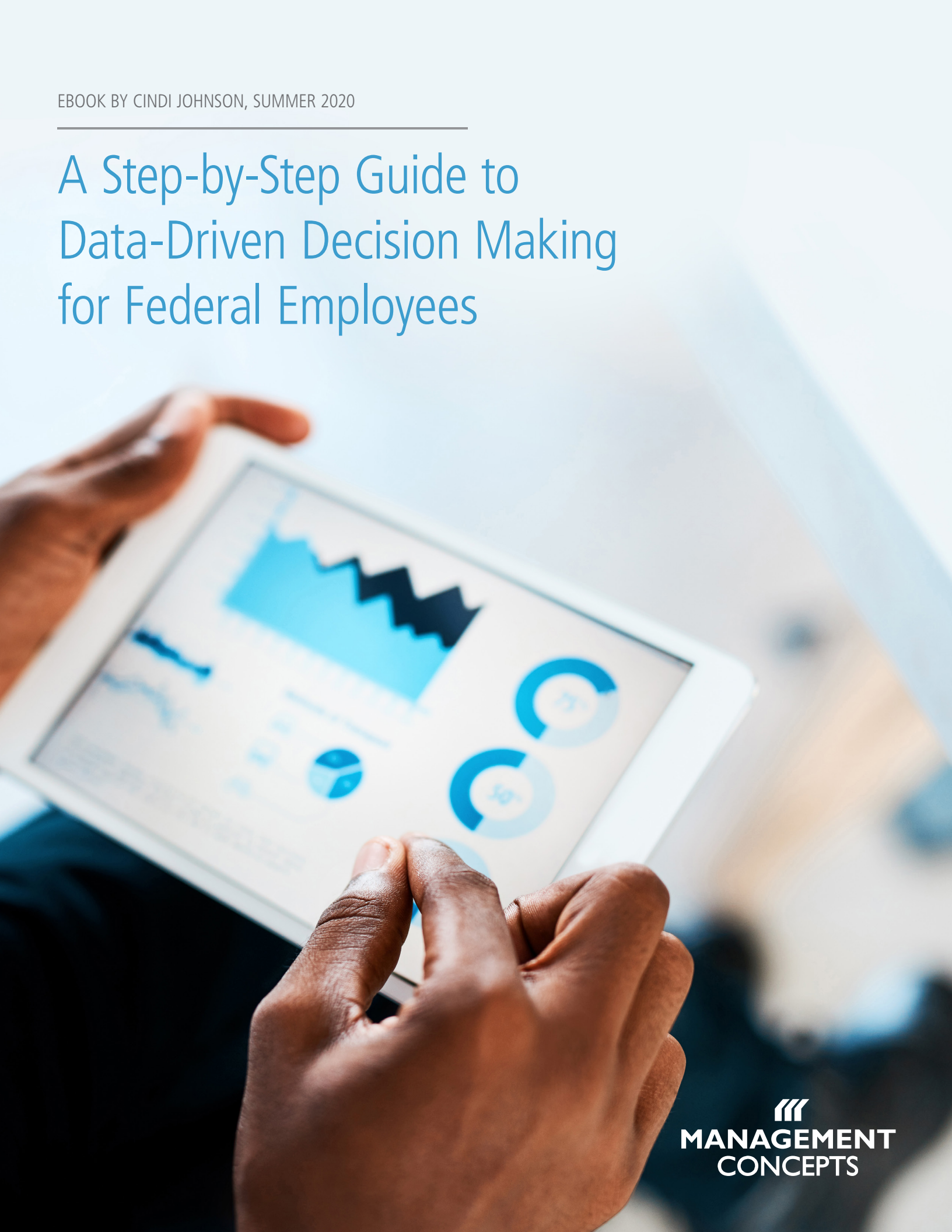
EBOOK BY CINDI JOHNSON, SUMMER 2020

A Step-by-Step Guide to Data-Driven Decision Making for Federal Employees



MANAGEMENT CONCEPTS

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Applying Data-Driven Decision Making in the Federal Government

Since the **Foundations for Evidence-Based Policymaking Act of 2018** was signed into law, prominent federal agencies have been integrating relevant data into their decision making processes, policy development, and program management. The Act also required agencies to establish Chief Data Officers (CDOs), develop and publish data standards, and advance data-related competencies throughout the federal workforce. In combination, these changes are increasing transparency, accountability, and efficiency.

