization.

Federal agencies are leveraging data modernization strategies from the commercial sector to improve efficiency, data sharing, and decision-making. Modernization efforts focus on enhancing data standardization, real-time insights, and collaboration across agencies, particularly in healthcare and public health initiatives. However, legacy systems and fragmented data present challenges to seamless implementation. Adopting best practices, such as human-centered design and secure data management, helps agencies overcome these barriers. To optimize outcomes, agencies should prioritize secure, scalable, and standardized data systems that enhance collaboration and decision-making capabilities.

GW Law. (2024, September 17). *GW Law to provide AI training to federal government.* GW Today. https://gwtoday.gwu.edu/gw-law-provide-ai-training-federal-government

GW Law is providing essential AI training to federal policymakers to ensure that AI technologies are acquired and deployed ethically, effectively, and securely, aligning with national priorities for

AI governance. The training focuses on critical topics like risk management, national security, and AI regulatory compliance, supporting federal efforts to manage AI technologies responsibly. By leveraging its multidisciplinary expertise and collaborating with federal agencies, GW Law aims to strengthen the government's capacity to handle AI's complexities. However, the challenge lies in standardizing AI governance knowledge across various departments. Ultimately, this training is vital for enhancing the federal workforce's readiness for AI innovations while safeguarding the public interest. Federal agencies are encouraged to continue investing in AI education and establish clear frameworks for procurement and ethics.

Kiran, M. M. (2024, January 29). *Navigating the intersection of data sharing, open data, and privacy: Insights from state chief data officers.* Beeck Center for Social Impact + Innovation. https://beeckcenter.georgetown.edu/navigating-the-intersection-of-data-sharing-open-data-and-privacy/

> State Chief Data Officers (CDOs) face the challenge of balancing data sharing, open data initiatives, and privacy protection while promoting transparency and innovation. Open data improves transparency and fosters innovation, but challenges such as data standardization, quality assurance, and interagency collaboration remain. Privacy officers are essential in managing the balance between openness and privacy protection. To succeed, state governments need robust governance frameworks, privacy integration, and regular data maturity assessments to enhance data management while maintaining trust and transparency.

Rackas, L. (2021, May 20). Interoperability: *Why childcare data systems need to talk*. Child Care Aware of America. Retrieved from https://info.childcareaware.org/blog/interoperability-why-child-care-data-systems-need-to-talk.

> Interoperability between childcare data systems is crucial for enhancing transparency, accessibility, and decision-making within the childcare sector. By enabling real-time data sharing, policymakers can make informed decisions to address childcare shortages, while parents benefit from centralized access to essential information, such as program quality and subsidy details. Advocates and policymakers can also use this data to push for better funding and support. However, inconsistent data standards across states hinder these efforts. Standardized data-sharing frameworks and stakeholder collaboration are recommended to improve interoperability.

Wickr Staff. (2022, August 5). *What the increase in data usage means for government databases*. Wickr. Retrieved from https://wickr.com/what-the-increase-in-data-usage-means-for-government-databases/.

> The rise in data usage presents opportunities for government agencies to improve decision-making, crisis management, and public services by enhancing data access and sharing. Increased interoperability and data sharing can reduce administrative burdens and provide a better experience for citizens. However, scattered data and outdated systems present challenges, limiting seamless data integration. To address this, governments must modernize their data systems and invest in secure, cloud-based platforms with robust data governance frameworks to ensure security and improve operational efficiency.

Books

Pahlka, J. (2023, June 13). Recoding America: Why government is failing in the digital age and how we can do better. St. Martin's Press.

In "Recoding America: Why Government Is Failing in the Digital Age and How We Can Do Better," Jennifer Pahlka, founder of Code for America and former U.S. Deputy Chief Technology Officer, examines the challenges governments face in adapting to the digital era. She argues that outdated technological infrastructures, rigid procurement practices, and a focus on compliance over outcomes hinder effective public service delivery. Pahlka advocates for a shift towards user-centered design, agile development methodologies, and the cultivation of in-house technical expertise to create a more responsive and efficient government. By highlighting case studies and

her own experiences, she provides a roadmap for modernizing government services to better meet the needs of citizens in the digital age.

Government Documents

Congressional Research Service. (2022, December 29). *The OPEN Government Data Act: A Primer* (IF12299). https://crsreports.congress.gov/product/pdf/IF/IF12299

The OPEN Government Data Act aims to improve transparency, accessibility, and public engagement by requiring federal agencies to make their data open by default. This means the data must be machine-readable, easily accessible, and reusable by the public and private sectors. The Act also supports evidence-based policymaking by promoting data sharing among agencies and improving data quality and governance practices. While the legislation offers significant benefits, there are concerns about data privacy and the potential misuse of sensitive information. Additionally, some agencies may struggle to implement the required changes due to limited resources and infrastructure. Overall, the Act represents a significant step toward enhanced data transparency but addressing privacy concerns and ensuring consistent implementation are crucial. Agencies are encouraged to invest in infrastructure, staff training, and robust privacy frameworks to maximize the benefits of open government data.

Executive Order No. 14110, 3 C.F.R. (2023, October 30). *Safe, secure, and trustworthy development and use of artificial intelligence*. https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

Executive Order 14110 establishes a comprehensive framework to ensure the safe, secure, and trustworthy development and use of artificial intelligence (AI) in the United States, balancing innovation with national security, privacy, civil rights, and economic interests. It mandates strict safety standards and testing for AI developers, especially those working on high-risk models, while also focusing on privacy protection through privacy-preserving research and guidelines for handling personal data. The order promotes fairness in AI development by addressing algorithmic discrimination in key sectors like justice, healthcare, and housing. Workforce protection is emphasized, with guidelines to mitigate job displacement and ensure fair labor standards. To maintain U.S. leadership in AI, the order encourages innovation, supports small businesses, and promotes collaboration on international AI standards. However, challenges may arise in balancing innovation with regulatory oversight, and there are concerns about potential delays due to the extensive safety measures required. The order aims to position the U.S. as a global leader in responsible AI development while addressing critical issues related to security, privacy, and the workforce.

Federal CDO Council. (2022). *Data Sharing Working Group findings and recommendations*. https://resources.data.gov/assets/documents/2021_DSWG_Recommendations_and_Findings_508.pdf

> The Data Sharing Working Group's findings emphasize the need for better coordination, governance, and infrastructure to improve data sharing across federal agencies. They advocate for standardized frameworks to facilitate collaboration and secure platforms to protect sensitive data while ensuring its ethical use. Additionally, the group stresses the importance of investing in

workforce training and enhancing data literacy to advance data-sharing capabilities. However, technical challenges, outdated infrastructure, and fragmented governance policies hinder smooth data sharing, raising concerns about privacy and the ethical handling of sensitive information. To address these issues, the group recommends adopting uniform data-sharing protocols, prioritizing data ethics, and improving staff training to enhance cross-agency collaboration and maximize the potential of shared federal data.

Federal CDO Council. (2023, November). *The progress and promise of federal enterprise analytics*. https://resources.data.gov/assets/documents/Enterprise-Analytics-Report-508-FINAL.pdf

Federal enterprise analytics programs are vital for enhancing how agencies utilize data to improve decision-making, streamline operations, and deliver better public services. These programs align data strategies with agency objectives, integrate mission data, and require investments in workforce capabilities, modern technology, and centralized data systems. Successful implementation depends on collaboration between Chief Data Officers (CDOs) and Chief Information Officers (CIOs). However, challenges such as siloed data systems, duplicated infrastructure, and cultural resistance must be addressed for agencies to fully realize the potential of enterprise analytics.

Federal Data Strategy. (n.d.). *FDS Framework: Mission, principles, practices, and actions.* Retrieved from https://strategy.data.gov/assets/docs/2020-federal-data-strategy-framework.pdf

The Federal Data Strategy (FDS) enhances data management across U.S. federal agencies by leveraging data to advance missions, improve services, and benefit the public. Guided by principles of ethical governance, conscious design, and a learning culture, the FDS emphasizes ethics, transparency, relevance, accountability, and continuous education. It includes forty practices to foster a data-driven culture, improve governance, and promote efficient, ethical use of data. Annual action plans outline measurable activities to implement these practices, aiming to improve decision-making and public outcomes.

Federal Data Strategy. (n.d.). *2021 Action Plan*. Retrieved from https://strategy.data.gov/2021/action-plan/

The 2021 Action Plan of the Federal Data Strategy identifies several key problems in federal data governance, including varying levels of data maturity across agencies, resource constraints, challenges in ensuring data quality and accessibility, difficulties in integrating data practices, and the need to balance privacy with transparency. To address these issues, the plan recommends enhancing data governance structures by setting measurable goals, conducting comprehensive assessments of existing data capabilities, and investing in workforce development through training programs. Additionally, it emphasizes the importance of improving data sharing practices

and collaboration among agencies, ensuring high data quality, and establishing frameworks that protect privacy while promoting transparency.

National Information Technology Research and Development Program. (2022, February). *Big data: Pioneering the future of federally supported data repositories* [Workshop Report]. Big Data Interagency Working Group, Laura J. Biven and Amy Walton, Co-chairs. https://www.nitrd.gov/pubs/NITRD-BDIWG-Workshop-FSDRs-2022.pdf

The workshop report emphasizes the importance of federally supported data repositories in enhancing data-intensive research and the need for a coordinated approach to improve their

effectiveness. Key points include the necessity for interoperability among repositories, partnerships with the scientific community to identify gaps, and the creation of a national-scale data ecosystem
for broader access. However, challenges like the need for trained personnel and ethical considerations regarding data sharing persist. Recommendations include fostering community collaboration, investing in workforce training, and ensuring continuous evaluation and improvement of these repositories to support scientific discovery and innovation.

National Science and Technology Council. (2023, March). *National strategy to advance privacy-preserving data sharing and analytics*. Report by the Fast-Track Action Committee on Advancing Privacy-Preserving Data Sharing and Analytics, Networking and Information Technology Research and Development Subcommittee. https://www.whitehouse.gov/wp-content/uploads/2023/03/National-Strategy-to-Advance-Privacy-Preserving-Data-Sharing-and-Analytics.pdf

The National Strategy to Advance Privacy-Preserving Data Sharing and Analytics establishes a framework to utilize privacy-preserving technologies for enhanced data sharing while protecting individual privacy rights. It highlights that privacy-preserving data sharing and analytics (PPDSA) can yield valuable insights while maintaining confidentiality. The strategy calls for robust governance to manage risks, interdisciplinary collaboration for effective technology development, and investment in technical standards. However, challenges include slow adoption due to limited understanding of privacy risks and concerns about potential misuse of data. Agencies should prioritize training, promote collaboration, and enhance PPDSA effectiveness.

Office of Management and Budget. (2003, May 29). Performance of commercial activities (Circular A-76, Revised) [Including technical corrections]. Retrieved from https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A76/a76_incl_tech_correction.pdf

The document Performance of Commercial Activities (Circular A-76, Revised), issued by the Office of Management and Budget (OMB), outlines the federal policy governing the performance of commercial activities within government agencies. It provides guidelines for determining whether specific activities should be performed by federal employees or outsourced to private sector contractors. The circular emphasizes the importance of competition to ensure cost-efficiency and effective delivery of services, detailing procedures for conducting public-private competitions and managing associated contracts. Additionally, it incorporates technical corrections to enhance clarity and implementation. This policy aims to optimize government operations while ensuring accountability and value for taxpayers.

Office of Management and Budget. (2020, November). Federal data strategy: Data skills catalog. Retrieved from https://resources.data.gov/assets/documents/fds-data-skills-catalog.pdf

The Federal Data Strategy: Data Skills Catalog provides a comprehensive framework for building data competencies across the federal workforce. It identifies key skills and knowledge areas necessary for effective data management, analysis, and use in decision-making within government agencies. The catalog is organized into categories, such as foundational data skills, technical skills, and data leadership, providing guidance on the specific training needs for roles ranging from general employees to specialized data professionals.

The document emphasizes the importance of aligning workforce development with federal data strategy goals, enabling agencies to harness data as a strategic asset. It also offers resources and

training recommendations to support the development of a data-literate workforce, fostering better policy decisions, operational efficiencies, and public service outcomes.

Office of Management and Budget. (2021, June). Data skills training program implementation toolkit (Version 1). Retrieved from https://resources.data.gov/assets/documents/Data_Skills_Training_Program_Implementation_Toolkit_Finalv1.pdf

The Data Skills Training Program Implementation Toolkit (Version 1) serves as a practical resource for federal agencies to establish and sustain effective data skills training programs. The toolkit provides step-by-step guidance on planning, developing, and implementing training initiatives aimed at enhancing data literacy and technical expertise within the federal workforce.

It outlines strategies for assessing organizational needs, designing training curricula, engaging stakeholders, and measuring program success. The document emphasizes the importance of tailoring training programs to meet specific agency missions and workforce requirements while fostering a culture of data-driven decision-making. Additionally, it includes templates, case studies, and best practices to support agencies in integrating data skills training into their broader workforce development efforts. This toolkit aligns with the goals of the Federal Data Strategy to empower a data-capable workforce for improved government performance and service delivery.

U.S. Congress. (2014, May 9). *Digital Accountability and Transparency Act of 2014* (Public Law 113-101). https://www.congress.gov/113/plaws/publ101/PLAW-113publ101.pdf

The DATA Act of 2014 enhances federal spending transparency by establishing financial data standards and improving public access to expenditure information. Building on the 2006 Federal Funding Accountability Act, it requires agencies to link expenditures to programs and create a searchable database on USASpending.gov for tracking spending. The Act simplifies reporting for fund recipients to reduce costs and improve clarity. However, implementation faces challenges, including agency capability gaps and resistance to process changes. Despite these hurdles, the Act advances transparent financial practices, urging agencies to adopt standards, train staff, and evaluate reporting effectiveness.

U.S. Congress. (2018). *Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act).* Congress.gov. https://www.congress.gov/115/statute/STATUTE-132/STATUTE-132-Pg5529.pdf

The Evidence Act of 2018 modernizes federal data management to support effective policymaking by requiring agencies to create plans addressing policy questions with relevant

data. It promotes transparency by mandating public access to non-sensitive data and designates Evaluation Officers to oversee evidence-building. While advancing a data-driven government, challenges like agency silos hinder collaboration. Agencies are urged to implement evidence plans, train staff in data literacy, and improve cross-agency cooperation to maximize data use.

U.S. Congress. (2019). *Grant Reporting Efficiency and Agreements Transparency (GREAT) Act of 2019*. Congress.gov. https://www.congress.gov/116/plaws/publ103/PLAW-116publ103.pdf

The GREAT Act of 2019 modernizes federal grant reporting by standardizing data requirements to enhance transparency and reduce administrative burdens. It mandates searchable, machine-readable data formats for efficient access and single-use reporting, improving public accountability.

While streamlining compliance costs and grant management, challenges include technological gaps and resistance to change in some agencies. The Act emphasizes adopting new standards, investing
in staff training, and ensuring infrastructure to support these processes, ultimately benefiting grant recipients and the public.

U.S. Congress. (2017). *Open, Public, Electronic, and Necessary Government Data Act*, H.R. 1770, 115th Congress. Retrieved from https://www.congress.gov/bill/115th-congress/house-bill/1770

The OPEN Government Data Act enhances transparency by requiring federal agencies to publish data in a standardized, machine-readable format by default. It establishes frameworks for comprehensive data inventories and promotes common standards for interoperability, improving efficiency and accessibility. Challenges include outdated systems, resource limitations, and privacy concerns. The Act advances government accountability and data usability, urging agencies to develop inventories, train staff, and address privacy issues.

U.S. Government Accountability Office. (2015, January 26). *Government Data Sharing Community of Practice: Panel Discussion on Data Sharing in Disaster Response and Recovery, Meeting Minutes, January 26, 2015*. Retrieved from https://www.gao.gov/assets/gao_blog/inline/669249.pdf.

On January 26, 2015, the U.S. Government Accountability Office (GAO) convened a panel discussion as part of its Government Data Sharing Community of Practice, focusing on data sharing in disaster response and recovery. The session featured representatives from the Department of Defense, Department of Housing and Urban Development, the White House Innovation for Disaster Response and Recovery Initiative, GAO, and MITRE. Discussions centered on the necessity for federal, state, and local entities to share data effectively to respond to disasters and provide essential assistance to affected individuals. Panelists addressed challenges in data sharing, such as the need for comprehensive and accurate information, and highlighted successful initiatives like New Orleans' open data platform and the federal disaster.data.gov website. The meeting underscored the importance of leveraging data and a skilled workforce to enhance emergency management and recovery efforts.

U.S. Government Accountability Office. (2015, July). *Hurricane Sandy: An Investment Strategy Could Help the Federal Government Enhance National Resilience for Future Disasters*. Report No. GAO-15-515. https://www.gao.gov/assets/gao-15-515.pdf

The GAO's July 2015 report on Hurricane Sandy evaluated federal efforts to enhance disaster resilience, focusing on five key programs: FEMA's Public Assistance (PA) Program, Hazard Mitigation Grant Program (HMGP), the Federal Transit Administration's Emergency Relief

Program, HUD's Community Development Block Grant-Disaster Recovery, and the U.S. Army Corps of Engineers' Hurricane Sandy Program. These programs funded measures such as property acquisitions, elevation of flood-prone structures, and flood barrier construction. Despite these efforts, state and local officials faced challenges, including complex application processes and difficulties coordinating across programs. The GAO recommended that FEMA address these challenges and that the Mitigation Framework Leadership Group (MitFLG) develop a comprehensive investment strategy to prioritize federal disaster resilience funding. The Department of Homeland Security supported these recommendations.

