

IBM Center for The Business of Government

# Agile Problem Solving in Government:

A Case Study of The Opportunity Project



**Joel Gurin and Katarina Rebello**  
The Center for Open Data Enterprise

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# FOREWORD

**On behalf of the IBM Center for The Business of Government, we are pleased to present this report, *Agile Problem Solving in Government: A Case Study of The Opportunity Project*, by Joel Gurin and Katarina Rebello, Center for Open Data Enterprise.**

Across government, agencies face constant and often expanding levels of complexity in delivering on their mission objectives. Citizen expectations, changing technologies, a mass proliferation of data, and new business processes are among the key external forces that challenge agencies to serve constituents in new ways.

At the same time, growing demands for fast response to problem solving reduce the time that agencies have for developing strategies that enable them to achieve mission objectives. In recent years, agile development has advanced in both industry and government as a method of designing software that builds functionality in rapid increments that involve both developers and users. Agile methodology is increasingly being used in non-IT efforts as well.

The Opportunity Project (TOP), a program run out of the Bureau of the Census at the U.S. Department of Commerce, has for several years served as a catalyst in adapting agile techniques to solve complex agency mission problems, through a process that brings together agencies, industry, and citizens. The Project’s website refers to its goal as “a process for engaging government, communities, and the technology industry to create digital tools that address our greatest challenges as a nation. This process helps to empower people with technology, make government data more accessible and user-friendly, and facilitate cross-sector collaboration to build new digital solutions with open data.”

TOP works with Federal government agencies to identify significant challenges, and then facilitates partnerships among agency leaders, industry and non-profit innovators, and citizen users to collaborate as teams in developing innovative approaches to address those challenges. The teams leverage agile techniques to build prototype technology and process solutions over a 12-14 week time frame, and then show their work to the public so that agency stakeholders from all sectors can learn from and adapt the solutions. TOP represents a unique, cross-agency program that provides a model for how agencies can work with private sector partners to develop practical approaches to complex problems in an agile, iterative fashion.



DANIEL J. CHENOK



MARK BOLTER

In this report, Joel Gurin and Katarina Rebello outline the key elements and critical success factors involved in The Opportunity Project. Drawing insights from several TOP case studies, the authors provide lessons for other agencies, and indeed for governments at all levels, on how agile problem solving can enable public-private collaboration that helps address some of their most significant mission-focused issues.

This report continues the Center's longstanding focus on how agile techniques can help improve government. Prior studies on this topic include *A Guide to Critical Success Factors in Agile Delivery* by Philippe Krutchen and Paul Gorans, which was an early assessment of the promise of agile for the public sector; and *Digital Service Teams: Challenges and Recommendations for Government* by Ines Mergel, which provided insights into digital services activities that leveraged agile techniques for governments in the U.S. and around the world.

We hope that this report, along with past and future Center work on helping government become a more agile and effective enterprise, will help agencies learn lessons on how to achieve their mission and serve their constituents quickly and cost-effectively in an era of ever-expanding complexity.



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# EXECUTIVE SUMMARY

**The Opportunity Project (TOP)—a program hosted by the U.S. Department of Commerce to address some of the nation’s greatest challenges—is transforming the culture of open data in the federal government.**

TOP has developed innovative ways to adapt agile principles and methods to help government agencies, communities, and the technology industry build digital tools and platforms using open government data. TOP convenes teams and leads them through technology development sprints to produce applications that address challenges in healthcare, education, transportation, and many other pressing public areas of need. The process helps to empower people with technology, make government data more accessible and user-friendly, and facilitate cross-sector collaboration.<sup>1</sup> This innovative approach has produced over 70 digital tools since TOP was launched in 2016, and is now being replicated by others in government.

The Opportunity Project, and the methodology it has developed, have demonstrated a range of benefits for all stakeholders. Government agencies benefit both from the work of tech teams and from the experience of participating in user-focused projects. Companies that contribute their work through tech teams have an opportunity to showcase their capabilities while learning about government data resources. And user advocates participating in TOP help ensure that their needs have priority in government data programs and resulting technologies. By adopting and adapting TOP’s approach to their own missions and programs, government agencies and stakeholders can apply agile, collaborative solutions to a wide range of public challenges.

This report summarizes the work of the Opportunity Project in 2018, explores examples that show the impact and challenges of this process, and presents lessons learned and recommendations for similar work across agencies in the future. The report concludes by assessing the value of The Opportunity Project as a model for applying agile methods to solve complex mission problems for agencies.

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1. The Opportunity Project, “What is The Opportunity Project?” Retrieved from <https://opportunity.census.gov/>

# INTRODUCTION

**On March 1, 2019, over 200 people joined The Opportunity Project (TOP) team at the U.S. Census Bureau headquarters in Maryland for a showcase of over 20 digital tools and platforms developed using open government data in 2018.<sup>2</sup>**

Traveling from as far away as Puerto Rico and Estonia, participants came to see a unique demonstration of how open government data can help solve public challenges, including:

- An interactive game built using federal disaster and protection data to educate young adults about local disaster risks when they move to a new area
- A risk-assessment tool using satellite data to find areas where poor infrastructure may be most vulnerable during natural disasters
- A model using geospatial and emergency medical services (EMS) data to predict where and when the risk of opioid overdose will be high
- Online tools that use artificial intelligence (AI) and occupational data to match veterans with job apprenticeships
- A website that uses federal spending and audit data to identify and maximize available funds for addressing homelessness

In just three years, TOP has enabled the development of over 70 digital tools, including those launched at this “Demo Day” in March 2019. The Opportunity Project represents a highly successful programmatic example of how open government data can rapidly be turned into applications with great public benefit. TOP does this by combining three key elements: the power of open government data, public-private collaboration, and high-energy agile approaches to software development.

TOP leverages 12-14 week technology development cycles, consisting of 2 week sprints, to create innovative solutions through the close collaboration of government agencies, communities, and the technology industry. This process helps to empower people with technology, make government data more accessible and user-friendly, and facilitate cross-sector collaboration to build new digital solutions. TOP sprints follow a cohort model, where many teams work on separate projects in parallel along the same timeline.



## A note on terminology

This report uses the terms “development cycle” and “sprint” in accordance with common agile terminology. TOP uses a different nomenclature, referring to each full development cycle as a “sprint” and each 2 week sprint as a “milestone.”

2. U.S. Census Bureau, “The Opportunity Project Press Kit,” Retrieved from <https://www.census.gov/newsroom/press-kits/2019/opportunity-project.html>

The Opportunity Project was conceptualized and launched during the Obama administration. The idea was largely inspired by the development of the U.S. Department of Education's College Scorecard, which brought together stakeholders from federal agencies, industry, and civil society to develop an easy-to-use tool built with government data. The founders of TOP set out to broaden this initiative by developing a replicable methodology to leverage government data that is open and accessible to the public.<sup>3</sup>

In late 2015, a team from the Domestic Policy Council, the Office of Management and Budget (OMB), and the Office of Science and Technology Policy (OSTP) formed the idea for TOP, and together with representatives from the U.S. Department of Housing and Urban Development, Presidential Innovation Fellows (PIFs) at the U.S. Census Bureau, and the initial 12 tech teams, kicked off the first TOP development cycle.

This first cycle was organized around an overarching theme of economic mobility, including applications of federal open data to help families find affordable housing, and to help policymakers identify inequities in their communities and how best to address them. User personas were developed to help teams focus on the kinds of people who could benefit from their work, such as LGBT youth experiencing homelessness, and a survivor of domestic violence relocating to a new area. Effective personas, which describe the needs and expectations of different user groups, can help inform design decisions by “adding a layer of real-world consideration to the conversation.”<sup>4</sup> The first TOP development cycle, which took place over a period of roughly two months, produced a dozen new tools developed for the cities of Baltimore, Detroit, Kansas City, New Orleans, New York, Philadelphia, San Francisco, and Washington, D.C., by organizations and companies including Zillow, GreatSchools, PolicyLink, and Streetwyze.<sup>5</sup>

Later in 2016, the same TOP leadership team from 2015 engaged federal leaders in developing the first set of agency-led problem statements. This model enabled TOP to bring in other federal agencies focused on providing a wide range of citizen services—including education, workforce development, health and healthcare services—while also connecting with end users on the ground. Resulting products included Redfin's Opportunity Score, Ovela's FindYour.Town, and Azavea's Transit Analyst, which were developed using open government data from agencies including the U.S. Department of Agriculture, the U.S. Department of Commerce, and the U.S. Department of Transportation.