Relying on data to guide our decisions is not second nature for most of us. Instead, we make decisions according to our past experiences and assumptions, and we are swayed by our interests. Dealing with statistical analyses can seem foreign and, let's face it, downright scary.

The good news is that, more often than not, stepping out of our comfort zones leads to great accomplishments. When we take the time to analyze situations carefully, we produce more consistent results. Favoring evidentiary data over emotion provides structure and discipline and is most likely to produce optimal solutions.

Why Should We Use Data to Drive Decisions?

Whether we are problem-solving for a project, designing a new program, or re-evaluating our human capital needs, it is helpful to have a reliable, proven process. This process should enable us to clearly define what we are trying to achieve, determine which parameters we must adhere to, and weigh the risks and benefits of each option to justify our solutions properly.

Taking the time to think about what exactly is needed, determine the priorities, and identify and evaluate options will reveal the following key benefits of using data and analytics for decision making:

- ***Decisions and outcomes are aligned.*** Data ties our business decisions to analytical insights, which, in turn, creates greater awareness of outcomes and performance. This enhances the consistency and effectiveness of our results.
- ***Premature actions are diminished.*** Clearly defined objectives backed by quality data and robust analytical processes allow us to examine all aspects of an issue before acting.
- ***Decision making is improved.*** A structured data-driven decision making (DDDM) process includes a decision monitoring plan that is built on meaningful metrics and periodic reviews over time and provides a feedback loop that continually improves our understanding.
- ***Critical thinking is enhanced.*** Data are neutral. Sadly, human beings are not. By adopting a methodological approach to examining and interpreting data, we create systems that adjust for bias, ignorance, and personal preference.
- ***Assertions are justified.*** Government employees must continually justify the need for funds, people, technology, and other resources. In the face of dwindling budgets, new regulations, and evolving customer expectations, developing a case with analytical evidence is increasingly necessary. Some examples include demonstrating how to reduce rework, share resources across organizations, and streamline processes — thereby increasing the likelihood of mission success.

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CASE IN POINT

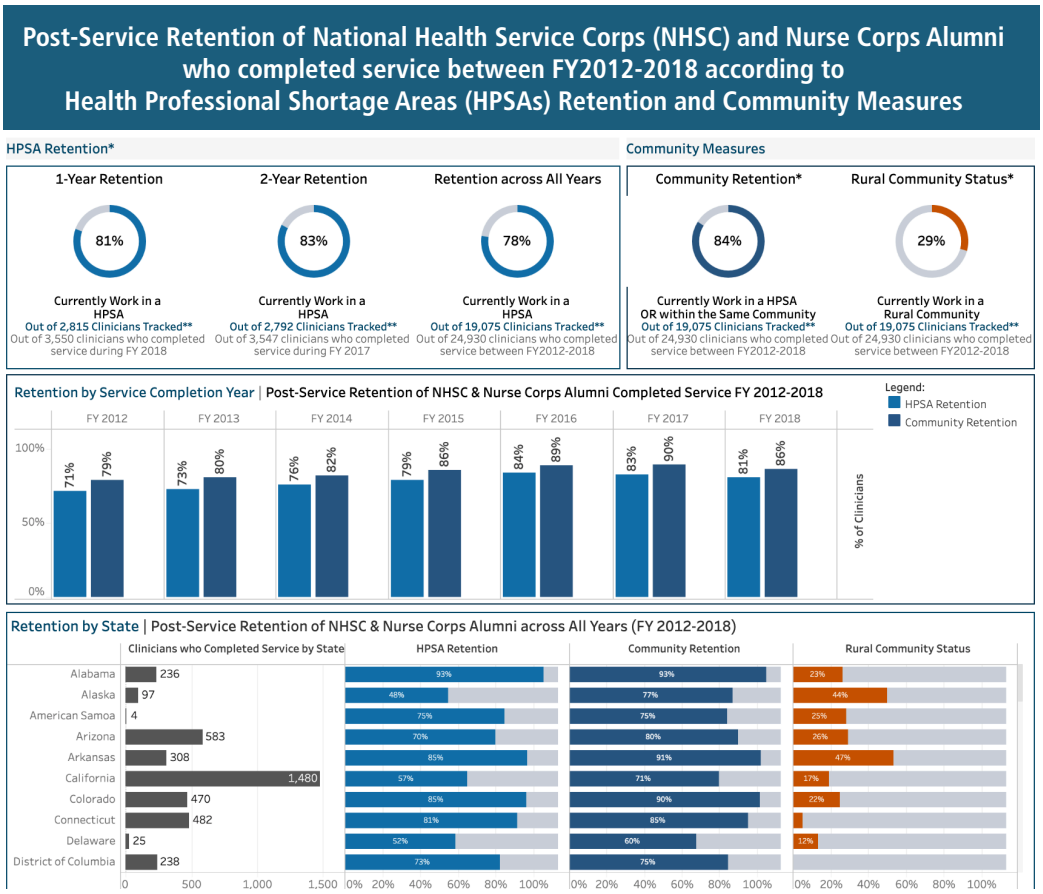
The Bureau of Health Workforce Addresses Challenges through Data-Driven Decision Making