U.S. Government Accountability Office. (2015, October 22). *Emergency Management: FEMA Has Made Progress since Hurricanes Katrina and Sandy, but Challenges Remain*. https://www.gao.gov/assets/680/673418.pdf

In its October 2015 report, the U.S. Government Accountability Office (GAO) assessed the Federal Emergency Management Agency's (FEMA) progress since Hurricanes Katrina and Sandy, highlighting both advancements and ongoing challenges. The GAO acknowledged FEMA's improvements in national preparedness, particularly in identifying and addressing capability gaps through enhanced data collection and reporting. However, the report also identified persistent issues, such as the strain on local governments during recovery phases due to infrastructure damage and the increasing frequency and severity of disasters, which pose significant fiscal challenges. Additionally, the GAO noted that while FEMA has implemented verification controls to reduce improper payments, challenges in disaster response and recovery persist. The report underscores the importance of continuous improvement in FEMA's operations to effectively manage future disasters.

U.S. Government Accountability Office. (2015, December). *Hurricane Sandy: FEMA Has Improved Disaster Aid Verification but Could Act to Further Limit Improper Assistance.* Report No. GAO-15-15. https://www.gao.gov/assets/gao-15-15.pdf

In December 2014, the U.S. Government Accountability Office (GAO) released a report evaluating the Federal Emergency Management Agency's (FEMA) disaster aid verification processes following Hurricane Sandy. The GAO acknowledged FEMA's implementation of new controls since the mid-2000s, which improved the agency's ability to detect improper and potentially fraudulent payments. However, the report identified continued weaknesses, particularly in the validation of Social Security numbers. The GAO found that 2,610 recipients with potentially invalid identifying information received $21 million of the $39 million identified as at risk for improper or fraudulent payments. The report recommended that FEMA collaborate with the Social Security Administration to obtain additional data, collect information to detect duplicative assistance, and implement an approach to verify whether recipients have private insurance. FEMA concurred with these recommendations.

U.S. Government Accountability Office. (2020, December 16). *Data governance: Agencies made progress in establishing governance but need to address key milestones* (GAO-21-152). https://www.gao.gov/products/gao-21-152

The GAO report highlights progress in federal data governance but emphasizes the need to address milestones for effective oversight. Agencies like Agriculture and Commerce have developed data quality plans aligned with OMB guidance, yet outdated systems and inconsistent implementation hinder compliance. The report calls for comprehensive governance plans, staff

training to enhance data literacy, and consistent monitoring. It also urges the OMB to foster inter-agency collaboration to strengthen governance efforts.

U.S. Government Accountability Office. (2023, May 24). *Government performance management: Leading practices to enhance interagency collaboration and address crosscutting challenges* (GAO-23-105520). https://www.gao.gov/products/gao-23-105520

The GAO report highlights the need for improved interagency collaboration to address complex challenges. It identifies eight key practices, including defining common outcomes, ensuring accountability, and bridging organizational cultures. Clear communication and trust-building are essential, but bureaucratic resistance and lack of incentives can hinder progress. The report

recommends adopting these practices, fostering relationships, and regularly evaluating collaboration to enhance federal effectiveness in addressing cross-domain issues.

U.S. Government Accountability Office. (2023, June 14). *2023 Annual Report: Additional opportunities to reduce fragmentation, overlap, and duplication and achieve billions of dollars in financial benefits* (GAO-23-106089). https://www.gao.gov/products/gao-23-106089

The 2023 GAO Annual Report highlights opportunities to reduce program duplication, potentially yielding significant savings. It identifies 100 recommendations to improve efficiency, with prior actions saving $600 billion since 2011. Potential savings include health program payments and broadband strategies. Challenges include agency resistance and inconsistent adoption. The report urges Congress and agencies to prioritize these recommendations and continuously evaluate efforts to minimize overlap and enhance services.

U.S. Government Accountability Office. (2023, November 7). *Federal spending transparency: Opportunities to improve USAspending.gov data* (GAO-24-106214). U.S. Government Accountability Office. Retrieved from https://www.gao.gov/products/gao-24-106214.

The report highlights opportunities to improve data completeness and accuracy on USAspending.gov, noting gaps due to 49 agencies not reporting and discrepancies in COVID-19 spending data. Ambiguities in reporting requirements and lack of clear oversight roles for Treasury and OMB further hinder transparency. To address these issues, the report recommends Congress amend the DATA Act to include OTAs and clarify oversight responsibilities. It also urges OMB to ensure consistency between USAspending.gov and other public data sources to build trust and improve spending oversight.

U.S. Office of Personnel Management. (n.d.). *Responsible use of generative artificial intelligence for the federal workforce*. https://www.opm.gov/data/resources/ai-guidance/

Guidance on generative AI (GenAI) for the federal workforce emphasizes its potential to boost productivity by automating tasks and enhancing communication. It highlights the need for employees to understand risks like accuracy, privacy, and bias. Recommendations include adhering to agency policies, ensuring human oversight, and maintaining ethical standards. Challenges include employee resistance and risks such as fabrications and security vulnerabilities. The guidance calls for continuous learning, proper oversight, and agency-provided resources to ensure ethical and effective AI integration.

U.S. White House. (2006, February 23). *The Federal Response to Hurricane Katrina: Lessons Learned.* Retrieved from https://georgewbush-whitehouse.archives.gov/reports/katrina-lessons-learned/.

In February 2006, the White House released "The Federal Response to Hurricane Katrina: Lessons Learned," highlighting significant shortcomings in preparedness, communication, and coordination among federal, state, and local agencies. It called for a unified national response framework, improved situational awareness, and enhanced logistics capabilities. Key recommendations included establishing a National Preparedness System, better integration of military resources, and stronger public communication strategies. The report also emphasized the role of non-governmental organizations and the private sector in disaster response, advocating systemic reforms to strengthen national resilience against future catastrophic events.

Interviews

Ballmer, S. (2019, April 30). *Interview at the Economic Club of Washington DC* [Interview]. Interviewed by David M. Rubenstein. https://www.youtube.com/watch?v=6Six_O2Ye00

In the interview, Steve Ballmer discusses his USAFacts initiative, highlighting the importance of making government data accessible and transparent. He emphasizes that presenting nonpartisan data on government finances helps citizens understand tax spending, fostering accountability and informed decision-making. Ballmer stresses that transparency empowers civic engagement by presenting unbiased government spending data based on official sources. He notes the complexity of aggregating federal, state, and local data, which can overwhelm the average person. He also addresses the federal deficit, attributing it to programs like Social Security, Medicare, and defense spending. Ballmer advocates for a balanced budget through spending cuts and revenue increases, despite political challenges. He recommends adopting corporate-style data management to enhance trust and transparency.

Ballmer, S. (2024, September 10). *Making government spending transparent with USAFacts* [Television interview]. In J. Stewart (Host), The Daily Show with Jon Stewart. Comedy Central. https://www.youtube.com/watch?v=PdX3nOo7BCQ

In this interview, Steve Ballmer discusses his USAFacts initiative, emphasizing transparency in government spending. USAFacts provides clear, nonpartisan data on tax collection and spending, empowering citizens to understand government operations and fostering accountability. Ballmer highlights that access to factual data helps people form opinions on tax dollar use without political bias. He acknowledges the complexity of government financial data and the risk of misinterpretation without proper context. He calls on individuals to use USAFacts to stay informed and advocates for simplifying government financial data to promote effective civic engagement and accountability in policymaking.

Bloomberg TV. (2024, June 12). *Steve Ballmer on importance of transparency in age of AI* [Television interview]. YouTube. https://www.youtube.com/watch?v=Vau0i-Ci3DU

In the interview, Steve Ballmer emphasizes the need for transparency in AI development and usage. He argues that transparent practices can build trust and mitigate risks associated with AI misuse, such as privacy violations and biased algorithms. However, he acknowledges that the early stages of AI technology make comprehensive regulation challenging, raising concerns about potential overregulation that could stifle innovation. Ballmer advocates for proactive legislation to address these issues while ensuring ethical accountability in AI initiatives.

Bloomberg. (2020, October 7). *Steve Ballmer's not-for-profit organization brings unbiased government data to Americans* [TV interview]. Interview with Poppy McDonald.

https://www.bloomberg.com/news/videos/2020-10-07/steve-ballmer-s-not-for-profit-organization-brings-unbiased-government-data-to-americans-video

In the interview, Poppy McDonald discusses the mission of USAFacts, the organization founded by Steve Ballmer. The main focus is on making government data accessible and understandable for the public. McDonald emphasizes that providing unbiased data helps citizens better understand government operations and promotes accountability. However, she acknowledges challenges in presenting the data clearly, which can be overwhelming for some. She recommends continued

efforts to simplify data presentation and engage the public with USAFacts as a reliable resource for understanding government spending and policies.

Podcasts

Corner Alliance. (2024, April 24). *AI in government: Current state and future potential with Nathan Manzotti of GSA* [Audio podcast episode]. In AI, government, and the future. https://podcasts.apple.com/us/podcast/ai-in-government-current-state-and-future-potential/id1707752659?i=1000653438949

In this episode, Nathan Manzotti, Director of Data Analytics and AI Centers of Excellence at the GSA, discusses AI's current and future role in the federal government. He highlights GSA's efforts to support AI adoption through training, communities of practice, and projects like USDA beef grading. Manzotti emphasizes collaboration among government, industry, academia, and nonprofits to drive responsible AI innovation. Key topics include AI's efficiency benefits, challenges in attracting AI talent to government, ethical concerns, and the need for robust governance. A recent AI Executive Order is seen as progress in workforce development and governance. Recommendations include expanding training, fostering cross-sector collaboration, and building knowledge-sharing communities.

Engaging Local Government Leaders Network. (2023, January 20*). Integrating data with Justin Elszasz, Baltimore, MD* [Audio podcast episode]. In GovLove Podcast. https://elgl.org/govlove/

Justin Elszasz, discusses the integration of data into local government operations, focusing on how data-driven approaches can enhance decision-making, service delivery, and efficiency. He highlights the collaborative efforts of the city's digital services team with various departments to implement impactful projects. The integration of data fosters improved decision-making, increases operational efficiency, and encourages interdepartmental collaboration. However, challenges such as data silos, talent shortages, and concerns about privacy and ethics pose hurdles to seamless implementation. Elszasz emphasizes the importance of preparing the next generation of data scientists for public service, developing strong data governance frameworks, and pursuing targeted initiatives with clear objectives and measurable outcomes to ensure that data integration leads to tangible benefits for residents.

Engaging Local Government Leaders Network. (2023, March 31*). Improving technology with Santi Garces, Boston, MA* [Audio podcast episode]. In GovLove Podcast. https://elgl.org/govlove/

Santi Garces, Chief Information Officer for the City of Boston, discusses how technology can transform local government, focusing on balancing multiple projects, closing the digital divide,

and utilizing data as both a platform and product. Garces emphasizes that reducing the digital divide is critical for fostering equity and inclusivity by providing better internet access to underserved communities. He highlights the role of data in driving innovation and improving city services, advocating for its use as a tool for efficiency and service improvement. However, challenges such as resource limitations, rapid technological changes, and equity concerns persist, particularly in ensuring equal access to technology for all residents. Garces recommends that city officials embrace flexibility and adaptability when managing technology projects, focusing on measurable outcomes that directly benefit the community, such as improved public services and reduced disparities in digital access.

Federal CDO Council. (2022, October 10). *Paving the road to the CDOC* [Audio podcast episode]. In Unstructured Data. Featuring Dan Morgan (Episode 1). https://www.cdo.gov/podcast/

In this episode, Dan Morgan, Chief Data Officer for the U.S. Department of Transportation, discusses the role of Chief Data Officers in the federal government, emphasizing how data supports critical transportation operations and safety. He highlights the work of the Federal CDO Council, which facilitates cross-agency data sharing and helps align government data strategies with the Evidence Act, which mandates evidence-based policymaking. Morgan advocates for using data to enhance decision-making and operational efficiency, noting the importance of collaboration between federal agencies and the private sector. However, he also acknowledges challenges, such as the complexity of integrating diverse data systems and the difficulty of attracting skilled data professionals to government roles. Morgan recommends promoting data as a career path in government and ensuring agencies comply with the Evidence Act to improve public service delivery through data-driven strategies.

Federal CDO Council. (2022, November 10). *Solving problems with data* [Audio podcast episode]. In Unstructured Data. Featuring Janice deGarmo (Episode 2). https://www.cdo.gov/podcast/

Janice deGarmo, former Chief Data Officer at the U.S. Department of State, discusses the role of data analytics in addressing complex challenges within the department and the broader federal government. She emphasizes how data enables evidence-based decision-making and improves operational efficiency. However, challenges like integrating diverse data sources and ensuring data quality across departments persist. DeGarmo recommends fostering a strong data culture within agencies and encouraging collaboration across departments to maximize the potential of data analytics for problem-solving and strategic planning.

Federal CDO Council. (2023, January 13). *Counting on the data* [Audio podcast episode]. In Unstructured Data. Featuring Oliver Wise (Episode 4). https://www.cdo.gov/podcast/

In this episode, Oliver Wise, Chief Data Officer at the U.S. Department of Commerce, discusses how data can drive government transformation and improve decision-making. He emphasizes the importance of cross-agency data sharing, which enhances coordination and leads to better policy outcomes. Wise highlights the potential of data analytics to solve complex challenges, such as improving performance management and accountability in government. However, he acknowledges the challenges of integrating diverse data sets across multiple agencies, particularly when dealing
with legacy systems or incompatible formats. Additionally, resource constraints, such as limited funding and technical expertise, can hinder the effective use of data in the public sector. Wise recommends promoting data-sharing initiatives, investing in modern data infrastructure, and

fostering a data-driven culture within federal agencies to maximize the potential of data for innovation and evidence-based policymaking.

Federal CDO Council. (2023, April 10). *Evolving with data* [Audio podcast episode]. In Unstructured Data. Featuring Dorothy Aronson (Episode 6). https://www.cdo.gov/podcast/

Dorothy Aronson, Chief Information Officer and Chief Data Officer at the National Science Foundation, discusses the evolving role of data in federal operations, focusing on balancing her dual responsibilities while adapting to the rapid changes in data management. She emphasizes how data can drive innovation and enhance decision-making within federal agencies. However, she also highlights the challenges of managing multiple roles and keeping pace with technological

advancements. Aronson recommends fostering adaptability within teams and improving data literacy to ensure effective data-driven decision-making across agencies.

Federal CDO Council. (2023, October 23). *Dr. Gil Alterovitz - Serving with AI and data: The Department of Veterans Affairs* (Episode 7) [Audio podcast episode]. In Unstructured Data. https://www.cdo.gov/podcast/

In this episode, Dr. Gil Alterovitz, Chief Artificial Intelligence Officer at the Department of Veterans Affairs (VA), discusses how AI and data are transforming healthcare services for veterans. The VA utilizes AI to enhance personalized care and improve healthcare outcomes by analyzing large datasets to predict patient needs. The conversation also highlights the work of the National Artificial Intelligence Institute (NAII), which spearheads AI innovations in mental health and preventive care. However, challenges such as ethical concerns regarding the use of AI in healthcare and managing sensitive data are addressed. Dr. Alterovitz emphasizes the importance of ethical AI governance, advocating for human oversight and cross-agency collaboration to ensure responsible AI deployment in public services.

GovEx. (2023, July 10). *Democratizing data in city workforces: A conversation with Baltimore Chief Data Officer Justin Elszasz* [Audio podcast episode]. In GovEx Data Points Podcast. https://govex.jhu.edu/govex-data-points/

In this episode, Justin Elszasz, Baltimore's Chief Data Officer, discusses the democratization of data within city workforces through initiatives like the Baltimore Data Academy. This program provides data literacy training to city employees at all levels, empowering them to make data-informed decisions and improve service delivery across departments. The initiative fosters a data-driven culture, enabling staff to use data to enhance government operations, from health services to inventory management. While the program empowers employees and improves efficiency, challenges such as resource limitations and resistance to change exist. Elszasz recommends scaling the training to ensure accessibility and emphasizes the need for leadership support to reinforce the importance of data literacy in public service.

GovEx. (2023, October 19). *A year in review: A conversation with GovEx Executive Director Amy Edwards Holmes on her first year of leadership* [Audio podcast episode]. In GovEx Data Points Podcast. https://govex.jhu.edu/govex-data-points/

In this episode, Amy Edwards Holmes, Executive Director of GovEx, reflects on her first year of leadership at the Bloomberg Center for Government Excellence. The conversation highlights GovEx's initiatives to help cities use data to improve public services through programs like the Bloomberg Philanthropies City Data Alliance. Holmes emphasizes the importance of empowering cities to make data-driven decisions, which can lead to more effective solutions in areas such as housing, transportation, and public health. She also discusses the challenge of scaling these data

practices across cities with varying levels of resources and expertise. Holmes recommends continuing to build partnerships between cities and data experts, providing tailored support to meet the unique needs of each municipality, and ensuring that data initiatives are sustainable and impactful in the long term.