The Opportunity Project continues to find broad support in the Trump administration, which has maintained the commitment to increasing the use of federal open data. In March 2018, the President's Management Agenda<sup>6</sup> highlighted The Opportunity Project as a model to guide the development of the Federal Data Strategy.<sup>7</sup> The TOP leadership team has continued to grow and is currently housed inside

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3. U.S. Department of Education, “The College Scorecard,” Retrieved from <https://collegescorecard.ed.gov/>

4. Usability.gov, “Personas,” Retrieved from <https://www.usability.gov/how-to-and-tools/methods/personas.html>

5. The White House, Office of the Press Secretary, [Archive] “Fact Sheet: The White House Launches ‘The Opportunity Project,’ Utilizing Open Data to Build Stronger Ladders of Opportunity for All,” March 7, 2016, Retrieved from <https://obamawhitehouse.archives.gov/the-press-office/2016/03/07/fact-sheet-white-house-launches-opportunity-project-utilizing-open-data>

6. The White House, Office of Management and Budget, “The President's Management Agenda,” Retrieved from <https://www.whitehouse.gov/omb/management/pma/>

7. U.S. General Services Administration, Technology Transformation Service, “Federal Data Strategy,” Retrieved from <https://strategy.data.gov/>

of “America’s data agency,”<sup>8</sup> the U.S. Department of Commerce. TOP has developed a unique role distinct from other federal innovation projects and teams, such as the General Service Administration’s 18F,<sup>9</sup> the U.S. Digital Service,<sup>10</sup> and the Joint Venture<sup>11</sup> authority within the National Technical Information Service.

The Opportunity Project’s website, <https://opportunity.census.gov>, includes many examples of digital tools that have emerged as well as a detailed overview of its previous sprints. This website, which also includes a detailed toolkit,<sup>12</sup> was launched to “help ensure that an increasing number of users continue to collaborate with each other and take advantage of The Opportunity Project.”<sup>13</sup>

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8. U.S. Department of Commerce, Office of Public Affairs, “U.S. Secretary of Commerce Wilbur Ross Delivers Keynote on Federal Data at NTIS-Hosted Forum,” April 4, 2017, Retrieved from <https://www.commerce.gov/news/speeches/2017/04/us-secretary-commerce-wilbur-ross-delivers-keynote-federal-data-ntis>

9. U.S. General Services Administration, “18F: Digital service delivery,” Retrieved from <https://18f.gsa.gov/>

10. U.S. Digital Service, “The United States Digital Service,” Retrieved from <https://www.usds.gov/>

11. U.S. Department of Commerce, National Technical Information Service (NTIS), “NTIS Joint Venture Partners,” Retrieved from <https://www.ntis.gov/jvplist.html>

12. The Opportunity Project, “The Opportunity Project Toolkit,” Retrieved from <https://opportunity.census.gov/toolkit.html>

13. The White House, Office of the Press Secretary, [Archive] “Fact Sheet: The White House Launches ‘The Opportunity Project,’ Utilizing Open Data to Build Stronger Ladders of Opportunity for All,” March 7, 2016, Retrieved from <https://obamawhitehouse.archives.gov/the-press-office/2016/03/07/fact-sheet-white-house-launches-opportunity-project-utilizing-open-data>

# The Opportunity Project's Agile Methodology



## What is Agile?

A 2014 report published by the IBM Center for the Business of Government describes agile development as “a set of values and principles based on best practices for delivery of software and other IT projects.”<sup>14</sup> In the U.S. federal context, agile development can support the capacity of agencies to enable innovation and the application of government data with limited resources. This approach requires fundamental changes to the way that many agencies traditionally manage software development and other IT projects. As the report explains: “Agile presents an opportunity for tangible benefits and cost savings to the federal government if governance models for managing the technology program are adapted to support lighter deliverables, fixed resources and time, and variable scope.”<sup>15</sup>

Agile development is driven by a user-centered approach that integrates feedback throughout the entire process to ensure that the end users are satisfied with the products that result. Agile is often contrasted with older, “waterfall” approaches to software development. In a waterfall approach, developers plan the entire solution at the beginning, and “earn value” by progressing through milestones, like a waterfall cascading from one level to another.

An agile process is designed to be faster, more flexible, and more iterative. In agile development, teams develop a working minimal viable product (MVP), solicit feedback, and then pivot or persevere based on the results. The work takes place in short sprints, each with its own goals, and emphasizes demonstrable working solutions and continuous feedback to improve outcomes for end users.

## The Opportunity Project’s Agile Methodology

During Opportunity Project sprints, businesses, universities, and nonprofit organizations build digital products using open data from federal agencies and other sources. Data and policy experts from all levels of government, advocacy organizations, and product advisors participate to share their expertise and provide feedback during the sprint.<sup>16</sup> Using an agile methodology, TOP sprints are organized in a way that encourages rapid development of MVPs and continuous improvement with user feedback at every stage.

Collaboration constitutes an essential part of this agile methodology. The TOP team that leads the process brings in several kinds of participants for each sprint. As the TOP website describes, these sprint participants include:<sup>17</sup>

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14. Gorans, Paul and Kruchten, Philippe (2014) A Guide to Critical Success Factors in Agile Delivery, IBM Center for the Business of Government, Retrieved from <http://www.businessofgovernment.org/sites/default/files/A%20Guide%20to%20Critical%20Success%20Factors%20in%20Agile%20Delivery.pdf>

15. Gorans, Paul and Kruchten, Philippe (2014) A Guide to Critical Success Factors in Agile Delivery, IBM Center for the Business of Government, Retrieved from <http://www.businessofgovernment.org/sites/default/files/A%20Guide%20to%20Critical%20Success%20Factors%20in%20Agile%20Delivery.pdf>

16. The Opportunity Project, “The Sprint Process,” Retrieved from <https://opportunity.census.gov/sprint.html>

17. The Opportunity Project, “The Sprint Process,” Retrieved from <https://opportunity.census.gov/sprint.html>

## Tech Teams

Private sector companies, universities, nonprofits, and students participate as teams in sprints to build products that use open data. The tech teams design, own, and help to launch the products they build.

## Government

Federal government policy experts help to identify challenges facing the public in problem statements that define each sprint's goals. During the sprint, data stewards from federal agencies answer questions about open data to help the tech teams find and use the best data available to solve the problem. They also listen to feedback from sprint participants to make data more user-friendly.

## User Advocates

Community leaders with direct lived experience help tech teams design useful real-world products that can help solve a problem for the target end users. They are responsible for contributing expert knowledge from the intended user community, working with end users to develop specific use cases, and providing feedback to help tech teams deploy tools to end users.

## Product Advisors

Advisors from outside of government help the tech teams to ensure that the products they create will be scalable and sustainable after the formal sprint process concludes, so that they can reach their target end users and have real impact.

Upon joining the sprint process, tech teams, government, user advocates, and product advisors all receive detailed information and training materials about their specific roles and the milestones that will guide the 12-14 week technology development cycle. Each cycle includes user research, data exploration, product development, user testing, and product launch. All sprint participants are expected to join regular meetings based on these milestones that take place virtually through conference calls with screen-sharing capabilities. Participants are also encouraged to continue conversations outside of their regular meetings through email and Slack. The TOP leadership team circulates contact information for all sprint participants and encourages regular communication through general and problem-specific Slack channels. Many of these Slack channels are extremely active during sprints, and some remain active after the formal sprint timeline concludes.

## Changes to the Methodology

In the spirit of user-centered design and continuous improvement, The Opportunity Project has made several changes to its methodology since it launched in 2016. Key changes include:

- **Lengthening TOP development cycles from 6 to 8 weeks to 12 to 14 weeks.** TOP learned that additional time was needed to meet the project teams' goals.
- **Add key user research and data exploration at the beginning.** In order to emphasize and enable the user-centered nature of the sprint process, the TOP team adjusted the timeline to schedule user and data exploration early in the cycle, and move alpha and beta demos of the tech teams' digital tools to a later point so they can be informed by this early work.
- **Adding the "user advocate" role.** TOP added user advocates to address challenges in user engagement that surfaced early. Depending on their expertise, user advocates may help tech teams connect with user communities, contribute specific technical knowledge,

or provide insights into the value and use of different kinds of data. For example, user advocates from organizations like Coding it Forward and True Colors Fund have helped connect teams with potential end users, while others from the Urban Institute and CareerOneStop have provided access to application programming interfaces (APIs).

- **Using themes to focus development efforts.** In 2018, The Opportunity Project ran the first thematic development cycle with a cohort of experts in a specific field. The “geo-cohort” was featured in one of the two 2018 TOP development cycles in order to focus on high-value geospatial data assets such as the National Address Database (NAD), the Next Generation Weather Radar (NEXRAD), the National Agriculture Imagery Program (NAIP), and Topologically Integrated Geographic Encoding and Referencing (TIGER) products.
- **Building on established tools and platforms.** While TOP originally focused on creating entirely new web platforms and applications, many TOP projects now build on existing digital tools and platforms. This approach has been embraced by tech teams like eCivis and GreatSchools, which have used The Opportunity Project methodology to improve and expand their existing products. While some teams have successfully created new digital tools and platforms, building on an established product can help ensure sustainable results.

## New Elements in Development

In addition to these changes to the methodology, the TOP team is now developing and testing new elements, including new roles, milestones, and methods of engagement.