The **Bureau of Health Workforce** (BHW) strives to strengthen the health workforce and connect skilled health care providers to communities in need. They are routinely faced with the dilemma of how to balance the needs of medically underserved regions and populations against chronic shortages of skilled healthcare workers. To find a workable balance, they turn to education and data.

In exchange for a service commitment, BHW helps develop healthcare professionals in a wide range of medical disciplines—doctors, nurses, dentists, therapists, administrators, chiropractors—and deploys them to rural or underserved populations. Each clinician's service location is determined by matching their skills and specialties against a comprehensive and complex database of medical service needs and facilities.

BHW uses its resources and data in other strategic ways. To address the cost and disruption caused by the cycling churn of clinicians in and out, BHW collects data on which clinicians continue to work with underserved populations beyond their service obligation. They do that to understand, prioritize, and manage their training and staffing, but they also use the data to learn what causes their alumni to remain. Then they leverage that knowledge to build the medical workforce in targeted communities. As of October 2019, 84% of the roughly 19,000 clinicians tracked between 2012 and 2018 were still working in underserved areas beyond their service obligations.

Finally, BHW is making its data publicly available to maximize its utility. Members of the community can see which services are available in their areas. Grant providers can determine how to distribute medical training funds based on priority needs. BHW administrators can evaluate retention information to determine how to assign staff and provide incentives for healthcare workers to serve in areas of particular need. It's fair to say that BHW has maximized the value of its data and is using it in important ways.



Source: **Bureau of Health Workforce Clinician Dashboards**

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How Can We Use Data to Drive Decisions?

Understanding the value of data-driven decision making (DDDM) is not the same as knowing how to plan and implement an effective DDDM strategy. The first rule of thumb is to keep it simple and make it scalable. We will now explore a proven step-by-step guide that will enable you to adopt DDDM in your sphere of influence.

Step 1: Define the Objective

We must begin by clearly defining the objective. Taking the time upfront to develop a comprehensive understanding will prevent wasted time and effort working on solutions that do not produce the desired result.

Just as the finish line marks the end of the marathon, a data-driven decision-making process should have success markers. Establishing prioritized success criteria is crucial to maintaining the course effectively from the initial objective to the desired result.

Identifying metrics and incremental milestones to evaluate potential solutions objectively reduces the likelihood of conflict, increases the chance of attaining optimal results, and helps us reduce the potential impact of the human factors noted earlier.

In addition, clearly defining the objective with prioritized success criteria informs the direction and level of complexity of analyses. It provides a focus for the investigative approach and greatly reduces rework and calls for last-minute changes.

Step 2: Gather the Essential Data

Before we can gather essential data, we need to determine which data will be essential, right? An analysis plan can be a half-page brief or a formal project plan depending on the complexity of the issue, the skill and experience of the team, and the common understanding of the desired result. The plan will act as a road map, defining the analyses needed and details of the data that will be used. Keep in mind, though, that this is meant to be a pencil sketch, not a framed masterpiece. Once the process has begun, you may uncover information that is pertinent to your decision and will alter your intended directions.