GovEx. (2024, February 1). *City AI Connect: Risk vs. opportunity in government AI* [Audio podcast episode]. In DataPoints Podcast. https://govex.jhu.edu/govex-data-points/

In the episode, the discussion centers on how cities can use generative AI to improve public services, such as emergency response, infrastructure planning, and automating government processes to reduce delays. AI's ability to analyze large datasets can also enhance disaster preparedness and resource management. However, concerns are raised about data privacy, bias, and ethical considerations in AI use. Additionally, many local governments face challenges with limited expertise and resources in integrating AI. The episode recommends collaboration between city leaders and technology experts to ensure responsible AI implementation, providing tools and resources to help local governments navigate AI adoption effectively.

GovEx. (2024, April 15). *Teaching mayors to tap data's "sneaky super power": Bringing people together* [Audio podcast episode]. In GovEx Data Points Podcast. https://govex.jhu.edu/govex-data-points/

In this episode, the discussion highlights how city leaders can use data to connect communities and improve public services. The episode focuses on the Data Track within the Bloomberg Harvard City Leadership Initiative, which teaches mayors to leverage data for better collaboration and decision-making. By using data to identify community challenges, mayors can foster stronger relationships between residents and city leadership, ultimately improving service delivery. However, challenges such as data misinterpretation and resource limitations can hinder the effective use of data. The episode recommends ongoing data literacy training for city officials and emphasizes the importance of collaboration with experts to maximize the positive impact of data in governance.

GovEx. (2024, May 16). *Celebrating 10 years: Reflections on the DATA Act and the future of open data* [Audio podcast episode]. In GovEx Data Points Podcast. https://govex.jhu.edu/govex-data-points/

In the episode, the focus is on the impact of the DATA Act over the past decade, particularly its role in increasing government transparency by standardizing federal spending data. The episode highlights how the Act has enabled public access to track more than $6 trillion in federal funds annually, promoting greater accountability. While the DATA Act has set a global precedent for open data initiatives, challenges such as data quality and the complexity of coordinating between agencies remain. The episode recommends ongoing investment in data infrastructure, fostering inter-agency collaboration for consistent standards, and encouraging public engagement with open data tools to fully realize the benefits of transparency.

Harvard Kennedy School. (2023, July 5). *Recast - The intersection of privacy, technology, and bias* [Audio podcast episode]. In The Data-Smart City Pod. Featuring Dr. Latanya Sweeney. https://datasmart.hks.harvard.edu/podcast

In this episode, Dr. Latanya Sweeney discusses how data-driven technologies can either promote fairness or deepen societal inequities. She highlights the risks of biased data leading to biased outcomes in technology systems, stressing the importance of building inclusive and transparent services for cities. While data and technology can improve service efficiency and inclusivity, there are significant risks if biased or incomplete data is used, which can result in inequitable decisions affecting marginalized groups. Additionally, a lack of transparency in algorithmic decision-making can erode public trust. Dr. Sweeney recommends that cities manage data privacy carefully, actively work to prevent bias, and collaborate with technologists to build fair systems. She also advocates for regular audits of technology systems to avoid embedding bias into long-term strategies.

Harvard Kennedy School. (2023, July 26). *The Complicated Interplay: AI and Government* [Audio podcast episode]. In The Data-Smart City Pod. Featuring Dan Huttenlocher. https://datasmart.hks.harvard.edu/podcast

In this episode, Professor Dan Huttenlocher, dean of the MIT Schwarzman College of Computing, explores how generative AI can enhance government operations and service delivery. The discussion emphasizes AI's potential to streamline processes, improve resource management, and provide predictive analytics for better decision-making. However, Huttenlocher also addresses concerns about AI's ethical implications, including bias, fairness, and accountability, which require careful oversight. He recommends that governments develop transparent frameworks and operational standards to ensure the responsible use of AI, balancing efficiency with ethical considerations through human oversight.

Harvard Kennedy School. (2023, September 6). *Leading first and leading local with Clarence Anthony* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

In this episode, Clarence Anthony, CEO and Executive Director of the National League of Cities, discusses how local governments often take the lead in driving technological innovation, promoting racial equity, and ensuring accessibility. He emphasizes that local governments are uniquely positioned to respond quickly to community needs and pilot innovative solutions. However, challenges such as resource limitations and inconsistent implementation across different cities can hinder progress. Anthony highlights the importance of data-driven decision-making to ensure equitable policies and urges city leaders to collaborate and share resources to enhance success.

Harvard Kennedy School. (2023, September 27). *How to Responsibly Navigate Government's AI Frontier* [Audio podcast episode]. In The Data-Smart City Pod. Featuring Luis Videgaray. https://datasmart.hks.harvard.edu/podcast

In this episode, Luis Videgaray, Director of the MIT AI Policy for the World Project, discusses the integration of artificial intelligence (AI) in government systems, focusing on the balance between AI's potential and the ethical concerns it raises. Videgaray highlights the efficiency gains AI can bring by automating routine tasks, improving data analysis, and enhancing public services. However, he also
warns of the risks associated with bias in AI systems, especially in sensitive areas like law enforcement, where biased data can lead to unfair outcomes. He emphasizes the importance of ethical frameworks, transparency, and regulatory oversight to ensure responsible AI use in government. Videgaray recommends that government leaders be actively engaged in AI procurement, ensuring that AI aligns with long-term goals and that human oversight remains central to mitigate risks.

Harvard Kennedy School. (2024, January 3). *Recoding America: Author interview with Jennifer Pahlka* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

> In this episode, Jennifer Pahlka, founder of Code for America and former U.S. Deputy Chief Technology Officer, discusses her book Recoding America. The conversation centers on the failures of government technology projects due to outdated processes and a lack of alignment between technology and policy. Pahlka advocates for simplifying bureaucratic systems to improve public services and stresses the importance of collaboration between tech experts and policymakers. While innovation can drive better outcomes, challenges such as government resistance to change

and the complexity of existing systems pose significant obstacles. Pahlka recommends rethinking investment strategies and fostering cross-disciplinary teams to streamline government services for citizens.

Harvard Kennedy School. (2024, January 31). *The essential capabilities for problem-oriented governance* [Audio podcast episode]. In The Data-Smart City Pod. Featuring Jorrit de Jong. https://datasmart.hks.harvard.edu/podcast

In this episode, Jorrit de Jong, director of the Bloomberg Center for Cities at Harvard University, discusses the key capabilities that governments need to tackle complex urban challenges. He emphasizes the importance of collaborative capability, data-analytic capability, and reflective-improvement capability in addressing large-scale problems like homelessness. Collaboration across sectors allows governments to pool resources and expertise, while data analytics help make informed decisions. The reflective-improvement capability ensures that governments can adapt and refine their policies based on real-time feedback. However, de Jong also acknowledges challenges, such as the difficulty of implementing these capabilities due to resource limitations and integrating data from multiple sources. He recommends that governments focus on building these capabilities incrementally, starting with cross-sector collaborations and improving data-sharing practices.

Harvard Kennedy School. (2024, February 12). *Tackling homelessness with strategic data and skills* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

In this episode, Carin Clary, Director of Homelessness and Housing at Harvard's Government Performance Lab, discusses how real-time data can address homelessness. She highlights its role in guiding interventions, streamlining response systems, and developing long-term solutions. Data helps identify root causes and optimize resources, particularly for high-utilizer populations. Cross-sector collaboration between housing, healthcare, and criminal justice also improves outcomes for individuals leaving institutions. Challenges include systemic inefficiencies, manual housing processes, and fragmented services due to poor data-sharing frameworks. Clary suggests investing in real-time data platforms, streamlining housing placement, training frontline workers in data literacy, and integrating discharge planning to prevent homelessness after institutional release.

Harvard Kennedy School. (2024, April 24). *Future tides: How Kaua'i fights sea level rise with data* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

In this episode, Alan Clinton, administrative planning officer for Kaua'I, discusses the island's proactive approach to addressing the threat of sea level rise. The focus is on the Sea Level Rise

Constraint District Viewer, a data visualization tool that projects future flooding and erosion hazards. This tool enables more precise planning, helping policymakers prioritize areas that need protection or adaptation. Kaua'I's use of data provides a blueprint for other coastal communities, showcasing how integrating data into policy-making can enhance climate resilience. However, implementing and maintaining such advanced tools can be resource-intensive, posing challenges for less financially equipped communities. Additionally, while the tool aids decision-making, long-term infrastructure planning still faces challenges, including funding and political support. Clinton advocates for continued investment in such data tools and encourages coastal areas to adopt similar approaches while fostering collaboration between governments and experts.

Harvard Kennedy School. (2024, May 15). *From intent to impact: Mayor Victoria Woodards on equity* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

In this episode, Tacoma Mayor Victoria Woodards shares her approach to embedding equity into all aspects of municipal operations, focusing on the Tacoma Equity Index. This tool uses data to identify disparities across neighborhoods, enabling the city to prioritize resources for areas with lower opportunities. For example, the Index informs decisions on streetlight repairs and park investments, ensuring that underserved communities are given the attention they need. Woodards emphasizes the importance of data-driven decision-making, supported by direct community engagement, such as participatory budgeting, which allows residents to decide how funds are allocated in their districts. However, challenges include the resource-intensive nature of implementing equity initiatives across various departments and addressing the complex needs of neighborhoods that require a combination of housing, social services, and infrastructure improvements. Woodards recommends continuous community engagement and the integration of equity into everyday city operations, urging all departments to develop racial equity action plans to ensure equity becomes a fundamental part of decision-making.

Harvard Kennedy School. (2024, June 5). *A local approach to improving urban air quality* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

In this episode, Michael Ogletree, Division Director of Air Pollution Control for Colorado, discusses Denver's efforts to improve air quality using innovative, cost-effective technology. The Love My Air program, which places low-cost air quality sensors in public schools, aims to monitor pollution levels and reduce asthma rates among children. The program highlights the benefits of real-time data and community engagement, enabling schools and neighborhoods to take proactive measures to reduce pollution exposure. While low-cost sensors provide broader data coverage, they may not match the accuracy of high-end systems, leaving potential gaps in air quality assessments. Implementing such programs also requires significant investment in technology and outreach, which can be a challenge for underfunded cities. Ogletree recommends expanding the use of real-time, localized data and engaging communities to develop effective, data-driven solutions for improving urban air quality.

Harvard Kennedy School. (2024, June 10). *Leveraging data for healthier neighborhoods* [Audio podcast episode]. In The Data-Smart City Pod. Featuring Kate Robb. https://datasmart.hks.harvard.edu/podcast

In this episode, Kate Robb discusses how city governments can use data to improve public health by addressing the link between housing conditions and health outcomes. The conversation focuses on initiatives in cities like Chelsea, MA, and Buffalo, NY, where data-driven housing inspections and collaborative programs such as Clean Sweep are employed to mitigate public

health risks caused by substandard housing. Robb highlights the benefits of using data to identify at-risk neighborhoods, enabling proactive interventions that enhance community well-being. However, she notes challenges such as the resource-intensive nature of implementing these programs and concerns about data privacy when integrating information across sectors. Robb recommends that cities invest in real-time data platforms and foster cross-sector collaboration to effectively address the complex relationship between housing and health.

Harvard Kennedy School. (2024, July 24). *Good data, better technology, best practices: How LA Metro uses GIS* [Audio podcast episode]. In The Data-Smart City Pod. https://datasmart.hks.harvard.edu/podcast

> In this episode, Anika-Aduesa Smart, director of GIS at LA Metro, discusses how geographic information systems (GIS) enhance decision-making and operational efficiency within the organization. The episode focuses on the OneMAP platform, built on the ArcGIS system, which integrates spatial data with other workflows to improve collaboration and data accessibility across various departments. One of the key benefits of this platform is its ability to foster cross-department collaboration, allowing employees to use geospatial data more effectively and make data-driven decisions. Additionally, democratizing data by making GIS accessible to all employees empowers staff to integrate spatial insights into their daily tasks. However, challenges include the complexity of integrating GIS into workflows, as well as the ongoing challenge of maintaining accurate geospatial data, where errors could lead to flawed decision-making. Smart recommends investing in employee training and ensuring high data quality while promoting best practices in data governance to sustain the benefits of GIS technology.

Meyer, J. (2024, February 19). *Unlocking AI in the public sector* [Audio podcast episode]. In From Data Science Leaders. https://podcasts.apple.com/us/podcast/unlocking-ai-in-the-public-sector/id1564587119?i=1000645848226

> In this episode, Joel Meyer, former head of strategy at the Department of Homeland Security (DHS), discusses how AI is being applied to enhance government services and improve public safety. He highlights the potential of AI to address significant issues such as fentanyl trafficking and child exploitation, while emphasizing the steps the federal government is taking to scale AI capabilities across agencies. Meyer points out the benefits of AI in improving mission effectiveness, making operations more efficient, particularly in areas like public safety. However, he also stresses the importance of responsible AI practices, ensuring transparency and fairness in AI applications within the public sector. Challenges include the complexity of scaling AI across agencies and managing risks associated with sensitive data. Meyer recommends the development of responsible AI frameworks that emphasize transparency and accountability, while building public trust. He suggests using AI not only to improve efficiency but also to address ethical concerns through strong governance structures.

Whitlock, A. (Host). (2024, August 28*). AI regulation and government adoption: Insights from Dean Ball of Mercatus Center* [Audio podcast episode]. In AI, government, and the future. Corner Alliance. https://podcasts.apple.com/us/podcast/ai-regulation-and-government-adoption-insights-from/id1707752659?i=1000666911170

> Dean Ball, Research Fellow at the Mercatus Center, discusses the challenges of regulating AI and its adoption in government. He warns against premature legislation, advocating for flexible, use-

based regulations that evolve with AI technology. Regulatory uncertainty has slowed AI adoption in government, but carefully tailored rules could enhance efficiency and service delivery. Ball recommends focusing on specific use cases, measuring AI's success through public service improvements, and fostering collaboration among policymakers, technologists, and legal experts to create adaptable regulations for the fast-changing AI landscape.

Presentations

Ballmer, S. (2017, March 30). *Our nation, in numbers* [TEDx Talk]. In TEDxPennsylvaniaAvenue. https://www.youtube.com/watch?v=1VRgmKiE0Js

In his TEDx Talk, Steve Ballmer highlights the importance of accessible government data and introduces USAFacts, a platform providing nonpartisan, reliable information on tax collection and spending. He emphasizes that understanding government data fosters informed public debates on critical issues like education, healthcare, and infrastructure. Ballmer underscores the value of transparency, enabling citizens to hold the government accountable. While acknowledging the complexity of over 90,000 government jurisdictions, he argues that organizing data around the U.S. Constitution's preamble makes it more comprehensible. He encourages citizens to engage with this data, especially on Tax Day, to better understand government operations and make informed decisions.

Ballmer, S. (2017, November 29). *Digging into the data to understand our government* [Presentation]. Presented at the Stanford Institute for Economic Policy Associates Meeting. https://www.youtube.com/watch?v=_UB-pONvLvw

Steve Ballmer highlights the need for accessible, transparent government data through his USAFacts initiative, which provides nonpartisan insights into tax collection and spending. He emphasizes that clear, reliable data is essential for holding the government accountable and fostering informed public debate. Ballmer argues that transparency promotes civic participation, with USAFacts offering unbiased data from official sources. However, he notes challenges such as the complexity of government data and difficulties in interpretation without expertise. His main recommendation is to present government data in a structured, accessible way, akin to business financial reporting, encouraging citizens to use platforms like USAFacts to better understand government operations and engage in democracy.

National Interoperability Collaborative. (2019, June 28). *Interoperability and data-sharing - LGT Call* [Presentation]. Let's Get Technical Group. https://hub.nic-us.org/groups/let-s-get-technical/videos/interoperability-and-data-sharing-nic-let-s-get-technical-call-ju

The webinar highlights the importance of data interoperability in improving service delivery, especially in health and human services. Effective data-sharing enhances care coordination, enabling agencies to make informed decisions and develop better policies, leading to improved outcomes. Challenges include privacy and security concerns when sharing sensitive information and technical difficulties in integrating systems and standardizing data. Solutions include establishing governance frameworks, building trust among organizations, ensuring compliance with privacy rules, and providing ongoing staff training to support interoperability efforts.

National Interoperability Collaborative. (2020, January 31). *Transforming your data into impact* [Presentation]. Let's Get Technical Group. https://hub.nic-us.org/groups/let-s-get-technical/videos/transforming-your-data-into-impact-lgt-call-013120

The presentation focuses on using data to improve outcomes in health and human services. Emphasizing interoperability and data sharing, it highlights how actionable insights enhance decision-making and service delivery. Challenges include data privacy concerns, integrating systems, cultural resistance to data-driven approaches, and fears over data control. To overcome these, the speakers recommend clear governance frameworks, stakeholder collaboration, staff

training, and adopting a strategic view of data as a valuable asset, supported by investments in technology and practices.

National Interoperability Collaborative. (2020, March 6). *Addressing data collaboration challenges* [Presentation]. Let's Get Technical Group. https://hub.nic-us.org/groups/let-s-get-technical/videos/addressing-data-collaboration-challenges-lgt-03-06-2020

The presentation highlights challenges in sharing and integrating data across sectors, emphasizing its importance for improving service delivery in health and human services. Effective collaboration enables better insights, targeted interventions, and efficient resource allocation by creating a comprehensive view of individuals and communities. Key obstacles include complex data-sharing agreements, differing legal and technical standards, and privacy concerns. Solutions include establishing governance structures with diverse stakeholders to build trust, creating data trusts for secure sharing, and providing staff training to foster collaboration and innovation.