### Product Advisor

In 2018, the TOP leadership team added a new role to their methodology: the product advisor. These specialists from outside of government, such as experts brought in from Data XD in 2018, help teams create digital products with real-world impact. In 2018, access to product advisors enabled tech teams and government participants to be realistic about workflows and different categories of users. Many advisors pushed teams to create user personas and encouraged thinking about long-term goals. Looking forward, TOP can refine this new role and determine the best time for product advisors to contribute and the manner in which they can do so. While user advocates can help shape a project at the beginning, product advisors may become more important in the later stages of the development cycle.

### Product Sustainability Milestone

In 2018, the TOP leadership team added a new milestone to their methodology focused exclusively on product sustainability, replacing their previous “user testing” milestone. The product sustainability milestone serves as a peer-to-peer exchange between current and previous TOP tech teams, who share best practices and discuss how to ensure their projects have lasting impact. Looking ahead, TOP could consider formalizing this milestone and adding additional briefings for teams about product sustainability.

## In-Person Convenings

In 2018, TOP held in-person convenings to complement the largely remote sprint process. The first convening took place in Puerto Rico during August, in support of three of the four geo-cohort problem statements. TOP used the context of post-Hurricane Maria recovery to inform the development of data-driven tools for disaster preparedness, local address collection, and environmental stewardship.

This workshop brought participating tech teams together to build a stronger sense of community. The session drew strong participation, particularly from Puerto Rican organizations, and came early enough in the development cycle to help teams determine their approach to addressing the problem statements. The workshop also emphasized the benefits of involving local communities at an early stage.

Workshop organizers and participants saw the potential value of holding similar convenings for other problem statements, and also recognized areas for improvement, including reducing the length of the session and finding ways to follow up after the in-person convening. One tool that could be used after the workshop and throughout the development cycle is the Continuity Canvas, which can help maintain momentum by encouraging community validation and insight.<sup>18</sup>

The second convening, organized by the Center for Open Data Enterprise (CODE), supported the Treasury and OMB problem statements during November 2018.<sup>19</sup> This workshop was designed to (1) gather substantive input from users and user advocates to improve digital tools and platforms before their public launch, and (2) identify opportunities to help make them scalable and sustainable in the long term. The workshop focused on products developed by two participating tech teams, the eCivis Grants Intelligence tool and the REI Systems Grants Impact and Story Tool (GIST).

Tech teams viewed the in-person workshop especially favorably, according to feedback collected and evaluated following the event. Workshop organizers and participants also recognized areas for improvement, including hosting the event earlier in the development cycle in order to connect tech teams with end users. They also recognized an ongoing need to bring in non-sprint participants who can join sprint participants to provide broader input.

Like the earlier convening in Puerto Rico, this workshop had strong participation and helped to create a sense of community. Unlike the Puerto Rico workshop, however, this event occurred towards the end of the development cycle and was designed to help refine and support products already in beta testing.

## Benefits for Key Stakeholders

The Opportunity Project relies on the commitment of four different stakeholder groups: tech teams, government agencies, user advocates, and product advisors. As the table below shows, each group has strong incentives to participate. The success of The Opportunity Project derives largely from the benefits for each group—benefits confirmed in interviews across these diverse stakeholders. In particular, TOP offers multiple benefits to tech teams and government, the two groups whose participation is essential to drive projects forward.

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18. Alvarez, Marcelino, "Post-Sprint Recovery: Introducing the Continuity Canvas," October 8, 2018, Retrieved from <https://within-tent.uncorkedstudios.com/introducing-the-continuity-canvas-bb002000bf3b>

19. A summary of findings from this workshop is available from the authors on request.

**Table 1: Four Different Stakeholder Groups**

<b>Benefits for the Public</b>			
Facilitates cross-sector collaboration		Makes government data more usable and accessible	Create impact for families, communities and businesses
<p><b>Benefits for Tech Teams</b></p> <p>Advances public relations and corporate social responsibility</p> <p>Builds relationships with government and other organizations</p> <p>Bypasses traditional procedures and/or legal constraints through a lightweight approach</p> <p>Connects government data users with data stewards</p> <p>Opens new or existing business channels</p>	<p><b>Benefits for Government</b></p> <p>Modernizes approaches to collaborative problem solving</p> <p>Bypasses traditional procedures and/or legal constraints through a lightweight approach</p> <p>Leverages talent of external technologists, developers, and designers to tackle public problems</p> <p>Translates government data into valuable digital tools for the public that would otherwise not be possible</p>	<p><b>Benefits for User Advocates</b></p> <p>Applies direct lived experience to inform the use of government data</p> <p>Builds relationships with government and other organizations</p> <p>Ensures that the needs of the communities they represent have priority in data-driven government programs</p>	<p><b>Benefits for Product Advisors</b></p> <p>Ensures that digital products created can reach end users and have real impact</p> <p>Provides opportunity to shape how tech teams sustain and scale their digital tools over the long term</p> <p>Builds relationships with government and other organizations</p>

*Tech teams* often join TOP to gain greater access to government data that can help accelerate their business plans for new data-driven applications. They benefit greatly from direct access to government data stewards who can answer their questions, and help them better understand datasets integral to their core business. Some may use TOP as a lab to develop a proof of concept for an important use case involving government data. Others may benefit from the chance to design and develop an innovative solution with input from government agencies, in contrast to traditional procurement processes designed to meet agency goals.

Many companies also see TOP as an opportunity to improve their brands. They can make a visible commitment to the part of their mission that includes providing public value. And through their work on TOP, they can demonstrate and market their capabilities to potential partners and government clients. One tech team leader said that working with TOP “was a game-changing experience for our team. Our small startup helped a government agency get smarter about their data. The benefit will extend far beyond the end date” of the work effort.

*Government agencies*, for their part, can use TOP to access private-sector expertise more easily than they could otherwise. Most federal agencies can only hire private sector support if they have sufficient funds, and even then, must go through a complex procurement process that may make it difficult to bring in companies with the most relevant expertise. At the same time, federal regulations may prohibit companies from working for agencies on a volunteer basis. TOP provides a way for companies to volunteer their time and expertise by working

*with* government agencies on projects designed to benefit the public, rather than working *for* those agencies by providing direct services for free.

Under this model, federal agencies can use TOP as a way to engage with companies to fulfill the agency's mission to serve the public. "These are people who are using our data to provide something to the public, and delivering value to the public is our success story," said the agency lead on one TOP problem statement. "So, we want to support that work any way we can. TOP gives technology companies the platform to do something for the public good, and it gives them access to people in the federal government who can help them do that." For government participants, the TOP process also allows them to accelerate understanding and adoption of new technologies such as AI. As one member of the TOP leadership team noted, government participants "go through the process and see the end result, and they see this is a new way to use data or administer services. It plants the seed for initiatives and changing how they do business in the future. It's a soft approach to change management."

TOP's commitment to *user advocates* who lead engagement and user-centered design enables those advocates to ensure that TOP's products will benefit the users they represent. User advocates also have the opportunity to build relationships with government agencies they work with. One government lead said that the greatest benefit of TOP for federal data stewards is "learning about user-centered design and taking those lessons back into their daily lives, and connecting with data users who can give them feedback about the value of their data. One of the great things about TOP is bringing the concept of user-centered design into government."

Finally, TOP's inclusion of *product advisors* adds another layer of input to the development process, ensuring that the digital tools developed by tech teams have real-world impact. By participating in the sprint process, product advisors have an opportunity to share their expertise with the community and build relationships with government and industry in the process.

## Demo Day

At the Demo Day that concludes each year's TOP development cycles, tech teams present their digital tools and platforms to a large public audience. Demo Day is an exciting, all-day event including a combination of fast-paced presentations and exhibit space to enable attendees to interact directly with the tech teams and their digital tools and platforms.