Reports

Aksamitauskas, M., & State Chief Data Officers Network. (2023, December). *A guide to identity management: CDO insights brief*. Beeck Center for Social Impact + Innovation. https://beeckcenter.georgetown.edu/report/a-guide-to-identity-management-cdo-insights-brief/

This brief underscores the importance of effective identity management in government operations, highlighting its role in improving service efficiency and security. Proper identity management accelerates service delivery, reduces bureaucratic burdens, and enhances security by linking digital identities to personal data, mitigating risks like fraud. Challenges include the high costs of implementing robust systems and resistance to transitioning from traditional methods. To address these, the brief recommends collaboration between technologists and data officials, clear data privacy protocols, investment in data quality, and adopting standards to ensure interoperability. These steps can build public trust and meet constituent needs.

Aksamitauskas, M. (2024, May 28). State data-maturity assessment: Helping data leaders track and evaluate the progress of data strategies in states. Beeck Center for Social Impact + Innovation. Retrieved from https://beeckcenter.georgetown.edu/report/state-data-maturity-assessment/

This document discusses enhancing data maturity in state governments through structured assessments to identify strengths, weaknesses, and areas for improvement in data strategies. The assessment provides a comprehensive view of data capabilities, aligning practices with strategic goals to support governance. Challenges include resource constraints and varying effectiveness based on states' current capabilities and engagement levels. To overcome these,

states are encouraged to actively use the assessment, foster data literacy, provide staff training, and promote inter-agency collaboration to implement findings and build cohesive data strategies.

Altarum, & Child Trends. (2021, March). Coordinating data sharing across agencies: Strategies to address common challenges. U.S. Department of Health and Human Services, Health Resources and Services Administration. Retrieved from https://mchb.hrsa.gov/sites/default/files/mchb/programs-impact/coordinating-across-agencies.pdf

This document emphasizes the importance of effective data interoperability among state agencies to enhance service coordination, especially in programs like the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program. Key advantages include increased efficiency in data collection and improved understanding of the families served. However, challenges such as securing leadership commitment and the complexity of establishing data sharing agreements can hinder progress. Recommendations include developing clear goals, aligning privacy and security requirements, and involving legal counsel early in the process.

Bureau of Justice Assistance. (n.d.). *NIEM case studies: Unifying information exchange*. Office of Justice Programs. Retrieved from https://bja.ojp.gov/sites/g/files/xyckuh186/files/media/document/NIEM_case_studies_Unify.pdf

The publication NIEM Case Studies: Unifying Information Exchange showcases how the National Information Exchange Model (NIEM) has been utilized to streamline and standardize data exchange processes across various justice and public safety organizations. The case studies illustrate successful implementations of NIEM to improve interoperability, enhance decision-making, and promote collaboration among agencies. This resource highlights the model's potential to address data-sharing challenges while maintaining security and efficiency.

Centers of Excellence. (2024, September 23). *AI guide for government: A living and evolving guide to the application of artificial intelligence for the U.S. federal government*. https://coe.gsa.gov/ai-guide-for-government/

This report explores integrating AI in federal agencies, focusing on its potential, challenges, and the need to build robust capabilities. AI can improve decision-making with data-driven insights, enhance efficiency, and automate routine tasks. However, challenges include integrating AI into existing systems, addressing ethical concerns like privacy and bias, and ensuring data security. The report recommends starting with capability assessments and identifying practical AI use cases. Fostering innovation, collaboration, and creating governance frameworks are key to ethical and transparent AI use. Continuous workforce training is also essential to keep up with technological advancements.

Data Quality Campaign. (2023, July). Building and sustaining Statewide Longitudinal Data Systems (SLDS). Retrieved from https://dataqualitycampaign.org/wp-content/uploads/2023/04/DQC-SLDS-fact-sheet.pdf

The Statewide Longitudinal Data Systems (SLDS): Fact Sheet highlights the importance of SLDS in improving education and workforce outcomes. It explains how SLDS integrates data from early childhood, K-12, postsecondary education, and workforce systems to create a comprehensive picture of individual and institutional performance over time.

The fact sheet emphasizes the benefits of SLDS, including enabling policymakers and educators to make data-informed decisions, evaluating program effectiveness, and identifying opportunities for improvement. It also discusses the challenges of implementing and maintaining these systems, such as ensuring data privacy, fostering cross-agency collaboration, and securing sustainable funding. By providing insights into the role and impact of SLDS, the document advocates for continued investment and support to maximize the potential of these systems in driving positive educational and workforce outcomes.

Evans, A., Jones, O., & Bradtke, T. (2021). *Four ways governments can use data to transform outcomes*. EY. Retrieved from https://www.ey.com/en_us/future-government/four-ways-governments-can-use-data-to-transform-outcomes.

This report emphasizes the importance of cultivating a culture that values data analytics in government operations. It outlines four key strategies: appointing a visionary leader to prioritize data initiatives, upskilling employees to enhance their confidence in using data insights, adopting an agile project approach for rapid learning and testing, and fostering partnerships to leverage relevant datasets. These steps aim to improve decision-making and service delivery, despite challenges related to data quality and resource constraints.

Federal Emergency Management Agency. (2024, September 23). State and Local Cybersecurity Grant Program: FY 2024 Fact Sheet. FEMA. Retrieved from https://www.fema.gov/grants/preparedness/state-local-cybersecurity-grant-program/fy-24-fact-sheet

The FY 2024 fact sheet outlines FEMA's State and Local Cybersecurity Grant Program, which provides financial assistance to enhance cybersecurity capabilities across state and local governments. The program focuses on mitigating cybersecurity risks, improving incident response, and fostering collaboration among government entities. It emphasizes the importance of adopting comprehensive cybersecurity strategies, enhancing workforce capacity, and promoting resilience against emerging threats. The fact sheet also includes details on eligibility, funding allocation, and key program goals.

FedScoop, StateScoop, & EY. (n.d.). *The forces driving data modernization for state and local government leaders*. EY. Retrieved from https://cdn.statescoop.com/forces-driving-data-modernization-study.pdf.

This report examines the challenges and opportunities that state and local public sector officials encounter in modernizing their data management practices. The primary discussion focuses on the necessity of effective data strategies to enhance service delivery and operational efficiency in government. Proponents of data modernization argue that it leads to improved decision-making by providing better insights and informed choices, ultimately resulting in more effective

government services. Additionally, modernizing data practices enhances collaboration between agencies, fostering a more integrated approach to public service delivery. However, the report also highlights significant challenges, including resource limitations, as many agencies face budget constraints that restrict their ability to invest in the necessary technology and training. Furthermore, there may be resistance to change among staff, which can hinder the adoption of new data practices and technologies. To address these issues, the report recommends that agencies develop clear data strategies, invest in workforce training, and engage stakeholders throughout the modernization process. Establishing governance frameworks that define roles and responsibilities is also crucial for effective implementation.

Garg, A., & Li, W. (2024, April 1). *The City of Santa Ana's website overhaul: A Digital Service Network spotlight*. Beeck Center for Social Impact + Innovation. https://beeckcenter.georgetown.edu/report/the-city-of-santa-anas-website-overhaul-a-digital-service-network-spotlight/

This report details the successful revamp of a city's outdated website, led by Daniel Soto. The project focused on user-centered design, improving accessibility, navigation, and centralized management. It fostered cross-departmental collaboration among 12 city departments and empowered employees to take ownership of content, boosting morale and engagement. Challenges included securing buy-in from the IT department due to concerns about scale, security, and cost, causing delays. Skepticism from city leadership was overcome by presenting a successful prototype. Iterative, user-centered design enabled continuous improvements, reducing the need for phone support as more residents used the updated FAQ section. The project serves as a model for cities to achieve digital innovation through collaboration and feedback-driven processes.

Gulati-Gilbert, S., & Seamans, R. (2023, May 9). *Data portability and interoperability: A primer on two policy tools for regulation of digitized industries*. Brookings Institution. Retrieved from https://www.brookings.edu/articles/data-portability-and-interoperability-a-primer-on-two-policy-tools-for-regulation-of-digitized-industries-2/

This report examines how data portability and interoperability can boost competition in digital industries. Data portability lets users transfer data between platforms, reducing switching costs, while interoperability enables seamless data exchange, preventing platform lock-in. These tools disrupt monopolies, promote consumer choice, and foster innovation. While they enhance competition and empower users, implementing these tools securely and intuitively poses challenges. Policymakers must address security risks and technical limitations. The report suggests applying these tools in sectors like banking and social media to encourage fair competition. Careful planning and funding are crucial to ensure effectiveness and maintain data security.

Gracie, M., Urbanczyk, M., White, M., & Kapaleeswaran, P. (2023, July 27). From data assets to data apps. Deloitte. Retrieved from https://www2.deloitte.com/us/en/insights/industry/public-sector/chief-data-officer-government-playbook/2023/cdo-playbook-data-products.html

The report advocates transforming how organizations, especially in the public sector, handle data. It suggests viewing data as dynamic products that can be turned into data apps using AI and advanced analytics to generate actionable insights, drive innovation, and improve outcomes. This approach enables better decisions, automates tasks, and enhances collaboration by making data more accessible. However, challenges include technological and cultural shifts, ensuring robust governance, and overcoming resistance to data sharing. The report recommends CDOs lead this shift by promoting data sharing and adopting "data mesh" architecture to decentralize ownership and enhance accessibility. Embracing these changes unlocks data's full potential.

Karkera, A., Kelkar, M., Mariani, J., & Nuttall, K. (2023). *Bridging the data-sharing chasm*. Deloitte Development LLC. https://www2.deloitte.com/us/en/industries/government-public-services.html

This report highlights the importance of data sharing in the public sector to improve decision-making and enhance services. By integrating information across departments, data sharing boosts efficiency, fosters collaboration, and supports innovation. Partnerships with businesses and nonprofits can address complex issues like public health and climate change. However, challenges include privacy risks, trust issues among stakeholders, and the complexity of establishing interoperable systems. The report recommends focusing on robust privacy measures, demonstrating the value of data-sharing initiatives, and starting with strategic, targeted implementations to build trust and momentum. This approach can enhance services while protecting privacy.

King, C. (2022, July 14). *Integrated early childhood data is an essential tool for advancing racial and ethnic equity*. Child Trends. Retrieved from https://www.childtrends.org/publications/integrated-early-childhood-data-is-an-essential-tool-for-advancing-racial-and-ethnic-equity.

This report highlights the importance of integrated early childhood data systems (ECIDS) in promoting racial and ethnic equity. By aggregating data across systems, policymakers can identify disparities in early childhood program access affecting marginalized groups and allocate resources more effectively. Integrated data enables analysis by race and ethnicity, fostering informed decisions and collaboration among policymakers, communities, and professionals to benefit diverse populations. Challenges include gaps in disaggregated data, the need for historical context to address systemic disparities, and privacy concerns when handling sensitive data. The report recommends disaggregating data, providing historical context, and involving communities throughout data collection and use to advance equity in early childhood services.

Lively, G. (2016, October 24). Data sharing across state agencies: Improving constituent services, enhancing policymaking & reducing costs [White paper]. CapTech. Retrieved from https://www.captechconsulting.com/articles/data-sharing-across-state-agencies-improving-constituent-services-enhancing-policymaking-and-reducing-costs

This white paper highlights the benefits of interagency data sharing for state governments, including improved service delivery through a better understanding of individual needs, informed policymaking, and cost reductions by eliminating redundant data systems. Challenges include privacy and security risks, outdated technology, and legislative barriers. The paper recommends clear governance frameworks, investment in interoperable technology, and showcasing successful case studies to address these issues. By overcoming these challenges, states can improve efficiency, policymaking, and cost-effectiveness.

School-Based Health Alliance. (2023). *Information sharing and confidentiality protection in SBHCs: A resource guide to HIPAA and FERPA*. Retrieved from https://sbh4all.org/wp-content/uploads/2023/10/Information-Sharing-and-Confidentiality-Protection-in-SBHCs-A-Resource-Guide-to-HIPAA-and-FERPA-2023.09.23-1.pdf

This resource guide provides comprehensive insights into the application of HIPAA and FERPA within school-based health centers (SBHCs). It emphasizes the importance of safeguarding students' health information while facilitating necessary information sharing to ensure effective care. The guide outlines the distinctions between HIPAA and FERPA, detailing their respective scopes and the types of information they protect. It clarifies which entities are governed by each law and under what circumstances, offering scenarios to illustrate when SBHCs might be subject to one or both regulations. Key topics include:

- Consent and Authorization The guide explains the requirements for obtaining consent to release health information, highlighting differences between consent for treatment and consent for information sharing.
- Parental Access: It discusses the conditions under which parents can access their minor children's health information and when such access may be restricted, considering both federal and state laws.
- Information Sharing Without Consent: The document identifies specific situations where protected health information can be shared without authorization, such as emergencies or when required by law.

Additionally, the guide addresses the interplay between federal and state laws, noting that state regulations may offer additional protections or stipulations regarding the confidentiality of student health information.

Strahm, L., & Houed, V. (2021, September). *Playbook for opening federal government data — How executive & legislative leadership can help*. Federation of American Scientists, Day One Project. https://fas.org/wp-content/uploads/2021/09/federal-data-playbook.pdf

This roadmap emphasizes making federal government data more accessible to drive research, innovation, and economic growth while enhancing decision-making. Open data fosters innovation, supports policymaking, and boosts U.S. competitiveness, particularly in data-reliant fields like AI. Challenges include limited funding, skilled personnel shortages, and privacy and security risks. The report recommends prioritizing open data as a Cross-Agency Priority (CAP) goal, appointing a Deputy CTO to lead efforts, and securing legislative support for funding and workforce development. Strong executive and legislative leadership is essential for success.

The Leadership Conference Education Fund. (2023, December). *Disaggregation nation: How data disaggregation can advance civil rights*. Retrieved from https://civilrights.org/edfund/wp-content/uploads/sites/2/2023/12/Disaggregation-Nation.pdf

The report examines how various states collect race and ethnicity data, particularly focusing on those that go beyond the federal standards set by the Office of Management and Budget (OMB) in 1997. As of September 2023, 12 states have implemented laws requiring more detailed data collection than the OMB's general categories. Notably, in 2023, Illinois, Massachusetts, and Nevada enacted such laws, reflecting a growing commitment to data disaggregation. Connecticut, Oregon, and Washington have the most comprehensive requirements, each mandating the collection of data on over 35 race and ethnicity subgroups. Massachusetts' recent legislation extends these requirements to all state agencies, not just those related to health care or public health. The report emphasizes that while many states lack specific laws for data disaggregation, ongoing advocacy and legislative efforts may lead to future progress. Detailed data collection is crucial for identifying and addressing health inequities and structural racism, enabling public health professionals to design effective and equitable interventions. Overall, the report underscores the importance of state-level initiatives in enhancing data collection practices to better reflect the diverse populations they serve, thereby advancing civil rights and promoting equity.

Wiseman, J. (2020). *Silo busting: The challenges and success factors for sharing intergovernmental data*. Ash Center for Democratic Governance and Innovation, Harvard Kennedy School. IBM Center for The Business of Government. Retrieved from https://www.businessofgovernment.org/report/silo-busting-challenges-and-successes-intergovernmental-data-sharing.

This report highlights the importance of data sharing among government levels to enhance service delivery, decision-making, and resource allocation. Integrating data across agencies can address complex issues like homelessness by offering a comprehensive view of individuals' needs across sectors such as housing, health, and employment. Examples like Virginia's COVID-19 dashboard and Allegheny County's data warehouse demonstrate how data sharing can improve crisis response and resource prioritization. Challenges include cultural resistance within agencies, as staff may cite

privacy concerns or statutory barriers to avoid sharing data. Addressing these issues requires strong leadership to navigate cultural obstacles, align processes, and manage long implementation timelines. The report recommends establishing governance frameworks, building data literacy, and securing funding for data initiatives. It emphasizes leadership at all levels to foster collaboration through shared standards and communities of practice. By overcoming these barriers, governments can better leverage data to deliver seamless, customer-focused public services.

World Economic Forum. (2022, June 17). *Unlocking the shared value of smart city data: A protocol for action*. World Economic Forum. Retrieved from https://www.weforum.org/publications/unlocking-the-shared-value-of-smart-city-data-a-protocol-for-action/.

This report explores the potential of smart city technologies and IoT to improve urban living. While these technologies generate vast amounts of data, their impact is limited by fragmented regulations, data silos, and privacy concerns. Effective data sharing could enhance services like transportation, waste management, and public health, improving residents' quality of life. The report highlights that smart city data can boost efficiency, foster innovation, and support economic growth through new business models. However, it warns of risks like privacy breaches and inconsistent regulations that limit data's value. To address these issues, the report recommends establishing governance frameworks for secure data sharing, trusted platforms, and regulatory models that encourage collaboration and unlock the full potential of smart city initiatives.

Videos

Ballmer, S. (2024, August 1). *Just the facts about the US economy: Steve Ballmer talks through the numbers* [Video]. YouTube. https://www.youtube.com/watch?v=zmlq5dl7fJ8

Steve Ballmer provides a factual overview of the U.S. economy, focusing on key indicators like GDP growth, inflation, wages, and income inequality. While unemployment is low and real GDP per capita hit a record high in 2023, rising costs for essentials have outpaced wage growth, straining households. Ballmer notes job growth with 3 million jobs added in 2023, raising the workforce to 159 million. Median wages increased by $8,250 since 2019, but inflation-adjusted gains are minimal. Housing costs rose 74% from 2010 to 2022, outpacing the 54% wage growth, and income inequality persists, with the top 1% far out-earning lower-income groups. He urges fact-based discussions about economic policies and recommends platforms like USAFacts for reliable data to help citizens understand inflation, wages, and government policies' impacts on living standards.

Ballmer, S. (2024, August 1). *Just the facts about US energy use, production, and environmental impact: Steve Ballmer talks through the numbers* [Video]. YouTube. https://www.youtube.com/watch?v=hCbUx_znoYg

Steve Ballmer analyzes U.S. energy trends, emphasizing the continued dominance of fossil fuels, which make up 82% of energy use, despite growth in wind and solar energy. He highlights the need to reduce reliance on fossil fuels and expand renewable energy to address environmental concerns. The video notes improved air quality in major cities and a 16% decline in greenhouse gas emissions since 2007, but progress remains slow, and the U.S. is still a major historical emitter as global emissions rise, particularly in China. Ballmer advocates for stronger government and industry efforts to promote renewable energy, citing the 2021 Inflation Reduction Act's tax incentives for clean

energy and EV adoption. He stresses the importance of continued investment in clean technologies and using climate data to guide policy decisions.

Ballmer, S. (2024, August 1). *Just the facts about the US federal budget: Steve Ballmer talks through the numbers* [Video]. YouTube. https://www.youtube.com/watch?v=aQoh9jdRZPM

Steve Ballmer reviews the U.S. federal budget, highlighting that in 2023, the government spent $6.2 trillion but collected only $4.5 trillion, resulting in a $1.7 trillion deficit. Key spending areas include Social Security, Medicare, Medicaid, and defense, while individual income taxes make up nearly half of federal revenue. Ballmer expresses concern over the rising national debt, which has grown by $24 trillion in 15 years, warning of potential long-term economic risks. He urges policymakers and the public to address these fiscal challenges using nonpartisan data, such as USAFacts, to balance spending and revenue for future stability.

Ballmer, S. (2024, August 1). *Just the facts about US immigration: Steve Ballmer talks through the numbers* [Video]. YouTube. https://www.youtube.com/watch?v=wt91pxCd0qA

Steve Ballmer examines U.S. immigration data, highlighting its significant contribution to population growth, with 1.1 million of 1.6 million new residents in 2022-2023 coming through immigration. He explains legal immigration pathways, such as work, school, and family visas, which accounted for over 2 million temporary visa holders in 2022, and discusses challenges related to unauthorized immigration, with 3.2 million border encounters in 2023. Ballmer underscores immigration's benefits, including its role in population growth and labor force support, while acknowledging issues around unauthorized immigration. He calls for informed discussions on immigration reform and border security, urging the use of accurate, nonpartisan data to guide meaningful policy conversations.

Early Childhood Technical Assistance Center. (n.d.). *Early Childhood Indicators and Data Systems (ECIDS)* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=KXdzXonne-o.

The video emphasizes the importance of integrating data systems to improve early childhood programs by tracking indicators like enrollment, health screenings, and developmental milestones. This comprehensive approach helps create policies tailored to children's needs, enhancing outcomes for families. Challenges include integrating data from multiple sources, privacy concerns, and resistance to data sharing. To address these issues, the video recommends a governance framework involving diverse stakeholders to build trust, ensure privacy, and promote collaboration. Ongoing training for staff and stakeholders is also crucial to maximize the effectiveness of these systems.

Virginia's Opioid Data Sharing and Analytics Platform. (n.d.). *YouTube*. Retrieved from https://www.youtube.com/watch?v=MEREsBkablI

The video highlights the development and application of the Framework for Addiction Analysis and Community Transformation (FAACT) in the Commonwealth of Virginia. The platform was designed to combat the opioid crisis by integrating data from multiple sources, including public safety, public health, and local governments. It provides stakeholders with real-time data and predictive analytics to support decision-making, allocate resources effectively, and develop community-specific interventions. The video showcases FAACT's role in improving coordination among agencies, fostering transparency, and delivering actionable insights to mitigate the impact of the opioid epidemic in Virginia.

Webinars

Global Government Forum. (2024, January 24). *Need for speed: Using real-time data to improve government delivery* [Webinar]. Global Government Forum. Retrieved from https://www.globalgovernmentforum.com/need-for-speed-using-real-time-data-to-improve-government-delivery/.

The webinar highlights the vital role of real-time data in improving government services and policy-making. By using current data, officials can better respond to citizens' needs and allocate resources effectively, as shown through case studies illustrating enhanced service delivery and policy
outcomes. Challenges include integrating diverse data sources, addressing privacy and security concerns, and ensuring rapid data analysis doesn't overlook crucial context. The webinar suggests governments establish policies to safeguard privacy, create collaborative frameworks for data sharing, and invest in technology and training to implement real-time data strategies successfully.

Websites

American Academy of Pediatrics. (n.d.). *HIPAA and FERPA basics*. Retrieved from https://www.aap.org/en/patient-care/school-health/hipaa-and-ferpa-basics/

The American Academy of Pediatrics provides an overview of the Health Insurance Portability and Accountability Act (HIPAA) and the Family Educational Rights and Privacy Act (FERPA), focusing on their application within school settings. HIPAA safeguards individuals' medical records and personal health information, while FERPA protects the privacy of student education records.

In schools, the applicability of these laws depends on the nature of the records and the entities handling them. Generally, health records maintained by educational institutions that receive federal funding are considered education records under FERPA and are exempt from HIPAA. However, if a healthcare provider operates independently within a school, their records may be subject to HIPAA.

Understanding the distinctions between HIPAA and FERPA is crucial for ensuring the confidentiality and proper handling of student health information in educational environments. This knowledge helps in maintaining compliance with federal regulations and protecting students' privacy rights.

American Legislative Exchange Council. (2021, August 25). The Privacy Protection Act. https://alec.org/model-policy/the-privacy-protection-act/

The Privacy Protection Act, published by the American Legislative Exchange Council (ALEC), is a model policy designed to safeguard personal data and ensure privacy rights in the digital age. It outlines principles and provisions to regulate the collection, use, and sharing of personal information by both public and private entities. The act emphasizes individual control over personal data, requiring transparency, consent, and data minimization practices.

Key provisions include granting individuals rights to access, correct, and delete their data, and mandating organizations to implement robust security measures to protect sensitive information. The policy also includes mechanisms for oversight and enforcement to ensure compliance.

ALEC's model aims to provide a framework for state legislatures to adopt privacy protections that balance individual rights with innovation and economic growth.

Aspen Institute. (n.d.). Urban innovation. Retrieved from https://www.aspeninstitute.org/topics/urban-innovation/

The Aspen Institute's Urban Innovation initiative focuses on addressing challenges and opportunities in urban environments through innovative solutions and collaborative strategies. The program explores how cities can leverage technology, data, and creative approaches to enhance sustainability, equity, and quality of life for residents. It emphasizes cross-sector collaboration, civic engagement, and the integration of new ideas to tackle pressing urban issues such as housing, transportation, and climate resilience. By convening experts, policymakers, and community leaders, the initiative aims to drive impactful change and promote inclusive, forward-thinking development in urban areas.

Bloomberg Philanthropies. (n.d.). What Works Cities. Retrieved from https://whatworkscities.bloomberg.org/

The What Works Cities initiative, launched by Bloomberg Philanthropies, helps U.S. cities improve their use of data and evidence to enhance decision-making, optimize resources, and deliver better services to residents. The program provides cities with technical assistance, training, and tools to develop data-driven solutions for pressing challenges. By fostering a culture of transparency, accountability, and innovation, What Works Cities aims to make cities more effective, equitable, and responsive. The initiative has impacted hundreds of cities, empowering them to use data to improve governance and quality of life.

California Business, Consumer Services and Housing Agency. (n.d.). *Acting to prevent, reduce and end homelessness. California Interagency Council on Homelessness*. Retrieved from https://bcsh.ca.gov/calich/hdis.html?utm_medium=Direct.

The California Business, Consumer Services and Housing Agency outlines its approach to preventing and ending homelessness through the California Interagency Council on Homelessness (Cal ICH). This initiative aligns state departments and stakeholders to create effective policies and collaborative frameworks. Key strategies include a statewide data system to track progress, aiming to make homelessness rare, brief, and one-time. The initiative addresses racial inequities and provides tailored services for subpopulations like families, veterans, and unaccompanied youth. Guided by an Action Plan, the council focuses on accountability and coordination among state entities, local governments, and community organizations. The plan is regularly updated to adapt to evolving needs and priorities.

California Health and Human Services Agency. (n.d.). *California Health and Human Services Open Data Portal. California Health and Human Services Agency*. Retrieved from https://data.chhs.ca.gov/.

The California Health and Human Services Open Data Portal is a centralized platform designed to enhance transparency and accessibility regarding health and human services data in California. Managed by the California Health and Human Services Agency, the portal provides public access to a wide array of datasets that cover critical areas such as healthcare outcomes, mental health, public health statistics, and social services. By enabling users to search for data by keywords, categories, or tags, the portal facilitates easy navigation and exploration of the available information. A key

objective of the portal is to promote transparency in government operations and support data-driven decision-making. It encourages community engagement by allowing users to download datasets for personal research or advocacy efforts. The platform features visualization tools that help users create graphs and charts, making the data more understandable and actionable. Regular updates ensure that the information remains current, reflecting ongoing efforts and developments in health and human services across the state.

Center for Open Data Enterprise. (n.d.). *Center for Open Data Enterprise (CODE). Center for Open Data Enterprise*. Retrieved from https://www.opendataenterprise.org/.

The Center for Open Data Enterprise (CODE) promotes the effective use of open data to drive innovation, enhance transparency, and support informed decision-making. Its website serves governments, non-profits, and businesses interested in leveraging open data for public benefit. Key features include initiatives to increase open data accessibility, foster cross-sector collaboration, and provide resources like reports, case studies, and guides on best practices. By highlighting success stories and encouraging community engagement, CODE builds a network of advocates and
practitioners. The organization also advocates for open data policies at all government levels and showcases innovative applications that drive social change, improve services, and inform public policy.

Centers for Disease Control and Prevention. (n.d.). *CDC's Data Modernization Initiative (DMI). Centers for Disease Control and Prevention*. Retrieved from https://www.cdc.gov/surveillance/data-modernization/index.html.

The CDC Data Modernization Initiative (DMI) aims to enhance the U.S. public health data infrastructure by improving the quality, speed, and usability of data for better decision-making and responses. It focuses on modernizing systems to ensure timely and reliable data collection, analysis, and sharing. Key goals include improving data interoperability, enhancing quality, and increasing public health capacity for data use. The CDC collaborates with state and local health departments, federal agencies, and private organizations to leverage diverse expertise and resources. The website offers toolkits, case studies, and reports on best practices and provides updates on progress and future plans, keeping stakeholders informed about the initiative's impact.

Centers for Disease Control and Prevention. (n.d.). Prescription drug monitoring programs (PDMPs). Retrieved from https://www.cdc.gov/overdose-prevention/php/interventions/prescription-drug-monitoring-programs.html

The Centers for Disease Control and Prevention (CDC) highlights the role of Prescription Drug Monitoring Programs (PDMPs) in combating opioid misuse and overdose. These state-run

electronic databases track controlled substance prescriptions to help healthcare providers identify risky prescribing patterns and prevent opioid overuse. By promoting data sharing across states and supporting informed decision-making, PDMPs play a critical role in enhancing patient safety and addressing the opioid crisis.

City and County of San Francisco. (n.d.). *DataSF. City and County of San Francisco Open Data*. Retrieved from https://datasf.org/opendata/.

The City and County of San Francisco's DataSF website is an open data portal designed to enhance transparency and public access to government information. It hosts thousands of datasets on city operations like public safety, transportation, housing, and health, each with metadata detailing its

source, update frequency, and uses. DataSF features a user-friendly interface, enabling users to search or filter datasets and access tools for visualizing trends and patterns. This supports journalists, researchers, and advocates in analyzing data for reports. The portal also encourages community engagement through feedback and dataset requests to keep the data relevant. Aligned with San Francisco's open government principles, DataSF aims to improve public trust and foster civic engagement by promoting transparency.

City of Chattanooga. (n.d.). *Chattanooga Open Data Portal. Chattanooga Public Library*. Retrieved from https://data.chattlibrary.org/.

The Chattanooga Open Data Portal, hosted by the Chattanooga Public Library, provides access to datasets on city operations and services, reflecting the city's commitment to transparency and civic engagement. The portal includes datasets on transportation, public safety, demographics, and environmental data. Its user-friendly design allows users to search, filter, and visualize information, with tools for creating charts and graphs, making it valuable for presenting data-driven insights. Focused on community engagement, the portal encourages residents to use data to advocate for change and participate in governance discussions. Regular updates ensure the data stays current and supports transparent government efforts.

City of Houston. (n.d.). *City of Houston Open Data. City of Houston*. Retrieved from https://data.houstontx.gov/.

The City of Houston Open Data Portal provides access to datasets on city operations, aiming to enhance transparency, foster civic engagement, and support data-driven decision-making. The portal offers datasets on topics like public safety, health, transportation, and housing. Its user-friendly interface allows users to search, filter, and view metadata, with tools for creating charts and maps to
visualize trends. A focus on community engagement encourages residents to explore city spending and participate in policy discussions. Regular updates ensure the data remains accurate and relevant, underscoring the city’s commitment to timely information.

City of Los Angeles. (n.d.). *Los Angeles Data Portal. City of Los Angeles Open Data*. Retrieved from https://data.lacity.org/.

The Los Angeles Data Portal provides public access to datasets on city operations, aiming to enhance transparency, accountability, and civic empowerment. Managed by the City of Los Angeles, it features thousands of datasets on topics like public safety, transportation, health, and housing. With a user-friendly design, the portal enables quick searches and filtering by categories or keywords. It includes data visualization tools for creating charts and maps, making complex trends accessible, especially for researchers and community advocates. The portal promotes community engagement by offering insights into government decisions and fostering informed

discussions. Regular updates ensure the data remains current, supporting transparency and active citizenship.

City of New York. (n.d.). *NYC Open Data. City of New York Open Data*. Retrieved from https://opendata.cityofnewyork.us/.

The NYC Open Data portal enhances transparency by providing access to over 1,500 datasets on topics like public safety, transportation, health, and education. It empowers residents, researchers, and businesses to use data for community planning and decision-making. The platform's user-friendly interface allows easy navigation and filtering by categories or keywords. Data visualization tools enable users to create charts, maps, and graphs, simplifying complex trends for analysts and

civic tech developers. The portal fosters community engagement by helping residents hold government agencies accountable and advocate for neighborhood improvements. Regular updates ensure access to accurate and relevant information.

Code for America. (n.d.). Automatic record clearance. Retrieved from https://codeforamerica.org/programs/criminal-justice/automatic-record-clearance/

The Automatic Record Clearance program by Code for America leverages technology to streamline the process of identifying and expunging eligible criminal records. Through open-source solutions like the Clear My Record platform, the initiative automates record clearance, reducing barriers for individuals seeking a fresh start. By partnering with governments, Code for America has transformed outdated, manual processes into efficient systems that improve access to justice and equity.

Code for America. (n.d.). Code for America. Retrieved from https://codeforamerica.org/

Code for America is a nonprofit organization dedicated to improving how government services are delivered to the public by leveraging technology, design, and data. It focuses on creating simple, effective, and user-centered digital tools to enhance accessibility and equity in public services. The organization partners with local, state, and federal governments to modernize systems, address inefficiencies, and make services more inclusive, particularly for underserved communities. Key initiatives include improving access to safety net programs, addressing criminal record expungement, and fostering civic engagement through technology. By advocating for digital transformation and user-first design, Code for America aims to make government services more effective and equitable for all.

Code for America. (n.d.). Integrated Benefits Initiative. Code for America. Retrieved from https://codeforamerica.org/programs/social-safety-net/integrated-benefits/

The Integrated Benefits Initiative by Code for America aims to streamline access to social safety net programs by modernizing and integrating benefits systems. The initiative focuses on improving the user experience for individuals applying for programs like SNAP, Medicaid, and TANF, ensuring they can access critical services quickly and efficiently. Through collaboration with government agencies, the initiative develops digital tools, simplifies application processes, and removes barriers that disproportionately impact vulnerable populations. By leveraging technology and user-centered design, the Integrated Benefits Initiative seeks to create a more equitable and accessible safety net system, enabling people to receive the support they need with less complexity and delay.

ConnectVirginia. (n.d.). *ConnectVirginia/Virginia Health Information Exchange (VHIE). Virginia Health Information*. Retrieved from https://www.vhi.org/connectvirginia/.

The ConnectVirginia website, part of Virginia Health Information (VHI), facilitates secure electronic sharing of medical data among healthcare providers to improve care quality and coordination. As a statewide Health Information Exchange (HIE), ConnectVirginia supports programs like the Emergency Department Care Coordination Program and the Advance Healthcare Directives Registry, ensuring providers have access to comprehensive patient data for effective care delivery. Since merging with VHI in July 2019, the organization has expanded resources for healthcare data collection and analysis, enhancing healthcare quality and making essential information accessible to consumers, insurers, and policymakers.