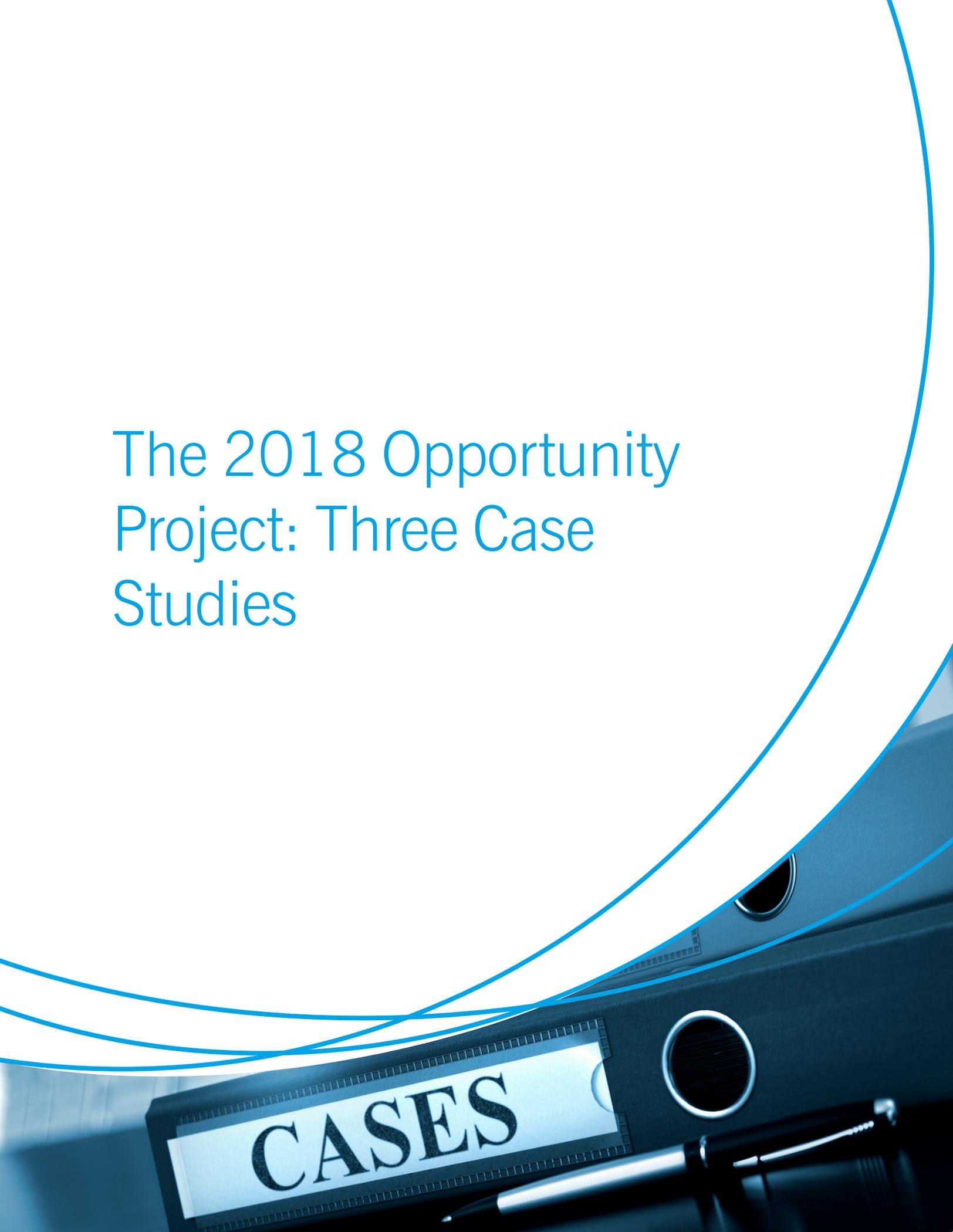
Demo Day provides a unique opportunity for teams to meet each other and the TOP organizers. TOP sprints are conducted virtually, through Slack channels and large-group conference calls with screen-sharing capabilities. At Demo Day, federal data stewards, user advocates, product advisors, and the TOP teams come together in person to launch the products they developed over the last 12-14 weeks. Tech teams from previous development cycles also attend.

The 2018 TOP efforts concluded in March 2019 with an in-person Demo Day at the U.S. Census Bureau in Maryland. Tech teams showcased more than 20 new digital tools and platforms throughout the day, and over 200 people from government, industry, and civil society attended the event. Senior leaders from the White House Office of Science and Technology Policy, the U.S. Department of Commerce, and many other federal agencies gave keynote remarks and showed their support for The Opportunity Project. Much of the day was also live-streamed and is available for public viewing through The Opportunity Project Press Kit.<sup>20</sup>

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20. U.S. Census Bureau, "The Opportunity Project Press Kit," Retrieved from <https://www.census.gov/newsroom/press-kits/2019/opportunity-project.html>

# The 2018 Opportunity Project: Three Case Studies

A blue folder with a white label that says "CASES" in black capital letters. A silver pen is resting on the folder. The background is white with a large blue circular graphic element on the right side.

**CASES**

The Opportunity Project convened two technology development cycles during 2018. The first, which began in the summer of 2018, included problem statements from the Departments of Education, Labor, Treasury, and the Office of Management and Budget.<sup>21</sup> For this effort:

- The Department of Education focused on two problem statements: (1) Promoting access to and interest in STEM fields,<sup>22</sup> and (2) Helping states develop education report cards.<sup>23</sup>
- The Department of Labor (DOL) focused on the following problem statement: Using artificial intelligence (AI) to connect veterans with registered apprenticeships.<sup>24</sup>
- The Department of the Treasury and the Office of Management and Budget worked together on two problem statements: (1) Increasing government accountability by connecting federal spending and performance data,<sup>25</sup> and (2) Improving access to and management of federal grants.<sup>26</sup>

The second, referred to as the “geo-cohort,” started in the fall of 2018 and included problem statements from the U.S. Departments of Agriculture, Commerce, Homeland Security, and Transportation, and the Office of Science and Technology Policy.<sup>27</sup> For this effort:

- The Forest Service at the Department of Agriculture focused on: Identifying and strengthening civic environmental stewardship.<sup>28</sup>
- The Census Bureau at the Department of Commerce and the Department of Transportation worked together on: Helping tribal, state, and local governments with local address data collection.<sup>29</sup>
- The Federal Emergency Management Agency (FEMA) at the Department of Homeland Security focused on: Using geospatial data to help people prepare for disasters.<sup>30</sup> The problem statement was framed in the context of FEMA's strategic effort to build a culture of disaster preparedness across the nation.<sup>31</sup>
- The Office of Science and Technology Policy focused on: Harnessing data and leveraging digital tools to combat the opioid crisis.<sup>32</sup>

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21. The Opportunity Project, “2018 sprint Information,” Retrieved from [https://opportunity.census.gov/data/2018\\_problem\\_statements.pdf](https://opportunity.census.gov/data/2018_problem_statements.pdf)

22. The Opportunity Project, “Promoting Access to and Interest in STEM Fields,” Retrieved from <https://opportunity.census.gov/data/2018-stem.pdf>

23. The Opportunity Project, “Helping States Develop Education Report Cards,” Retrieved from <https://opportunity.census.gov/data/2018-reportcard.pdf>

24. The Opportunity Project, “Using AI to Connect Veterans with Registered Apprenticeships,” Retrieved from <https://opportunity.census.gov/data/2018-ai.pdf>

25. The Opportunity Project, “Increasing Government Accountability by Connecting Federal Spending and Performance Data,” Retrieved from <https://opportunity.census.gov/data/2018-accountability.pdf>

26. The Opportunity Project, “Improving Access to and Management of Federal Grants,” Retrieved from <https://opportunity.census.gov/data/2018-grants.pdf>

27. The Opportunity Project, “Geo-Cohort Sprint Information,” Retrieved from [https://opportunity.census.gov/data/geo\\_cohort\\_problem\\_statements.pdf](https://opportunity.census.gov/data/geo_cohort_problem_statements.pdf)

28. The Opportunity Project, “Identifying and Strengthening Civic Environmental Stewardship,” Retrieved from <https://opportunity.census.gov/data/2018-environ.pdf>

29. The Opportunity Project, “Helping Tribal, State, and Local Governments with Local Address Data Collection,” Retrieved from <https://opportunity.census.gov/data/2018-address.pdf>

30. The Opportunity Project, “Using Geospatial Data to Help People Prepare for Disasters,” Retrieved from <https://opportunity.census.gov/data/2018-disasters.pdf>

31. U.S. Department of Homeland Security, Federal Emergency Management Agency, “2018-2022 Strategic Plan,” Retrieved from [https://www.fema.gov/media-library-data/1533052524696-b5137201a4614ade5e0129ef01cbf661/strat\\_plan.pdf](https://www.fema.gov/media-library-data/1533052524696-b5137201a4614ade5e0129ef01cbf661/strat_plan.pdf)

32. The Opportunity Project, “Harnessing Data and Leveraging Digital Tools to Combat the Opioid Crisis,” Retrieved from <https://opportunity.census.gov/data/2018-opioids.pdf>

The following three case studies from 2018 demonstrate the different ways that tech teams approached these problem statements and the kinds of strategies and outcomes that TOP's agile problem solving process makes possible. The first case study demonstrates how tech teams helped an agency evaluate a cutting-edge approach and determine its large-scale feasibility. The second shows how tech teams with a common set of problem statements integrated user feedback into their development work. And the third case study highlights how one team used TOP to work across a range of sectors and problem statements.

## CASE STUDY 1

### HELPING VETERANS FIND JOBS—AND ASSESSING THE VALUE OF ARTIFICIAL INTELLIGENCE

Focusing their efforts on the Department of Labor's problem statement, a tech team from Shift.org developed an innovative digital tool using AI to connect veterans with available apprenticeships across the United States. This problem statement provided a unique opportunity to explore the application of AI using open data, serving as a proof of concept and a way to engage in collaborative problem solving inside and outside of government. The problem statement, "Using AI to connect veterans with registered apprenticeships," attracted particular attention from government and non-government participants alike.

The challenge, as the U.S. Department of Labor spelled it out, was to "Develop tools that use artificial intelligence algorithms or natural language processing technology to match veterans to registered apprenticeship programs." It was meant to address the difficulty that veterans have in translating their military skills to civilian work so that they can find jobs best suited to them. Bridging that gap could make apprenticeship programs for veterans, and the job training they provide, much more relevant and effective.