Digital Impact Alliance. (n.d.). Home. Digital Impact Alliance. Retrieved from https://dial.global/

> The Digital Impact Alliance (DIAL) is an initiative focused on leveraging digital technology to accelerate inclusive and sustainable development worldwide. It acts as a bridge between governments, private sector organizations, and development agencies, providing tools, resources, and strategies to maximize the impact of digital solutions. DIAL emphasizes the importance of open standards, shared infrastructure, and equitable access to technology to ensure that digital innovations benefit underserved populations. Through partnerships and knowledge-sharing, the organization supports scalable digital initiatives that address critical challenges in areas such as health, education, and economic development, fostering a more connected and inclusive world.

Duality Technologies. (n.d.). Differential privacy. Retrieved from https://dualitytech.com/glossary/differential-privacy/#:~:text=Differential%20Privacy%20adds%20noise%20to,results%20without%20identifying%20individual%20records

> Differential privacy is a technique designed to protect individual privacy within datasets by adding statistical noise to the data. This approach allows organizations to analyze and derive insights from aggregated data while ensuring that individual records remain unidentifiable. The methodology ensures a balance between privacy preservation and the utility of the data, enabling secure sharing and analysis for various applications, such as research, policy-making, and commercial uses.

Duke University. (n.d.). Security, privacy, and data science. Retrieved from https://cs.duke.edu/research/security-privacy-data-science

> Duke University's research in security, privacy, and data science focuses on developing technologies and methodologies that safeguard sensitive information while enabling advanced data analytics. This research encompasses areas such as cryptography, differential privacy, and secure multi-party computation. By addressing challenges at the intersection of data security and usability, Duke's work aims to enhance the ability of organizations to collaborate and analyze data without compromising privacy or security standards. The emphasis is on creating scalable and practical solutions that can be applied across various domains, including healthcare, finance, and governance.

Federal Bureau of Investigation. (n.d.). *National Data Exchange (N-DEx). Federal Bureau of Investigation*. Retrieved from https://ndex.fbi.gov/.

> The National Data Exchange (N-DEx), managed by the FBI, enhances information sharing among U.S. law enforcement and criminal justice agencies. This system integrates over 243 million

records, including incident reports and arrest data, allowing users to search, link, analyze, and share information across jurisdictions. Key features include real-time access to detailed data on individuals, locations, and events, as well as visualization tools that help identify connections and analyze crime trends. By securely facilitating interagency collaboration, N-DEx supports more effective and coordinated responses to criminal activity.

Federal Chief Data Officers Council. (n.d.). *Federal data strategy. U.S. Government*. Retrieved from https://strategy.data.gov/overview/.

The Federal Data Strategy (FDS) website aims to improve data management, sharing, and use across U.S. federal agencies over a ten-year vision. It focuses on enhancing government missions, public service, and resource management while safeguarding security, privacy, and confidentiality. A key goal is fostering data accountability and transparency by helping agencies improve data quality and embrace data-driven decision-making. The site offers action plans, resources, and best practices for Chief Data Officers (CDOs) to implement the strategy effectively. FDS also promotes collaboration among agencies and stakeholder engagement, breaking down silos to enhance data sharing and overall utility.

Federal Chief Information Officers Council. (n.d.). Data science training program. Retrieved from https://www.cio.gov/programs-and-events/data-science-training-program/

The Data Science Training Program, developed by the Federal Chief Information Officers Council, provides federal employees with foundational and advanced data science skills to enhance their ability to analyze and interpret data effectively. The program aims to strengthen the federal workforce's capacity for data-driven decision-making by offering a structured curriculum that covers topics such as data analysis, machine learning, visualization, and data ethics.

Designed for employees across various levels of technical expertise, the program includes self-paced learning modules, live training sessions, and collaborative projects. It emphasizes practical application by incorporating real-world examples relevant to government operations. This initiative supports the broader Federal Data Strategy by fostering a data-literate workforce capable of leveraging data as a strategic asset to improve public services and operational efficiency.

Federal Communications Commission. (n.d.). *Broadband Data Collection Program (BDC). Federal Communications Commission*. Retrieved from https://www.fcc.gov/BroadbandData.

The Broadband Data Collection (BDC) program, managed by the FCC, improves data on broadband availability and coverage in the U.S., enhancing the accuracy of the National Broadband Map to identify areas lacking high-speed internet. ISPs report broadband service availability, subscription data, and other metrics to help the FCC identify unserved and underserved areas for infrastructure investments. This data informs policymakers and the public about broadband access and the digital divide. The BDC also involves communities by enabling consumers and local governments to challenge and verify ISP-reported data, ensuring credibility and reliability for better planning and resource allocation.

Government of the District of Columbia. (n.d.). *Open Data DC. Government of the District of Columbia*. Retrieved from https://opendata.dc.gov.

The Open Data DC portal, launched by Washington, D.C., enhances transparency and accountability by offering public access to datasets on topics like public safety, transportation, health, and housing. With a user-friendly interface, users can easily navigate and filter datasets by categories, tags, or keywords. The platform also provides tools for creating visualizations like charts and graphs to identify trends and patterns. Encouraging community engagement, the portal helps residents explore government data, fostering informed civic discussions and public participation. Regular updates ensure datasets stay current and relevant, supporting the city's commitment to accessible information.

Harvard University Ash Center for Democratic Governance and Innovation. (n.d.). *Ash Center for Democratic Governance and Innovation*. Retrieved from https://cities.harvard.edu/

The Ash Center for Democratic Governance and Innovation at Harvard University promotes excellence in governance and strengthens democratic institutions. The center supports research, education, and practice aimed at improving public sector innovation, fostering civic engagement, and addressing global governance challenges. Through initiatives like the Civic Analytics Network, the Ash Center collaborates with city governments to advance data-driven decision-making and improve public services. By bridging academic expertise and practical solutions, the center seeks to enhance the effectiveness and accountability of governments worldwide.

Johns Hopkins University Center for Government Excellence (GovEx). (n.d.). Center for Government Excellence. Retrieved from https://govex.jhu.edu/

The Center for Government Excellence (GovEx) at Johns Hopkins University supports governments in leveraging data to improve decision-making, enhance public services, and

increase transparency. GovEx provides technical assistance, training, and tools to help local, state, and federal governments build data capacity and adopt evidence-based practices. The center also facilitates collaboration among governments and stakeholders, fostering innovative solutions to complex policy challenges. By empowering public sector leaders to use data effectively, GovEx aims to drive more equitable and efficient governance.

Knight Foundation. (n.d.). Smart cities. Retrieved from https://knightfoundation.org/smart-cities-2/

The Knight Foundation's Smart Cities initiative focuses on leveraging technology, data, and innovation to improve urban living and civic engagement. The foundation explores how cities can

responsibly adopt smart technologies to enhance public services, foster economic growth, and address social challenges. The initiative emphasizes collaboration among public, private, and nonprofit sectors to create equitable and transparent solutions that benefit all residents. By funding research and pilot projects, the Knight Foundation aims to ensure that smart city technologies align with community values and promote inclusivity.

Maryland Department of Housing and Community Development. (n.d.). Programs and services. Maryland Department of Housing and Community Development. Retrieved from https://dhcd.maryland.gov/Communities/Pages/programs/default.aspx

This webpage from the Maryland Department of Housing and Community Development provides an overview of programs aimed at supporting community development, affordable housing, and economic revitalization. The department offers initiatives that address housing affordability, neighborhood improvements, and financial support for low-income families and businesses. It also highlights partnerships with local governments and community organizations to implement projects that foster growth, sustainability, and equitable opportunities for residents across Maryland.

Massachusetts Executive Office of Technology Services and Security. (n.d.). Data sharing agreements in Massachusetts. Retrieved from https://www.mass.gov/info-details/data-sharing-agreements-in-massachusetts

The Massachusetts Executive Office of Technology Services and Security provides guidance on creating and managing data-sharing agreements in the state. These agreements are designed to facilitate secure and efficient sharing of data between government entities while ensuring compliance with applicable laws and regulations. The resource outlines key components of data-sharing agreements, including data governance, privacy protections, and operational best practices. It serves as a framework for enabling collaboration while safeguarding sensitive information.

National Center for Education Statistics. (n.d.). *Early Childhood Longitudinal Studies (ECLS). U.S. Department of Education*. Retrieved from https://nces.ed.gov/ecls/.

The Early Childhood Longitudinal Studies (ECLS) program, hosted by the National Center for Education Statistics (NCES), collects data to study child development, school readiness, and early school experiences from birth through elementary school. It includes multiple cohorts, such as the Kindergarten Class of 1998-99 and the Kindergarten Class of 2010-11, with the latest being the 2024 cohort. These studies help educators, policymakers, and families improve early education by analyzing factors like family, school, and community influences on children's development and academic performance.

National Civic League. (n.d.). All-America City Award. Retrieved from https://www.nationalcivicleague.org/america-city-award/

The All-America City Award, organized by the National Civic League, recognizes communities across the United States for their outstanding civic engagement, collaboration, and innovative approaches to address local challenges. This prestigious award celebrates cities, towns, counties, and regions that demonstrate strong cross-sector partnerships and inclusive efforts to improve the quality of life for residents.

The program highlights initiatives that promote equity, innovation, and grassroots involvement, showcasing how communities work together to create meaningful and sustainable impacts. Winners are honored for their ability to bring diverse groups together to solve problems, advance civic participation, and foster positive change. The award aims to inspire other communities to adopt similar collaborative and community-focused practices.

National Science and Technology Council. (2023). National Strategy to Advance Privacy-Preserving Data Sharing and Analytics. Office of Science and Technology Policy. Retrieved from https://www.whitehouse.gov/ostp/nstc

The National Science and Technology Council's 2023 "National Strategy to Advance Privacy-Preserving Data Sharing and Analytics" outlines a detailed plan to enhance data sharing and analytical capabilities while maintaining individual privacy. The strategy highlights the importance of privacy-preserving technologies in enabling secure and effective data collaboration across various sectors. It focuses on three key objectives: promoting research and development in technologies that facilitate data sharing without compromising privacy, encouraging the adoption and implementation of these methods in both public and private sectors, and establishing robust policy and governance frameworks to ensure ethical data use and protect individual rights. By addressing these areas, the strategy seeks to balance the benefits of data utilization with the critical need for privacy protection, fostering trust and collaboration in data-driven initiatives.

National Telecommunications and Information Administration. (n.d.). *Broadband Equity Access and Deployment Program (BEAD). U.S. Department of Commerce*. Retrieved from https://broadbandusa.ntia.doc.gov/funding-programs/broadband-equity-access-and-deployment-bead-program.

The Broadband Equity, Access, and Deployment (BEAD) Program, overseen by the National Telecommunications and Information Administration, allocates $42.45 billion to expand high-speed internet infrastructure across U.S. states, territories, and tribal lands. This program supports planning, infrastructure development, and adoption efforts to ensure equitable broadband access for all communities. It includes resources for state-level implementation, environmental reviews, and funding processes.

National Telecommunications and Information Administration. (n.d.). *Broadband Infrastructure Program (BIP). U.S. Department of Commerce*. Retrieved from https://broadbandusa.ntia.doc.gov/broadband-infrastructure-program.

The Broadband Infrastructure Program (BIP), managed by the National Telecommunications and Information Administration (NTIA), is a $288 million initiative aimed at expanding broadband access to underserved areas, particularly in rural regions. The program supports partnerships

between state or local governments and fixed broadband service providers to deploy high-speed internet infrastructure. The goal is to enhance broadband coverage in areas lacking sufficient connectivity.

Office of Head Start. (n.d.). *Head Start Program Information Report (PIR). U.S. Department of Health and Human Services*. Retrieved from https://eclkc.ohs.acf.hhs.gov/data-ongoing-monitoring/article/program-information-report-pir.

The Head Start Program Information Report (PIR) is a comprehensive data collection tool used by the Office of Head Start to track key metrics related to services, staff, children, and families involved in Head Start and Early Head Start programs across the U.S. The PIR data informs both federal and

local decision-making, helping to monitor program effectiveness and support accountability. It also provides insights into program operations and service outcomes.

Office of the National Coordinator for Health Information Technology. (n.d.). *The Trusted Exchange Framework and Common Agreement (TEFCA). U.S. Department of Health and Human Services*. Retrieved from https://www.healthit.gov/topic/interoperability/policy/trusted-exchange-framework-and-common-agreement-tefca.

The Trusted Exchange Framework and Common Agreement (TEFCA), overseen by the Office of the National Coordinator for Health IT, aims to create a standardized, secure, and interoperable system for nationwide health information exchange. TEFCA establishes a common set of principles and legal agreements to facilitate trusted data sharing across different health information networks. It supports various health exchange purposes, including treatment, public health, and individual access services, while ensuring strong privacy and security protections.

Office of Planning, Research, and Evaluation. (n.d.). *Child Care and Development Fund (CCDF) data. U.S. Department of Health and Human Services*. Retrieved from https://www.acf.hhs.gov/opre/project/child-care-and-development-fund-ccdf-policies-database.

The Child Care and Development Fund (CCDF) Policies Database, managed by the Office of Planning, Research, and Evaluation (OPRE), provides comprehensive data on state and territory policies related to childcare subsidies funded by CCDF. The database tracks policies such as eligibility, copayments, and provider reimbursement rates, helping inform stakeholders about childcare assistance trends and regulations.

Office of Planning, Research, and Evaluation. (n.d.). *National Survey of Early Care and Education (NSECE). U.S. Department of Health and Human Services*. Retrieved from https://www.acf.hhs.gov/opre/project/national-survey-early-care-and-education-2024.

The National Survey of Early Care and Education (NSECE) is a comprehensive study conducted by the Office of Planning, Research, and Evaluation to gather data on early care and education settings, workforce characteristics, and the families that utilize these services across the U.S. The 2024 edition continues efforts to inform policymakers, researchers, and educators about trends in early childhood education, access, and workforce development.

Ohio Department of Health. (n.d.). *Ohio Public Health Data Warehouse. Ohio Department of Health*. Retrieved from https://odh.ohio.gov/explore-data-and-stats/interactive-applications/ohio-public-health-data-warehouse1.

The Ohio Public Health Data Warehouse, hosted by the Ohio Department of Health, provides a platform for accessing a wide range of health-related data. It includes interactive tools for

exploring public health statistics on topics such as birth and death records, disease incidence, hospital utilization, and environmental health. This resource supports public health professionals, policymakers, and researchers in making data-driven decisions to improve health outcomes in Ohio.

Open Data Network. (n.d.). *Open Data Network. Open Data Network*. Retrieved from http://www.opendatanetwork.com/

The Open Data Network provides a platform for users to explore, publish, and interact with data across various domains such as finance, education, demographics, health, and more. It offers tools to analyze data and compare metrics across geographical regions, helping users answer specific questions about local or national trends. This resource is aimed at fostering transparency and accessibility in data-driven decision-making.

State of Utah. (n.d.). *Utah Open Data Catalog. State of Utah Open Data Portal*. Retrieved from https://opendata.utah.gov/.

The Utah Open Data Catalog provides a centralized platform where users can access, view, and analyze a wide range of data from various state agencies. It includes datasets on government spending, energy, environment, health, transportation, public safety, education, and more. The portal also offers tools to create charts, graphs, and maps, facilitating a deeper understanding of the data for research, policymaking, or personal use.

Stewards of Change Institute. (n.d.). National Interoperability Collaborative. Retrieved from https://nic-us.org/

The National Interoperability Collaborative (NIC), led by the Stewards of Change Institute, fosters cross-sector collaboration to enhance data interoperability and information sharing. NIC focuses on addressing societal challenges by bringing together stakeholders from health, human services, education, and other sectors to develop innovative solutions. The initiative provides tools, frameworks, and resources to support interoperability efforts, emphasizing secure and ethical data-sharing practices. By building a community of networks, NIC aims to create sustainable systems that improve outcomes and equity for communities across the United States.

The Data Literacy Project. (n.d.). Data Literacy Project. Retrieved from https://thedataliteracyproject.org/

The Data Literacy Project is a global initiative aimed at empowering individuals and organizations to make data-informed decisions by improving data literacy. The project offers resources, training, and tools to help users understand, interpret, and communicate data effectively. It collaborates with businesses, educators, and policymakers to create a world where everyone can confidently work with data. Through learning programs and advocacy, the Data Literacy Project seeks to close the global data skills gap and foster a data-literate society.

The Open Geospatial Consortium. (n.d.). *The Open Geospatial Consortium. OGC*. Retrieved from https://www.ogc.org/.

> The Open Geospatial Consortium (OGC) is an international organization that develops standards for geospatial and location-based data to ensure they are Findable, Accessible, Interoperable, and Reusable (FAIR). It brings together businesses, governments, and research organizations to advance the use of geospatial technology across various industries. OGC fosters collaboration through initiatives that solve global challenges, such as climate resilience, smart cities, and defense intelligence.

The White House. (n.d.). *Justice Data Initiative (JDI). Obama White House Archives*. Retrieved from https://obamawhitehouse.archives.gov/datadrivenjustice.

The Justice Data Initiative (JDI), launched under the Obama administration, focuses on reducing incarceration rates by using data-driven strategies. It aims to divert low-level offenders, especially those with mental health issues, from jails into appropriate services, and reform pre-trial detention practices by using risk assessments to prevent holding individuals simply because they can't afford bail. The initiative encourages collaboration across criminal justice and health systems to address the needs of high-contact individuals and reduce jail populations.

U.S. Department of Education. (n.d.). Statewide Longitudinal Data Systems (SLDS) Grant Program. National Center for Education Statistics. Retrieved from https://nces.ed.gov/programs/slds/

The *Statewide Longitudinal Data Systems (SLDS) Grant Program*, administered by the U.S. Department of Education's National Center for Education Statistics (NCES), provides funding to states to develop and enhance longitudinal data systems. These systems enable the collection, integration, and analysis of educational data over time, spanning early childhood, K-12, postsecondary education, and workforce outcomes.

The program aims to improve data-driven decision-making by providing educators, policymakers, and stakeholders with actionable insights to enhance educational outcomes. It emphasizes the use of secure, high-quality data to inform policy, evaluate program effectiveness, and improve student achievement. The SLDS Grant Program also promotes collaboration across agencies and encourages the adoption of best practices in data governance and system interoperability. By fostering comprehensive and accessible data systems, the program supports evidence-based strategies for addressing educational challenges.

U.S. Department of Health and Human Services. (n.d.). *HHS Protect. U.S. Department of Health and Human Services*. Retrieved from https://public-data-hub-dhhs.hub.arcgis.com/.

The HHS Protect Public Data Hub provides access to a range of public health data, including information related to COVID-19, healthcare facilities, and more. It uses geospatial technology to present data in a visually interactive format, allowing users to explore various health metrics and trends. The platform is designed to support transparency and provide key insights for public health responses and policy decisions.

U.S. Digital Service. (n.d.). *US Digital Service (USDS). U.S. Digital Servic*e. Retrieved from https://www.usds.gov/.

The U.S. Digital Service (USDS) is a team of technologists working to improve government services by creating human-centered digital solutions for critical needs. USDS partners with federal agencies to modernize tools, streamline processes, and make services like healthcare, veterans' benefits, and taxes more accessible and user-friendly. They focus on solving complex technology challenges to enhance public services for millions of Americans.

U.S. General Services Administration. (n.d.). *Digital Analytics Platform (DAP). Digital.gov*. Retrieved from https://digital.gov/guides/dap/.

The Digital Analytics Program (DAP), managed by the U.S. General Services Administration (GSA), provides web analytics tools to federal agencies to understand how users engage with their

websites and services. It utilizes Google Analytics 360 to track website traffic and user behavior, helping agencies improve their digital platforms. DAP is essential for enhancing public access to government services and is required for federal executive branch agencies.

U.S. General Services Administration. (n.d.). *Resources.data.gov (formerly Project Open Data). Resources.data.gov*. Retrieved from https://project-open-data.cio.gov/.

Resources.data.gov, formerly Project Open Data, serves as a repository of policies, tools, case studies, and guidance to support data management, governance, and open data initiatives across the U.S. federal government. The platform offers resources for data sharing, analysis, and transparency, enabling agencies to improve data accessibility and foster innovation. It also aligns with the Federal Data Strategy to help agencies comply with data policies.

U.S. General Services Administration. (n.d.). Technology Transformation Services (TTS). Retrieved from https://tts.gsa.gov/

The mission of GSA's Technology Transformation Services (TTS) is to modernize government services through innovative technology and data-driven solutions. TTS focuses on enhancing the public's experience with government by delivering modern technology tools, services, and solutions. The website highlights several core services, including IT modernization, digital service delivery, and data analytics, all designed to help federal agencies transition to secure, efficient, and user-focused systems. The site details key programs under TTS, such as 18F, a digital consultancy that partners with agencies to improve public-facing services, and the Centers of Excellence (CoE), which address complex challenges like cloud migration, artificial intelligence implementation, and infrastructure upgrades.

TTS emphasizes collaboration with federal agencies to implement emerging technologies, streamline operations, and enhance service delivery. The website also offers tools, training, and consulting to improve federal operations and public-facing services. It showcases successful projects, technical guides, and best practices to encourage innovation and effective technology adoption across government agencies.

Water Data Collaborative. (n.d.). Water Data Collaborative. Retrieved from https://www.waterdatacollaborative.org/

The Water Data Collaborative is a partnership focused on enhancing the use, collection, and sharing of water quality data to protect and manage water resources effectively. By bringing together NGOs, government agencies, and other stakeholders, the collaborative aims to standardize data collection practices and improve interoperability. It provides tools, training, and guidance to empower communities and organizations to leverage water data for informed decision-making and policy development. The initiative fosters collaboration and transparency, ensuring better stewardship of water resources.

XI. FURTHER READING

Tracking Federal Spending

In this paper, many benefits to intergovernmental data transparency, integration, and interoperability have been discussed. One of the most profound benefits, with the potential to transform governance, is the ability to track government spending at a granular level. By following the flow of funds from federal distribution to state and local implementation, stakeholders can ensure accountability and alignment with intended outcomes at every stage. This capability depends on robust data systems that prioritize transparency, integration, and interoperability. Transparency makes spending data accessible and understandable to stakeholders, fostering trust. Integration aligns data systems across jurisdictions, consolidating information for analysis. Interoperability standardizes reporting formats and protocols, enabling seamless tracking of funds from localities back up through states to the federal level. This closed-loop system strengthens oversight, enhances decision-making, and creates a feedback mechanism for continuous improvement in governance.

Here is a hypothetical example of what unlocking the benefits of interoperability could look like: Through funding by the Infrastructure Investment and Jobs Act (IIJA), a congested segment of state highway is going to be widened. The project aims to address severe traffic caused by a bottleneck at a merging point, which forces drivers to take alternate routes through nearby neighborhoods. This rerouting increases local traffic, compromises pedestrian safety, and worsens air and noise pollution. By expanding the highway, the project seeks to reduce travel times, improve traffic flow, and minimize negative impacts on surrounding communities while ensuring the efficient and transparent use of federal funds.

Real-time data collection is critical during the implementation phase, enabling stakeholders to monitor progress, spending, and immediate outcomes. Financial data from platforms like USAspending.gov integrates with state and local transportation systems, providing a clear picture of how IIJA funds are allocated and spent. This integration supports accurate budget management, ensures timely payments to contractors, and builds accountability at each stage. Construction progress is tracked through digital reporting tools, with sensors on equipment capturing productivity, material usage, and project milestones. Simultaneously, traffic data from roadside cameras and sensors offers insights into vehicle counts, congestion levels, and travel times within and around the construction zone. Data on traffic diversion into nearby neighborhoods helps identify potential problems, such as increased congestion or safety risks, and guides timely interventions.

Beyond project and traffic management, real-time environmental and safety monitoring ensures compliance with regulations and addresses community concerns. Air quality sensors measure changes in emissions from construction vehicles and idling traffic. Noise monitors assess the impact of construction activity on residential areas, while water quality sensors detect potential contamination from runoff. Worker safety is tracked through systems monitoring compliance with safety protocols, and local residents provide real-time feedback via mobile apps or hotlines to report issues such as noise, blocked access, or disruptions to businesses. These integrated data streams empower stakeholders to assess the project's immediate impacts and adjust strategies as needed.

After project completion, data integration continues to play a vital role in evaluating long-term outcomes. Traffic sensors monitor vehicle flow and travel times on the widened highway, providing evidence of reduced congestion. Neighborhood-level data, such as air quality improvements and decreases in traffic through residential streets, demonstrates the project's indirect benefits. Environmental monitoring confirms that pollutant levels, noise, and water quality have improved, while community feedback reveals whether local concerns have been adequately addressed. Economic data, such as changes in business revenue and property values, provides a broader picture of the project's regional impacts.

At each stage, the ability to trace data from local collection through state aggregation to federal oversight ensures alignment with project goals and enables transparent reporting. Local traffic, environmental, and safety data feed into state systems, where they are consolidated and standardized. These standardized reports are then submitted to federal agencies, ensuring that spending and outcomes are accurately documented at every level. Federal agencies, such as the Federal Highway Administration (FHWA), use this data to evaluate national progress toward infrastructure and sustainability goals while providing feedback to improve future projects.

This case demonstrates how the integration and interoperability of real-time data systems transform infrastructure projects, allowing stakeholders to track spending and outcomes in a closed-loop system. From initial federal funding to local implementation and back to federal oversight, this approach fosters transparency, optimizes resource allocation, and delivers measurable benefits for communities. As such, the widening of this highway segment not only fulfills its primary objectives but also establishes a model for future infrastructure investments that prioritize accountability, sustainability, and public trust.

Until government data becomes as interoperable as imagined in the above scenario, there are multiple non-government organizations with the mission to track federal spending that flows down to state and local levels, aiming to ensure accountability and transparency in the allocation and use of public funds. These organizations focus on how federal investments impact local communities, covering sectors like healthcare, infrastructure, education, and environmental initiatives. Below are some of many NGOs that track such multi-level government spending:

Good Jobs First: Subsidy Tracker and COVID Stimulus Watch

Good Jobs First tracks federal funds that pass to state and local governments, particularly in the form of subsidies and COVID-19 relief. Their COVID Stimulus Watch provides transparency on how federal pandemic-related relief, including CARES Act and American Rescue Plan (ARP) funding, is used by state and local governments. Their Subsidy Tracker is

an extensive database of economic development subsidies, tax breaks, and grants given to corporations, broken down to local levels.

- Subsidy Tracker: https://www.goodjobsfirst.org/subsidy-tracker
- COVID Stimulus Watch: https://covidstimuluswatch.org/

National Priorities Project (NPP)

NPP is dedicated to making complex federal budget data accessible to the public, with a focus on how federal funds are allocated across the U.S. to state and local governments. NPP's

Federal Budget Dashboard provides insight into federal allocations to states, including spending on education, healthcare, infrastructure, and emergency relief. It also shows the impacts of these funds on local communities.

- National Priorities Project: https://www.nationalpriorities.org/

Accountable.US

Accountable.US tracks the flow of federal funds from Washington to state and local governments, particularly with a focus on pandemic recovery programs, infrastructure spending, and environmental protection funds. They monitor the use of funds through their various projects, such as COVID Bailout Tracker and American Rescue Plan monitoring.

- Accountable.US: https://www.accountable.us/

ProPublica: Nonprofit Explorer and Federal Spending Projects

ProPublica, a nonprofit investigative journalism organization, provides tools for tracking government spending. Their Nonprofit Explorer tool tracks grants and funds distributed to nonprofit organizations across states and cities. They also cover major public spending initiatives and the federal-state-local relationships in projects like disaster recovery and infrastructure development.

- ProPublica Nonprofit Explorer: https://projects.propublica.org/nonprofits/

Center for Budget and Policy Priorities (CBPP)

CBPP is a nonpartisan research and policy institute that monitors federal investments and their impact on state and local budgets, especially around public services such as healthcare, education, and infrastructure. CBPP tracks how federal dollars from programs like Medicaid and SNAP (food stamps) are administered by state and local governments.

- CBPP: https://www.cbpp.org/

Brookings Institution: ARPA Investment Tracker

The ARPA Investment Tracker, developed by the Brookings Institution in partnership with the National Association of Counties (NACo), focuses on tracking how funds from the American Rescue Plan Act (ARPA) are allocated and spent by large cities and counties. The tracker shows specific projects funded by ARPA at both state and local levels.

- ARPA Investment Tracker: https://www.brookings.edu/interactives/arpa-investment-tracker/

Center for Public Integrity

This nonprofit investigative group tracks federal funds flowing down to state and local levels, especially related to infrastructure projects, disaster recovery, and economic development. They regularly publish reports on how federal programs impact communities across the U.S.

- Center for Public Integrity: https://publicintegrity.org/

Open the Books

Open the Books is a government transparency organization that tracks government spending at all levels, from federal to state to local. They provide tools for the public to see how tax dollars are spent on everything from infrastructure projects to public employee salaries.

- Open the Books: https://www.openthebooks.com/

Environmental Working Group (EWG)

EWG provides transparency around government subsidies and spending in the agriculture sector, including federal farm subsidies that flow down to state and local levels. Their Farm Subsidy Database tracks billions in federal agricultural support and breaks it down by state, county, and individual recipient.

- EWG Farm Subsidy Database: https://farm.ewg.org/

EducationData.org

This platform tracks federal and state spending on education, including funding from the U.S. Department of Education that flows to states, districts, and local educational programs. The site provides insight into federal programs such as Title I funding, Pell Grants, and how these funds impact local schools.

- EducationData.org: https://educationdata.org/

Federal Funds Information for States (FFIS)

FFIS is a nonprofit organization that provides states with detailed reports on the allocation of federal funds. They track and analyze federal spending programs such as Medicaid, education funding, infrastructure, and disaster relief, focusing on how these funds impact state and local budgets.

- FFIS: https://www.ffis.org/

The Public Interest Network

This network of organizations, including U.S. PIRG, focuses on transparency and accountability in public spending. U.S. PIRG in particular tracks how federal dollars are spent in areas like infrastructure, public health, and education, often breaking it down by state and local impacts.

- U.S. PIRG: https://uspirg.org/

Institute for Local Self-Reliance (ILSR)

ILSR focuses on local economic development and tracks federal spending on infrastructure, particularly broadband and clean energy, that impacts local communities. They advocate for stronger local control over federal dollars, with detailed analysis on how federal funds are used at the local level.

- ILSR: https://ilsr.org/

JustFacts.com

JustFacts offers a data-rich repository of government spending at federal, state, and local levels. They track the distribution of federal funds for key sectors like education, defense, and

public infrastructure, often providing a breakdown of how these funds are allocated across state and local governments.

- JustFacts: https://www.justfacts.com/

FreedomWorks

FreedomWorks, a nonprofit focused on smaller government, tracks federal spending programs, especially those that funnel money down to the states. They advocate for limiting federal government spending and promote greater accountability in how states manage federal funds, particularly in areas such as public healthcare, infrastructure, and welfare programs.

- FreedomWorks: https://www.freedomworks.org/

PROJECT RECOMMENDATIONS for USAFacts

As a nonpartisan organization dedicated to providing Americans with clear, accessible government data, USAFacts stands at the intersection of information transparency and civic engagement. This section outlines recommendations designed to increase the organization's impact, while keeping aligned with its mission. Some of the proposed projects recognize the value of existing initiatives and seek to build upon them. Others are new initiatives that would require advocacy and/or implementation. By focusing on opportunities to advocate, educate, and demonstrate, these recommendations aim to address critical challenges to data interoperability, while positioning USAFacts as the leading and most trusted source for providing unbiased data to both citizens and policymakers.

I. ADVOCATE

A. ESTABLISH A POLICY WORKING GROUP

Purpose: To create model policies for secure and effective data sharing across federal, state, and local levels of government. Where possible, these policies will look to ensure interoperability both vertically (federal-to-state/local) and horizontally (state-to-state or local-to-local), while safeguarding individual privacy rights and compliance with privacy regulations.

Outcome: The initiative will produce model policies for states and localities that align with federal standards. The intent of these policies is to make it possible for governments to securely share data across agencies and jurisdictions, improving collaboration and decision-making. Where possible, the policies will enhance data standardization, privacy management, and security, reducing barriers to interoperability while protecting individual privacy.

Approach: Establish a Working Group to Revise and Align Federal, State, and Local Privacy Policies.

- Assemble representatives from USAFacts, The Beeck Center, GovEx, and other relevant philanthropic, AI, and data governance experts.
- Engage policymakers and technical experts to ensure actionable outcomes.
- Conduct a comprehensive review of existing federal privacy policies (e.g., HIPAA, FERPA, COPPA) to identify gaps or barriers to data sharing.

- Develop updated policies that provide clear and actionable guidance for intergovernmental data sharing, balancing security, privacy, and compliance.
- Ensure these policies enable seamless data-sharing practices while respecting regional needs and legal frameworks.
- Ensure that these policies account for Privacy Enhancement Technologies (PETs) and that advocacy groups like the Future of Privacy Forum (www.fpf.org) are engaged.
- Pilot revised policies and model frameworks with selected state and local governments.

- Monitor the effectiveness of the policies, gather feedback, and make iterative improvements as needed.

B. ADVOCATE FOR THE ESTABLISHMENT OF A SUB OFFICE OF THE CONGRESSIONAL RESEARCH SERVICE (CRS) AND THE CREATION OF A CONGRESSIONAL DATA LLM ENGINE

Purpose: To improve how Congress interacts with federal data resources by providing staff with better tools and training.

Outcome: A Congress able to make more informed decisions based on unbiased, accurate, and accessible data through stronger connections between legislators and data systems, encouraged collaboration, and a supported shift toward data-driven policymaking.

Approach: Advocate for the Establishment of a Sub Office of the Congressional Research Service and the creation of a Congressional data LLM engine.

The Legislative Branch Offices were created for the sole use of Congress to assist them in accessing non-biased information. However, the scope of these offices can often be too narrow for Congressional needs:

CBO's Role: Focuses on cost estimates, economic forecasts, and budgetary issues but doesn't delve deeply into granular data for all policy areas.

CRS's Role: Produces reports and research based on existing data but does not collect raw data or create new datasets.

GAO's Role: Primarily audits federal programs and assesses their efficiency but is not a data repository for real-time or comprehensive statistics.