This challenge was especially intriguing and promising because it applied cutting-edge technology to a problem with potentially high social impact. While TOP generally focuses on launching functional tools, this problem statement demonstrated that a project can be successful even if it does not produce a fully operational product. The challenge of applying AI to veterans' employment is so complex that even a proof of concept would have value. As one government participant pointed out, a project could also have value if it showed that AI was not a good approach to this problem. For government technologists, knowing that a technical approach is unproductive can save a great amount of misplaced effort.

The tech team's efforts demonstrated that AI has real promise in helping veterans find career paths. And as an opportunity to explore an important new technology, the use of AI made it worthwhile for tech teams to invest time and effort attacking the problem.

## CASE STUDY 2

### IMPROVING FEDERAL GRANT MANAGEMENT WITH USER INPUT

The Department of the Treasury and the Office of Management and Budget developed two related problem statements for the tech teams to focus on: the first, to “Increase government accountability by connecting federal spending and performance data;” and the second, to “Improve access to and management of federal grants.” The challenge was meant to help reduce the burden on federal grant recipients, who report spending 40 percent of their time on compliance and reporting requirements rather than working to deliver on their missions. With about \$700 billion invested annually through more than 1800 diverse federal grant programs, the potential benefit of improving grants management is huge.

In November 2018, as described above under “In-Person Convenings,” Treasury and OMB hosted a Federal Grants and Government Accountability User Engagement Workshop for the TOP challenge. At the Workshop, eCivis and REI Systems, two participating tech teams, presented beta versions of the tools designed to help federal grantees and others with an interest in federal grantmaking.

The beta version of the eCivis tech team tool, called Grants Intelligence, focused specifically on grants pertaining to homelessness in a way that allows for interstate comparisons. Workshop participants suggested that this tool would also be useful to grassroots and nonprofit organizations and state and local governments. They suggested improving the tool by incorporating data at the community and city level, information about welfare programs, and descriptions of state, local, and philanthropic funding sources.

At the same User Engagement Workshop, the REI Systems tech team presented its Grants Impact and Story Tool (GIST), which visualizes the connection between federal spending and performance data. Participants in the Workshop suggested that GIST could be useful to members of Congress and the news media as well as researchers and federal program managers. They also suggested that adding geospatial data could allow users to visualize the impact of awards at a state or regional level. To make the tool sustainable, participants suggested adopting the Federal Integrated Business Framework (FIBF),<sup>33</sup> an ongoing shared services initiative led by a coalition of government agencies to create a scalable, sustainable data ecosystem including standardized data elements.

An informal survey taken after the User Engagement Workshop showed that tech team members found it very helpful, with a rating of 4.5 out of 5 for utility. At the 2019 Demo Day, one tech team member from REI said that the Workshop had been particularly helpful to them in thinking about their product’s sustainability, while a team member from eCivis said that the Workshop showed them the need to make their product much simpler to use. Based on this experience, and the 2018 event held in Puerto Rico, TOP may want to develop a user engagement strategy that combines in-person Workshops with virtual convenings like those they hold now.

33. <https://ussm.gsa.gov/fibf>

## CASE STUDY 3

### APPLYING GEOSPATIAL KNOWLEDGE TO CHALLENGES ACROSS SECTORS

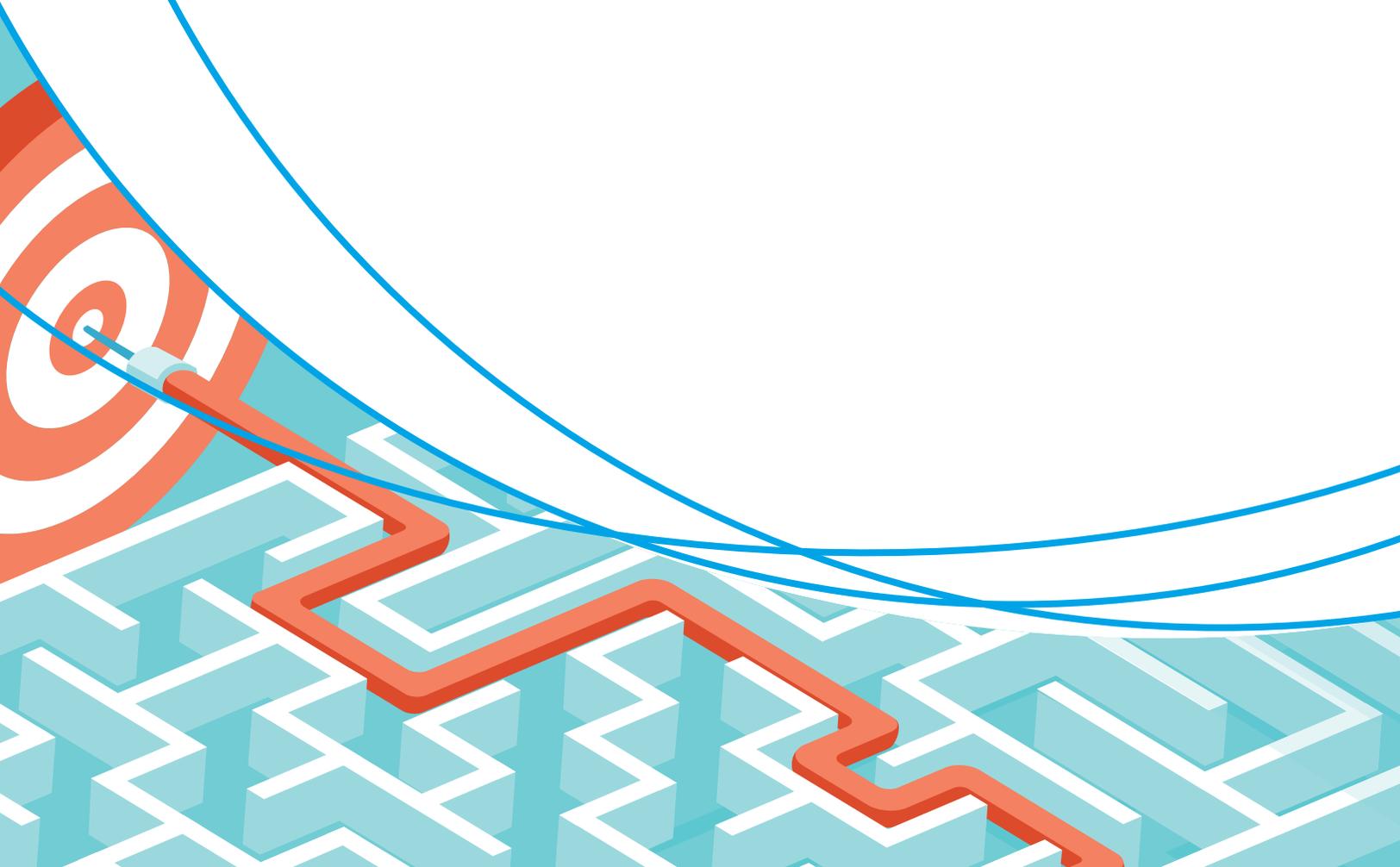
The second 2018 TOP development cycle was designed to include problem statements that all related to the use of geospatial data, for goals as diverse as environmental stewardship, disaster preparedness, and addressing the opioid crisis. For the first time, this thematic approach enabled participants to work across several problem statements using common approaches. Dave Jones, the CEO, President, and Founder of StormCenter Communications, saw this as a particular pathway to make a contribution.

In an interview, Jones said that he first learned about The Opportunity Project from TOP's director at a Roundtable hosted by the Office of Management and Budget. Jones saw the TOP sprint as an ideal opportunity to apply GeoCollaborate, collaborative software for geospatial data. GeoCollaborate "is a network service that permits real-time data sharing and collaboration across an unlimited number of disparate web maps."<sup>34</sup>

When Jones and his team joined TOP, they had been funded by the government's Small Business Innovation Research program in a way that enabled them to contract easily with any federal agency. As Jones put it, "TOP has given us the chance to connect and team up with agencies to apply this technology to issues they have to address. Many of the tech teams were looking to develop tech to address a specific problem statement. We had a unique technology to offer, so we were talking to the problem statement leads to see how our technology could make their work more effective." Through their work with TOP, StormCenter connected with the Department of Health and Human Services and the Department of Homeland Security, among others.

34. StormCenter, "GeoCollaborate," Retrieved from <http://www.geocollaborate.com/>

# Lessons Learned: Challenges and Successes



This study of The Opportunity Project provides a number of lessons from TOP's challenges and successes, which can inform agencies as they work with TOP and develop similar programs focused on their own mission space.<sup>35</sup> These learned lessons are presented here using the seven stages outlined in TOP's toolkit:

1. Choose a Problem
2. Form a Team
3. Conduct User Research
4. Explore Data
5. Design and Build
6. Share the Product
7. Keep Improving

## 1. Choose a Problem



### Challenges:

**Timing of user engagement.** While participants agreed on the importance of user engagement, the tech teams varied greatly in the degree to which they involved user advocates in their process. A particular challenge is that TOP does not directly engage user advocates when developing problem statements.