- Advocate for the establishment of a sub office of the CRS that is responsible for the creation, population, and management of a Large Language Model (LLM) engine.

- Advocate for the creation of a Large Language Model (LLM) engine.
  - ➲ Create an LLM designed to serve the unique needs of Congressional members, its staff, and the CRS. Powered by an extensive and complete dataset, carefully organized and verified for accuracy and drawn from federal agencies, the engine acts as an intuitive, AI-driven resource for addressing critical legislative and policy questions.
    - **Core Functions of the LLM Engine:**

- Unified Data Access: Aggregates and harmonizes data from federal agencies for seamless searching and analysis.
- Natural Language Querying: Responds to plain-language questions with clear, actionable answers.
- Spending and Policy Analysis: Tracks federal spending, evaluates program effectiveness, and compares policy impacts across time or regions.

- Report and Visualization Tools: Generates tailored reports, summaries, and visualizations to support hearings, briefings, and public communications.
- Advanced Research Support for CRS: Expands Congressional Research Service capabilities with tools for data synthesis, impact modeling, and historical analysis.
- Scenario Analysis and Forecasting: Simulates the effects of legislative actions and conducts cost-benefit evaluations of proposals.

▪ The engine aspires to be the go-to analytical tool for Congress, revolutionizing the way Congress and CRS access, analyze, and apply information. The inclusion of CRS ensures that legislators have access to the highest-quality research and analysis, reinforcing the critical role of evidence-based governance.

➲ Utilize commercial platforms that can present more real time sentiment on the impact of government spend. An example of one of these tools is Occam, by AlphaROC - a machine learning-powered analytics platform that provides real-time insights by integrating data from sources like transactions and web engagement. Its features include detecting trends, demographic insights, and predictive modeling, making it ideal for analyzing outcomes and driving informed decisions. [https://www.alpharoc.ai/occam]

II. EDUCATE

A. ENCOURAGE DATA USE WHILE FOSTERING DATA LITERACY AND EMPHASIZING ITS IMPORTANCE

Purpose: To build engagement with data, trust with citizenry, and brand as an advocate and source for unbiased and accessible government data.

Outcome: An increase in newsletter subscriptions and visits to the website, a more knowledgeable citizenry regarding data and data analysis, and the curation of citizen cheerleaders for government data accessibility and interoperability.

Approach: A series of engagement activities for the website, social media, and schools.

- **Creation of "Word of the Week" social media posts**
  - ➲ Create weekly videos or posts for social media accounts that focus on one term.
  - ➲ Example: Interoperability. Provide the definition in a very simple way and why it matters.

- **Extend the "Just the Facts" video series**
  - ➲ Extend the format of the "Just the Facts" video series by inviting questions from the public or narrowing the focus to receiving questions from high school or college students. Questions would be categorized by topic, and Steve Ballmer could produce a video series discussing these topics and answering the questions. This could start as a quarterly initiative and, if successful, be offered more frequently.

- **Create an Online Data Literacy Quiz and Training**
  - Are You Data Literate?: In the vein of the Data Skills for Congress course, a very short and simple flashcard/multiple choice quiz to be promoted on social media and housed on the website. Completion of the quiz leads to other learning opportunities. Can also consider making it competitive and tracking participant scores over time.
  - Develop 4-6 fun, simple, informative short modules on data literacy for general public consumption.
  - Development of online, on demand courses for the general public. Courses could be adjusted to serve non-profits and local governments, as well.

- **Donate Printed Materials to Schools**
  - Make known on the website that bulk copies of reports are available for educational purposes, either via donation or very low-cost purchase.

B. CONTINUE AND EXPAND CONGRESSIONAL EDUCATION EFFORTS

Purpose: To improve how Congress interacts with federal data resources by providing staff with better tools and training.

Outcome: A Congress able to make more informed decisions based on unbiased, accurate, and accessible data through stronger connections between legislators and data systems, encouraged collaboration, and a supported shift toward data-driven policymaking.

Approach: Expand educational offerings and increase frequency of conversations

- **Creation of "Finding Data" Course**
  - In addition to the Data Skills for Congress course, a supplemental module to this could be "Finding Data." This module would reiterate data resources provided during the onboarding process and an overview of how to use them in relation to what they have learned in the Data Skills course.

- **Engage with Congressional Staffers on a More Regular Basis**
  - Establish a regularly scheduled online convening of staffers to gain feedback on courses and in-person meetings, as well as discussion of new hot topics that USAFacts can include in articles and fact books.
  - Use these meeting as an opportunity to enroll staffers to advocate for data interoperability and more data resources.

III. DEMONSTRATE

A. PROOF OF CONCEPT PROJECT FOR VERTICAL DATA INTEROPERABILITY

Purpose: Develop a proof of concept demonstrating how federal, state, and local collaboration, supported by modern data systems, can enhance program oversight and outcomes.

Outcome: Create a replicable model showcasing the value of integrated data for optimizing program impact and efficiency. This includes improved transparency in resource allocation and service delivery, streamlined data collection and reporting processes, and better decision-making through real-time, data-driven insights.

Approach: Track Spending Data from the Federal to the Local Level and Understand Outcomes

- The project's scope focuses on integrating data from one selected mandatory program and one selected discretionary program (ex: Head Start and Broadband) across 2-4 pilot states to test federal, state, and local data interoperability.
- The selected states will represent diverse demographic, geographic, and economic profiles to ensure comprehensive representation. This collaboration will involve local agencies and stakeholders to facilitate data sharing and promote program success.
- The project will be executed in five phases.
  - ➲ Planning and Engagement: Engage key stakeholders to define key performance indicators (KPIs) and establish data requirements.
  - ➲ Data Collection and Integration: Develop a standardized data collection template, create automated data pipelines, and establish data validation protocols.
  - ➲ Real-Time Data Visualization and Analysis: Create real-time dashboards that will provide stakeholders with comprehensive visibility into program metrics and data analyses.
  - ➲ Program Evaluation and Continuous Improvement: Dashboard will provide comparative analyses that will highlight implementation differences and identify areas for improvement.
  - ➲ Scaling and Policy Recommendations: Development of a framework for scaling the model to additional states and policy recommendations for broader adoption and sustainability of the data integration approach.

B. NGO PARTNERSHIP TO DEMONSTRATE THE POWER OF REGIONAL COLLABORATIONS

Purpose: To foster partnerships between smaller municipalities and nearby cities to address the financial and technical challenges smaller communities face when trying to enable data interoperability.

Outcome: Create a sustainable model of regional collaboration that maximizes resources, bridges technological gaps, and ultimately strengthens public governance and service delivery.

Approach: Partner with GovEx and its City Data Alliance and GovEx Academy Initiatives to expand current work with cities to collaborations with smaller municipalities.

- Create a regional collaboration model by integrating smaller municipalities adjacent to larger cities currently engaged with GovEx. The collaboration will allow smaller towns, which often face financial and technical constraints, to benefit from the advanced data tools, educational resources, and technical support available to larger cities, while the

- cities gain insights from a broader regional perspective and a more cohesive data ecosystem.
  - Conduct a Needs Assessment and Select Towns: Collaborate with local government associations and community groups to identify three towns with limited financial and technical resources. These towns will be assessed for their readiness and specific needs in terms of technology, data management, and governance.
  - Establish Partnership Framework: Develop a comprehensive framework that formalizes the participation of these towns in the larger city's data initiatives. This framework will include roles, expectations, and a collaborative governance model that details how cities and towns will work together.
  - Create Customized Support Programs via Two Distance Support Tracks:
    - Track 1: Integration with Larger City Initiatives – Technologically mature towns will join existing projects in cities like Boston, benefiting directly from resources and programs being implemented.
    - Track 2: Foundational Capacity Building – Towns with less developed data infrastructure will receive dedicated assistance in technology deployment, staff training, and resource allocation to establish a baseline data capacity that will enable them to participate in future initiatives.
  - Seek Funding: Seek additional funding through philanthropic grants, state-level funding programs, or private partnerships to provide financial support for technology acquisition, staff capacity building, and initial implementation costs.
  - Monitor and Evaluate Progress: Implement a robust evaluation framework to track the progress of participating towns, assess improvements in data capacity and governance, and refine the program based on feedback and performance data. This will include regular progress reports, stakeholder interviews, and case studies documenting successful outcomes and challenges.

BALLMER GROUP ENGAGEMENT

As a philanthropic leader committed to improving economic mobility and addressing systemic inequities, the Ballmer Group plays a pivotal role in driving transformative change across critical social sectors. This recommendation focuses on how the Ballmer Group can amplify its impact by partnering with CiviCity to expand the application of civic data trusts. This partnership presents an opportunity to leverage innovative, scalable solutions while fostering collaboration and transparency among stakeholders.

Overview of CiviCity

CiviCity is a new, groundbreaking social enterprise founded by Warren Flood, dedicated to leveraging data-driven solutions to address systemic inequities and create sustainable, equitable outcomes for underserved communities. Building on the success of the nationally recognized Connect 313 Initiative in Detroit, CiviCity empowers cities and organizations across the United States to use civic data trusts as transformative tools for improving quality of life and fostering economic mobility.

At the heart of CiviCity's approach is the civic data trust model, a centralized system designed to aggregate, clean, and standardize data from diverse sources such as governments, nonprofits, academic institutions, and private companies. By turning complex datasets into accessible formats—like Excel spreadsheets—CiviCity democratizes data, making it easy for community leaders, policymakers, and other stakeholders to analyze and act on insights. This emphasis on accessibility ensures that individuals at all levels of technical expertise can engage with and utilize data effectively to guide decisions.

CiviCity enhances decision-making, streamlines collaboration across sectors, and guides targeted interventions to address local challenges. It prioritizes collaboration by bringing together public and private stakeholders to create unified strategies, while ensuring sustainability by building systems that communities can maintain and scale long-term. The organization also emphasizes transparency and measurable outcomes, providing tools to track the effectiveness of interventions and continuously refine solutions.

CiviCity's mission is to help communities unlock the power of data to drive equitable access to services and optimize resource allocation. The organization envisions a future where data is not merely a resource but a catalyst for change, enabling cities to address their most pressing challenges effectively. By empowering communities with accessible, actionable data, CiviCity is setting a new standard for how information can foster equity, inclusion, and opportunity nationwide.

Success in Detroit: Connect 313

Overview

The Connect 313 Initiative, spearheaded in Detroit, Michigan, is a prime example of how a data-driven approach can address systemic inequities and close the digital divide. Launched during the COVID-19 pandemic, the initiative sought to provide reliable internet access, digital literacy training, and technological resources to underserved communities, particularly those

most affected by the city's historical economic challenges. By leveraging a civic data trust model, Connect 313 achieved measurable success in improving digital access and literacy, and became a model for addressing similar issues nationwide.

Core Problem: Digital Inequity

In Detroit, many underserved communities, especially black and low-income residents, lacked reliable internet, devices, and digital skills. This inequality became glaring during the COVID-19 pandemic, as digital access became vital for education, healthcare, and employment. At that time, over one-third of Detroit households lacked broadband internet, making it the least connected large city in the United States.

Solution: The Connect 313 Initiative

Established in 2020, the Connect 313 Initiative was designed to address Detroit's significant digital divide by implementing a comprehensive data trust model paired with strong collaboration across public and private sectors.

The initiative focused on three primary goals:

1. **Increase Digital Access**: By providing devices, internet connectivity, and expanding public Wi-Fi in underserved areas.
2. **Improve Digital Literacy**: Through community programs offering training and support for residents to build essential digital skills.
3. **Optimize Resource Allocation**: Using the civic data trust to identify and direct resources to areas with the greatest need.

The local civic data trust served as the backbone of the initiative, aggregating, cleaning, and analyzing data from diverse sources such as government databases, nonprofits, and private companies. This trust allowed stakeholders to collaborate in real-time, monitor the outcomes of interventions, and target efforts like setting up neighborhood tech hubs or deploying public Wi-Fi. Partnerships with technology providers like Microsoft, nonprofits such as human-I-T, and academic institutions like the University of Michigan amplified the initiative's reach and effectiveness.

Additionally, Connect 313's interventions were highly scalable. The initiative established neighborhood tech hubs to provide internet access and training, installed public Wi-Fi in parks, and distributed devices to over 51,000 public school students to support online learning.

Tangible Results

The Connect 313 Initiative produced measurable and transformative outcomes for Detroit, significantly improving digital equity and setting a national standard for addressing the digital divide. Key results include:

- **Improved Connectivity:** The initiative closed Detroit's household broadband gap by 25%, elevating the city from being one of America's least connected to a national leader in digital equity.
- **Devices Distributed:** Over 51,000 connected devices were provided to students in public schools, enabling access to remote learning and educational resources during the COVID-19 pandemic.

- **Public Wi-Fi Expansion:** Public Wi-Fi initiatives extended connectivity to numerous parks and community spaces, offering free internet access to underserved neighborhoods.
- **Neighborhood Tech Hubs:** Multiple tech hubs were established in key areas, providing reliable internet, digital literacy training, and technical support to thousands of residents.
- **Funding Amplification:** An initial investment of $2 million attracted over $75 million in additional funding for digital inclusion efforts, demonstrating the program's effectiveness and scalability.
- **National Leadership:** Detroit emerged as a leader in enrolling households in federally subsidized broadband programs such as the Emergency Broadband Benefit (EBB), becoming a national model for community-driven broadband adoption.
- **Broadband Enrollment Growth:** Participation in federal broadband programs surged, with Detroit leading many cities in connecting underserved households to affordable internet services.
- **Ecosystem Optimization:** By reducing the time spent on manual data wrangling, analysts could focus on generating actionable insights, improving the efficiency and impact of resource allocation.

What Makes It Unique

Connect 313's success lies in its innovative and replicable approach to solving complex systemic issues:

1. **Data Trust as a Foundation**: The civic data trust acted as a centralized platform for data aggregation, cleaning, and analysis, enabling data-driven decisions that targeted the areas with the most significant needs.
2. **Accessible Data**: The initiative democratized data by using familiar formats like Excel spreadsheets, ensuring that stakeholders of varying technical expertise could engage with and act on insights.
3. **Collaborative Partnerships**: Connect 313 brought together government agencies, technology providers, nonprofits, and universities to pool resources, expertise, and funding for a collective impact.
4. **Scalable and Sustainable Design**: The modular and iterative structure allowed the initiative to adapt to local contexts while remaining replicable in other regions facing similar challenges.
5. **Focus on Measurable Impact**: With tools for real-time monitoring and targeted resource allocation, the initiative ensured that every effort was trackable and results-oriented, building trust among stakeholders and funders.

Ballmer Group + CiviCity

The Ballmer Group's mission to improve economic mobility and address systemic inequities aligns perfectly with the vision and capabilities of CiviCity. By becoming a primary funder and strategic partner of CiviCity, the Ballmer Group has a unique opportunity to extend its transformative impact not only in its key focus areas of Detroit, Los Angeles, and Seattle/King County but also across the nation. CiviCity's innovative civic data trust framework offers scalable, data-driven solutions that can be applied to diverse challenges—from housing and healthcare to

education and public safety. CiviCity's ability to aggregate, analyze, and democratize data ensures that interventions are precise, impactful, and equitable.

Recommended Actions

1. **Schedule an Introductory Meeting**: USAFacts can facilitate an initial meeting between the Ballmer Group leadership and Warren Flood, founder of CiviCity, to explore potential synergies. This meeting would provide an opportunity for Warren to present the civic data trust model in detail, share insights from the Connect 313 Initiative, and outline how CiviCity's framework aligns with the Ballmer Group's mission and goals.
2. **Assess Alignment with Ballmer Group Impact Areas:** Collaboratively identify specific areas within the Ballmer Group's purview—such as early childhood development, housing, education, behavioral health, or criminal justice reform—where CiviCity's data-driven solutions can be most impactful. This alignment would guide the strategic prioritization of pilot projects or initiatives.
3. **Conduct a Demonstration or Pilot Session:** Arrange for Warren and his team to demonstrate the functionality of a civic data trust. This could include showcasing how CiviCity's solutions optimize resource allocation, track outcomes, and enable collaborative decision-making across sectors.
4. **Develop a Framework for Pilot Projects:** Work with Warren to design pilot projects in key geographic areas such as Detroit, Los Angeles, or Seattle/King County. These pilots could target pressing challenges like housing instability, healthcare disparities, or digital equity, demonstrating the adaptability and impact of the civic data trust model.
5. **Facilitate Workshops and Knowledge Sharing:** Organize workshops or webinars led by CiviCity to introduce the civic data trust model to community stakeholders, policymakers, and nonprofit leaders. These sessions would not only build buy-in but also position the Ballmer Group as a leader in driving systemic change through innovation.
6. **Promote Advocacy and Funding Opportunities:** Collaborate with Warren to advocate for civic data trusts as a powerful tool for systemic change. Support efforts to secure additional funding from philanthropic, government, and private sector sources to expand the reach and impact of the model.

A Transformational Partnership

By investing in CiviCity, the Ballmer Group can amplify its impact, enabling data-driven solutions that are both scalable and sustainable. This partnership represents a unique synergy, blending the Ballmer Group's philanthropic leadership with CiviCity's proven, innovative framework to tackle systemic inequities. Together, they can create lasting change in communities nationwide, setting the standard for how data can drive progress.

Warren Flood – LinkedIn Profile