### Successes:

**Thematic approach to problem statements.** For the first time in 2018, The Opportunity Project used themes to organize and provide focus for their sprints. The second tech development cycle in 2018 was organized around the idea of a “geo-cohort,” bringing together experts in geospatial data and enabling them to address a range of related problem statements. This approach made it possible to tackle a number of problem statements simultaneously using the federal government's substantial geospatial data assets.

## 2. Form a Team



### Challenges:

**Limitations on time and resources.** Tech teams varied in their ability to devote time and dedicated staff to their projects. Those that could allocate more time and resources tended to develop more finished and sustainable products, while those with fewer resources generally produced less complete concepts or decided to stop participating altogether. One former participant noted that for many tech teams, having key dedicated resources available throughout the duration of a 12-14 week development cycle is not feasible. This participant also found that it makes planning around the built-in milestones difficult; and that capacity planning needs to be taken into consideration at the beginning of the cycle.

35. The Opportunity Project, “The Opportunity Project Toolkit,” Retrieved from <https://opportunity.census.gov/toolkit.html>

**Successes:**

**Diverse types of expertise.** 2018 TOP efforts brought in a wider array of team members from nonprofits and academia than before. In some cases, these team members had fewer resources to apply than tech teams from the private sector. However, they made a particularly strong contribution through the geo-cohort themed development cycle.

**Diverse forms of collaboration.** Some teams collaborated with each other, or interacted with a number of different teams. For example, StormCenter worked on several problem statements concurrently. Some teams, such as Civis Analytics, also worked with external partners that weren't participating in TOP.

**New public-private connections.** By connecting with tech teams, federal agencies could tap into resources needed to put their ideas into action. At the same time, The Opportunity Project gave tech teams access to government data providers who could help them find and use key datasets.

### 3. Conduct User Research

**Challenges:**

**High variation in user engagement.** The Opportunity Project team recruited user advocates, invited them to all group calls, and made their contact information easily available to all participants. The TOP team also included a dedicated user advocate coordinator who offered suggestions on methods for user research, and helped facilitate introductions between tech teams and specific user advocates. However, different teams varied greatly in how they engaged with these representatives of the user community. Also, participation on group calls was not an effective way to provide the user perspective; user advocates were not always available to join the calls, and when they could join, they had only a few minutes to provide quick input. As one agency lead put it, "Simply having user advocates available isn't enough to ensure that they will be used as much as they could be."

In addition, since TOP involves a relatively small number of user advocates, the available advocates may not have the level of knowledge or insights that some tech teams need. And if a tech team changes approach or focus during the course of development, the relationships they build with user advocates early in the process may become less useful over time.

**Difficulties with user personas and scenarios.** Several tech teams and government data stewards were not familiar with the concept of user personas, and may not have understood their data customers well enough to develop personas. The TOP team provides resources including sample user scenarios on their website, but it is not clear how much these were used and applied.

**Confusion surrounding the relationship between government and end users.** TOP is intentionally designed to produce products that will benefit the public at large, and not to provide free technical expertise to government agencies to fulfill their own goals. However, because problem statements were largely defined and driven by federal agencies, tech teams had a tendency to turn to the agencies for guidance rather than turning to the user advocates who represent end users in the public.

**Successes:**

**Several successful demonstrations of the value of user engagement.** Several teams engaged user advocates early and often. Those teams largely credited user advocates with helping to shape their work, from problem definition through product development. User advocates ranged from the Choctaw Nation of Oklahoma who participated in the Treasury and OMB problem statements, to GreatSchools who gave input to the Department of Education, and veterans who provided user feedback for the Department of Labor's problem statement.

**Two new approaches to in-person user engagement piloted in 2018.** From the beginning, The Opportunity Project has functioned almost exclusively through virtual convenings and participation. Agency representatives, tech teams, and user advocates have connected by phone and online conferencing, only meeting in person at the Demo Day. In 2018, TOP participants pilot-tested two in-person approaches at different stages, as described above. In one of these pilots, agency leads in the Department of the Treasury and Office of Management and Budget convened a User Engagement Workshop to obtain feedback on beta versions of two projects that addressed their problem statements. In the other pilot, TOP leaders convened a special meeting in Puerto Rico to bring together experts in the use of geospatial data for the wide range of problem statements focused on during that effort.

## 4. Explore Data

**Challenges:**

**Difficulties accessing and using key datasets.** Although TOP promotes the application of open government data, several tech teams struggled to access data they wanted to use for their projects. For example, teams working on the veterans apprenticeship problem statement wanted to use plain-text resumes to develop machine-learning algorithms, but could not acquire this data from federal data stewards. Some teams had to rethink concepts after several sprints and others noted problems with data access, accuracy, timeliness, or completeness that did not appear until development efforts had progressed substantially. They suggested tackling these issues early on so that tech teams can figure out how to address them.

**Successes:**

**New connections around data use.** Despite some limitations, tech teams could access enough government data sources to fuel their projects, and made new connections in the process. Many federal data stewards were very involved and reachable through group calls and other channels, including Slack. The TOP process has helped build relationships between government data providers and data users, and several of these collaborative connections have extended beyond the end of development efforts. Some participants have continued to share updates and progress with federal data stewards after their Demo Day. As data users, many participants have also become part of a valuable feedback channel with government data providers as they work to optimize their agency's publicly available data assets.

**Innovation sparked by data limitations.** In some cases, limitations on available data have led tech teams to develop innovative solutions that may have benefits beyond TOP. In the absence of resume data for veterans, for example, the tech team led by Shift.org turned their attention to occupational data available through the Department of Labor's O\*NET system, which contains hundreds of standardized descriptors of occupations covering the entire

U.S. economy.<sup>36</sup> Shift.org improved O\*NET in ways that enabled them to develop their digital tool, creating a version of O\*NET that could prove useful to other developers as well.

**Demonstration of why government data matters.** In presenting the results of sprint efforts, both in written descriptions and at Demo Day, participants cited a wide variety of government datasets that different agencies had provided to make their projects possible. These live examples help make the case for the value of open government data, and for government agencies to open their data more effectively to support applications by tech innovators.

## 5. Design and Build



### Challenges:

**Limitations of alpha and beta demos.** The primary means of feedback for alpha and beta demos was through large-group conference calls with screen sharing capabilities. These calls had several structural limitations. A large number of demos were presented over a relatively short time on each call so that feedback came from quick reactions to the demos, rather than any opportunity to explore them in depth. A high level of variability appeared among the alpha and beta demos given that many tech teams were at different stages of development. During alpha demos, for example, some teams presented short slide decks while others presented fully functional websites. Some presentations also had technical difficulties. The TOP team has faced constraints finding conference call systems and collaborative tools that federal government agencies can use without encountering firewalls and other technical limitations.

**Difficulty in tracking progress.** TOP development cycles are designed to give tech teams feedback at both the alpha and beta stages of product development to help improve their products. While TOP encourages tech teams to focus alpha and beta demos on addressing specific issues, it was difficult to distinguish updates or major changes between these stages. Clearer tracking of changes and improvements would show responsiveness to input and feedback, and could provide insights into the product development process.



### Successes:

**Structured demos to keep projects on track.** Despite limitations of the alpha and beta demos, tech teams found that the feedback they received through these demos, as well as through Slack or other channels, was helpful to them. In addition, simply having scheduled demos created a production timeline that helped teams stay on track.

## 6. Share the Product



### Challenges:

**Tech teams dropping out before they can share their work.** A handful of tech teams that started the 2018 TOP development cycles did not make it to the final stages of the process, including Demo Day. Those that dropped out cited concerns about limited resources and said they ultimately did not have the capacity to participate in a 12-14 week technology development exercise. Some noted the need for a clearer pathway for tech teams not ready to launch “production-ready” MVPs at Demo Day.

36. O\*Net OnLine, Retrieved from <https://www.onetonline.org/>

**Limited opportunities to connect to supporters.** Demo Day gives tech teams an opportunity to showcase their work for potential support and investment from anyone who comes to the event. However, the extent of these connections made at Demo Day, which is not structured to match projects to specific funders with an interest in that topic, is not clear. The Opportunity Project should continue to explore other ways to help tech teams find the resources needed to make products sustainable.



#### Successes:

**Using Demo Day as an effective, high-energy showcase.** The 2019 Demo Day was an impressive event. Over 20 digital tools and platforms that teams built with open data during the 2018 TOP efforts were launched. The 2019 Demo Day also featured solutions developed during a TOP development cycle convened by the U.S. Department of Health and Human Services (HHS), which is described in this report. TOP brought in communications experts to design Demo Day with dynamic speakers, effective presentations, and keynotes from government leaders—all live-streamed and made available online—as well as a large exhibition space. Demo Day attracted a large number of participants and demonstrated a high level of professionalism.

## 7. Keep Improving



#### Challenges:

**No clear path for scalability and sustainability.** A major goal of The Opportunity Project is to develop scalable and sustainable products that provide benefits to the public. However, TOP tech development cycles lack a clear process or goalposts to facilitate this. Since the Demo Day provides only a limited opportunity for teams to develop support for products, collaborations to scale and sustain this work need to take place after the work is concluded—with no clear structure for how to develop and use those relationships.



#### Successes:

**New role and approach piloted in 2018.** As described above, the product advisor role was introduced in 2018 to help teams scale and sustain their products. The User Engagement Workshop held in support of the Treasury and OMB problem statements also included a breakout session focused on scalability and sustainability, and addressed identifying potential partners or collaborations to ensure continuity for the products developed.

# Recommendations



The 2018 TOP development efforts presented various challenges and successes in the application of agile problem solving within government. Based on those observations, the following ten recommendations could strengthen the impact of The Opportunity Project itself, and the manner in which federal agencies adopt and adapt the approach more broadly.

 **(1) Improve the process for developing problem statements.** Problem statements are now driven almost entirely by the sponsoring federal agencies and conceptualized with little input from potential end users. It would help to identify users and user advocates early on, and engage them in defining problems to be solved from the beginning. In addition to ensuring that problem statements address users' most important concerns, this approach could help refine the problem statements at the beginning to focus the work of the tech teams. One agency lead for the Treasury and OMB problem statements noted that the focus of problem statements needed to be continuously refined, and that it would have been more efficient to narrow the focus early on. For example, a goal to "improve federal grantmaking" could have been given a more specific focus to "improve federal grants for opioid crisis response."

 **(2) Align sprint cycles with a theme.** 2018 saw the introduction of themed development cycles in TOP; the "geo-cohort" was the theme selected to be first. This approach had several advantages. First, a geo-cohort enabled some tech teams, notably StormCenter, Loveland Technologies, and Spatial Networks, to work across several problem statements and apply common technical solutions to diverse problems. Second, the thematic approach also made it possible to convene subject matter experts at a workshop in Puerto Rico, which would not have been logistically practical for a single problem statement. Finally, engaging the geospatial community may help make the products more scalable and sustainable by leveraging established networks.

TOP and other agencies could consider expanding the geospatial theme with new problem statements in the future. This could also include consideration of other broad themes to help apply common approaches across federal agencies, such as health care, workforce development, or access to public services, and could encourage the development of problem statements aligned with priorities identified by each presidential administration.

 **(3) Ensure access to critical data during sprints and in the long term.** As tech teams work with federal data, they may uncover issues of data quality, usability, and access that federal agencies should address. TOP leadership should consider ways to work with these agencies to ensure that key datasets are made available as tech teams discover relevant data needs. For example, Shift.org, a California-based nonprofit that matches veterans to fellowship programs, could not gain access to key data from DOL and the Census Bureau, even though the datasets they wanted had been cleared for public access.

TOP could also help tech teams find ways to access non-federal data of potential importance. The Federal Grants and Government Accountability User Engagement Workshop, held in November 2018, underscored the value of combining federal, state, and local data for some TOP problem statements. TOP could encourage more state and local participation, for example, by including state and local user advocates for relevant problem statements.

Finally, TOP and the agencies it works with could help ensure the availability of key datasets throughout the development cycle, so that the applications that rely on the data are both sustainable and scalable. This should include availability not only for data released by the agencies, but for improved datasets developed during the sprints. For example, as described above, Shift.org developed an improved version of O\*NET, the Occupational Information Network maintained by DOL, with a new data infrastructure that makes more data available. Shift.org is now considering developing an open source version for wider release. TOP could work both

with federal agencies and with cross-agency data portals like Data.gov to make such improved datasets easily available.



**(4) Share more information about the use of each agency's data.** TOP now highlights datasets used in each product that tech teams develop. TOP could also share its results on an agency-by-agency basis to highlight each agency's contribution. For example, TOP could list and describe all products that used FEMA data, give details on the most useful FEMA datasets, and provide links to any resources that tech teams found helpful in applying the data. This would help show federal data stewards valuable ways to use their data, help data users understand better how to apply the data resources each agency offers, and show agencies a model for increasing the value that public, private, and nonprofit sector partners derive from their data.



**(5) Recruit participants and supporters strategically.** A number of TOP participants, including tech teams, user advocates, and federal agencies, participate in TOP year after year. While this continuity is a strength, TOP and the agencies it works with would also benefit from expanding their network. TOP, which often finds new participants through serendipity, could develop more systematic and strategic outreach. For example, TOP could approach local universities, startup hubs, and accelerators to address relevant problem statements, or identify new groups with a strong user interest in a specific problem addressed in a sprint. Focusing problem statements more clearly at the outset would help in this outreach.

The TOP team also hopes to include a new group of stakeholders: the philanthropic community. The Opportunity Project, from the beginning, has focused on developing applications that can directly benefit American citizens and communities. As their work continues, TOP could reach out to philanthropies that can support individual projects aligned with their program areas, which can also increase the collaborative network across agencies that perform similar work.



**(6) Further engage users and user advocates.** End users and user advocates could engage more thoroughly and effectively throughout the TOP process. As noted above, it would help to engage the user community at the beginning in formulating problem statements. Visible early engagement could help create especially relevant problem statements, and would also demonstrate to tech teams that end users, not federal agencies, are the ultimate clients for their work.

TOP could also consider adjusting its methodology to allow input from a larger range of user advocates for each problem statement. TOP's current process identifies a small number of user advocates and asks them to participate at all stages of the 12-14 week development cycle. In addition to this core group of participants, TOP could also work with tech teams and federal agencies to reach out to more users for input at key points, such as the release of alpha and beta demos. The Treasury and OMB User Engagement Workshop did this through an in-person convening, but input could also be invited through online and/or phone participation.



**(7) Build community through in-person convenings and focused virtual meetings.** Rather than operating exclusively through virtual groups, as it has in the past, TOP could move towards a hybrid model of virtual and in-person convenings throughout the entire development cycle. The workshops in Puerto Rico and Washington, D.C. during 2018 represent possible models for in-person gatherings. TOP may want to study the results of those two events to determine their successes and shortcomings as a guide to future in-person work. In addition, TOP may want to more clearly define kickoff meetings, user engagement workshops, and demo days as early as possible so that participants can plan accordingly.

TOP, and agencies adopting similar approaches, could also consider shifting from having large group calls that involve all sprint participants to a more focused approach. For example, having a one-hour call on a specific problem statement with only the relevant stakeholders, rather than devoting 20 minutes to that problem statement on a call with a much broader group, could provide more extensive and focused feedback and help build a sense of community among people working on that problem. While this would require a greater time commitment, tech teams could be tasked with organizing these calls to promote buy-in.

 **(8) Focus on scalability and sustainability.** While the TOP process provides some resources for tech teams to work on scalability and sustainability, these goals are not fully built into the process. The addition of a milestone focused on scalability and sustainability reflected a useful improvement in 2018. TOP could consider adding a stage at the beginning of each tech development cycle for more focused work on these goals. It would also help to better define the relationship between the end products, tech teams, and government agencies after development efforts are concluded.

Demo Day, now a well-established part of the TOP program, provides a particular opportunity to help tech teams connect with potential funders who can support them in building on their work. Invitations to Demo Day cast a wide net and attract a large number of attendees, but many are not in a position to help support the work of the tech teams going forward. TOP could consider more targeted outreach to relevant foundations, venture funds, and others who may have interest in these projects and resources to help them scale, which could also expand the network of stakeholders available to other agencies that seek to implement similar agile approaches.

 **(9) Consider additional measures of success.** The way TOP tracks and reports on its products may understate the program's impact. Regardless of whether or not every TOP development cycle produces high-value applications using open government data, the collaborative process fostered through TOP brings federal agencies into the agile development methodology and exposes them to innovative solutions from data users across industry, nonprofits, academia, and the general public. The process forces agencies to think about data in different ways and supports the development of an agile, flexible, and human-centered government skillset. For many TOP problem statements, the most important product may be the process itself.

Several TOP projects have led to more sustained changes in how agencies manage and use their data. In 2018, the teams working on the use of AI for veterans' apprenticeships did not expect to have a full-scale product by the end of the 12 weeks, but developed valuable insights and methodologies that will pay off in the months and years ahead. By tracking such successes over time, TOP can help agencies develop ongoing use cases that demonstrate long-term value.

 **(10) Expand the methodology across government and beyond.** TOP has now worked with about a dozen federal agencies. This critical mass can now leverage the TOP methodology to spin off their own projects in the service of mission delivery and user-centric data applications. The first such agency application, now referred to as the HHS Health Tech Sprint, launched in October 2018. The success of this effort, described below, shows that the TOP approach can be adapted by other agencies, and potentially other types of organizations, to address complex public problems. TOP could consider encouraging similar adoption by universities, startup incubators, or state and local governments.

## EXPANDING THE SCOPE: ADAPTING THE TOP METHODOLOGY IN THE “HEALTH TECH SPRINT”

The Opportunity Project provides a repeatable methodology that could be adapted for use across the federal government. By documenting a replicable, agile process, TOP has shown how federal agencies can make rapid progress in finding new uses for their data resources. In October 2018, HHS became the first federal agency to apply TOP’s methodology on its own.

There were two parallel projects in what became known as the “Health Tech Sprint” development cycle, a joint effort between HHS and the Presidential Innovation Fellow (PIF) program showcased at the White House in early 2019. One track was an artificial intelligence (AI) challenge designed to improve clinical trial matching for patients, led by Presidential Innovation Fellow Dr. Gil Alterovitz. The other track focused on Lyme and tick-borne diseases, led by Dr. Kristen Honey and the HHS Office of the Chief Technology Officer.<sup>37</sup> This effort focused on leveraging crowd- and patient-based data insights with a goal to “Harness the power of collaboration, citizen science, and data for Lyme disease.”

According to Dr. Alterovitz, the AI work began after seeing the need to engage industry with datasets to develop AI for matching patients to clinical trials. While researchers worked with several useful datasets, there was no “AI ecosystem” that could provide access to the various inter-related datasets needed to train and test artificial intelligence solutions. “The focus of the tech sprint was on creating AI-able data for an AI ecosystem,” said Dr. Alterovitz. That focus required “a novel approach ... to finding and engaging companies and other players.” Working with the National Cancer Institute, the General Services Administration, and personnel and resources across a dozen agencies, the leaders of the Health Tech Sprint recruited tech teams from major companies, as well as smaller, innovative health technology companies.<sup>38</sup>

For the AI track, the HHS/PIF team used a time frame for the tech development cycle similar that of TOP, using a development cycle of 14 weeks. This team also used the same three-part sequence of work: (1) input from users and patient advocates, (2) building a prototype, and (3) developing the final version for Demo Day. The main change in the AI project was using a different approach to data, releasing data at intervals on the Health Tech Sprint website<sup>39</sup> rather than all at once so that companies could use the data to train and test their AI solutions. “Developing accurate AI tools necessitates building a model with one set of data, which acts like its homework, and then testing it on a different one that it has not seen before, which serves as a final exam,” said Dr. Alterovitz. In addition, this iterative approach to data release enabled the core team to figure out how to identify high-value datasets and improve them as the project progressed.

37. Honey, Kristen, Alterovitz, Gil, and Simcox, Ed. U.S. Department of Health and Human Services, Office of the Chief Technology Officer, “Deep Dive on ‘TOP Health’: Data + Technology + Innovation for Lyme Disease,” March 19, 2019. Retrieved from <https://www.hhs.gov/cto/blog/2019/03/19/deep-dive-top-health-data-technology-innovation-lyme.html>

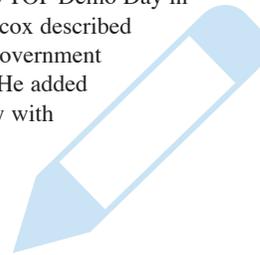
38. Participating company partners included Philips Research, Microsoft Healthcare, Oracle, and a range of small businesses such as TrialX and Flatiron Health

39. [tophealth.pif.gov](http://tophealth.pif.gov)

## EXPANDING THE SCOPE: ADAPTING THE TOP METHODOLOGY IN THE “HEALTH TECH SPRINT” (CONT.)

The AI health project was unusual in its international scope. Although international participation was not a goal of the project, the AI track found that companies from Israel and the Netherlands were interested in the challenge, and they found ways to incorporate them in the kickoff session (done virtually by video) and subsequent calls. Their experience mirrors the TOP “geo-cohort” in 2018, which included international participants from Estonia, and demonstrates that TOP’s approach of relying on virtual convenings can cross borders productively.

The results of the Health Tech Sprint agile development efforts are summarized in a January 2019 blog post, describing the problem statements, participating tech teams, and the solutions they developed.<sup>40</sup> These digital tools and platforms were demonstrated during an “AI and Open Data Innovation in Health” event at the end of February<sup>41</sup> and were showcased at the TOP Demo Day in March 2019. In announcing the results, HHS Chief Technology Officer Ed Simcox described the value of using the TOP methodology. “At HHS, we recognize that federal government alone cannot solve our most important and complex challenges,” said Simcox. He added that the Health Tech Sprint “is a valuable step in leveraging skills from industry with public resources to promote better health outcomes.”



40. Alterovitz, Gil and Honey, Kristen, U.S. Department of Health and Human Services, Office of the Chief Technology Officer, “TOP Health’ Tech Sprint Unleashes the Power of Open Data and AI,” January 17, 2019, Retrieved from <https://www.hhs.gov/cto/blog/2019/1/17/top-health-tech-sprint-unleashes-the-power-of-open-data-and-ai.html>

41. Alterovitz, Gil, Ardalán, Davar, and Honey, Kristen, “Deep Dive: How a Health Tech Sprint Pioneered an AI Ecosystem,” DigitalGov, February 27, 2019. Retrieved from <https://digital.gov/2019/02/27/how-a-health-tech-sprint-inspired-an-ai-ecosystem/>

# CONCLUSION

Only a few years after its launch, The Opportunity Project has demonstrated unique value to government agencies, their partners, and the public. As Drew Zachary, Director of The Opportunity Project, said, “The North Star for The Opportunity Project is impact—showing the success of the products developed and measuring the results.” Going into 2019, TOP has announced plans to focus on workforce development and increasing response rates for the 2020 Census, two topical areas with high potential for impact using federal open data. TOP will also host its first prize competition in collaboration with the Office of Management and Budget in summer 2019. The TOP organizers have invited the public to submit ideas for problem statements for 2019 at <https://opportunity.census.gov>.

While TOP initially encouraged teams to build new digital tools and platforms, the team has learned that digital applications using open government data can often build on existing platforms. The goal is not necessarily to build something completely new, but to increase the number of people interacting with the data and increase the data’s value.

The Opportunity Project does not only produce high-value applications: The collaborative process fostered by TOP brings federal agencies into the agile development methodology and exposes them to innovative solutions from data users across industry, nonprofits, academia, and the general public. TOP enables government agencies to think about data in different ways and supports the development of a more flexible and user-centered government workforce. Helping agencies articulate their priorities in human terms represents an important long-term outcome.

TOP also provides outside stakeholders with unique access to government data stewards, and connects data stewards with data users in a way that can help them prioritize data by user needs. Those connections can remain well beyond the end of the program and have a positive impact going forward.

The Opportunity Project has now proven out its methodology through dozens of demonstration projects since 2016. That successful track record, and the methodology TOP has developed through those projects, enabled HHS to adapt TOP’s approach and will help other government agencies to do the same.

A next step is to develop tools that will make it even easier to use TOP’s approach. The TOP team developed a toolkit to encourage more collaboration between government, private sector, nonprofit organizations, and data users. As Mara Abrams, Co-Director of Census Open Innovation Labs, noted: “TOP is about more than the tools that are created. We want it to be a model for public-private collaboration both within and outside of government.”

The Opportunity Project, and the approach it has developed, have demonstrated a range of benefits for all stakeholders. Government agencies benefit both from the work of tech teams and from the experience of participating in user-focused projects. Companies that contribute their work through tech teams have an opportunity to showcase their capabilities while learning about government data resources. And user advocates participating in TOP help ensure that their needs have priority in government data programs and resulting technologies. By adopting and adapting TOP’s approach to their own missions and programs, government agencies and their stakeholders can apply agile, collaborative solutions to a wide range of public challenges.

# GLOSSARY

## TOP Terminology

**Data Exploration**—Tech teams explore open data available to solve the problem(s) that they are tackling, and data stewards help them to find open data to use in their digital products.

**Data Stewards**— Participants in the sprint process, generally from a federal agency, who are responsible for maintaining their agency’s data assets.

**Demo Day**—An event at the end of the development cycle where tech teams publicly launch the tools and platforms that have been created using open government data.

**Minimum Viable Product (MVP)**—Basic prototype that can be used for testing and development.

**Product Advisors**—Specialists from outside of government who help the teams to ensure that the products they create continue after the sprints, so that they can reach their target end users and have real impact.

**Problem Statement**—Brief description of an issue or condition to be addressed by tech teams.

**Sprint**—Time-limited work cycle designed to address problem statements using open government data.

**Tech Teams**—Private sector companies, universities, nonprofits, and students who participate in sprints to build products that translate open data into valuable tools for people across the country. The tech teams design, own, and help to launch the products they build.

**User Advocates**—Community leaders with direct lived experience who can help tech teams design products that are realistic, useful, and solve a problem for the target end users.

**User Engagement**—Research conducted in order to understand the degree to which users find products and services interesting or useful.

**User Persona**—Detailed representation of the needs and expectations of a real-world user group, which can be used to inform the development of products and services.

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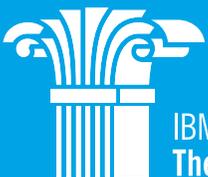
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