The following questions should be addressed in an analysis plan:

- What has triggered the need for this decision?
- What is the scope of analyses?
- What are the success criteria?
- What is the priority of the success criteria?
- What are the measurable, clear, and simple metrics that will be used?
- What are the questions we need to answer with the data?
- What data will be needed to answer these questions?
- How will the data be attained?
- How will the data be prepared for analysis?
- What analyses will be conducted on the data?
- What are the roles and responsibilities of each participant?

More often than not, your data will need to be "cleaned" before you can use it. Don't worry; there are no mud pits to crawl through, just irrelevant, incomplete, duplicated, improperly formatted, and sometimes incorrect data that needs to be processed. This can be very time consuming, but it is necessary. As your data is being cleaned, document the assumptions that are made about it, the variables used and why, and what guidelines are used to address outliers and missing data. Documenting how you clean and prepare your data increases the reliability of your analyses so that your results can be built upon in future endeavors.

Step 3: Analyze the Data

Once the analysis plan has been drafted, and the data has been gathered and prepared, it's time to analyze. This process consists of four distinct phases, (1) Analyze – using revealed trends to predict an array of possible future conditions, (2) Evaluate – reflect on the implications of the data concerning the objective, (3) Ideate – brainstorm possible recommendations, and (4) Recommend – prepare an optimal recommendation that meets the objective and is supported by the data analyses.

ANALYZE

Once you've drafted an analysis plan, the next step is execution. Your data will likely reveal historical insights related to trends, events, and past performance. These insights may enable you to make short-term predictions with some level of confidence. Also, predictive, prescriptive, or algorithm-based models can be applied to more complex questions and variables.

EVALUATE

Once you've got your results, the next step is to put them into perspective. Focus on your clearly defined objective and any relevant regulations or standards. How do your findings stack up against anticipated results? Do they coincide or clash with leadership's expectations? Do the findings support or contradict one another? Document your thoughts and conclusions while keeping in mind that you will later be providing this evidence to your stakeholders.

IDEATE

Turning brainstormed ideas into recommendations is a creative process. While this may be fun for some, it will be challenging for others. We will use what we have learned from the data analyses to brainstorm potential recommendations that could lead to achieving our objective. For the best results, include as many perspectives in the brainstorming session as you can — subject matter experts, stakeholders, operators, seasoned professionals, and entry-level users. The more diversity you can achieve, the greater your potential for success will be.

Be sure that all participants understand that no idea is off-limits. Leverage the expertise of your team, create intrigue, and use facilitation techniques to get as many suggestions as possible. And don't give up too soon! One of these ideas could become the next great government success story.

RECOMMEND

It is best to start with the objective description and the prioritized success criteria, including metrics and incremental milestones that we developed at the start. Use these "rules" to evaluate ideas.

An intuitive method for this type of evaluation is a simple matrix where the criteria are listed on one axis, and the options are listed on the other. Prioritization may be indicated with weighted ranking like the example below where different types of pets are ranked by desired qualities and weighted by priority to determine the least to most suitable. Use the matrix to evaluate all of the options. There are, of course, other methods of evaluation. Choose the one that works best for you and your team. Ultimately, you will want to craft at least one recommendation that you consider to be optimal and 2-3 secondary recommendations.

Pet Suitability

1-5 = Least to Most

	Friendly		Easy		Quiet		Inexpensive		Weighted Total
Weight		x4		x3		x2		x1	
Dog	4	16	1	3	1	2	3	3	24
Bird	3	12	2	6	3	6	3	3	27
Fish	1	4	4	12	5	10	4	4	30
Cat	3	12	3	9	3	6	4	4	31

Step 4:
Act on the Insights

Now that you have closely examined the data, analyzed the possibilities, and selected a few winning recommendations, it's time to act. Now comes the question, who will be the ultimate decision-maker?

You – If the decision is yours, you now have adequate information to guide your decision, fully backed by data. For understanding and consistency, it is best to document the decision and all of the related facts so that it can be clearly understood, implemented, monitored, and revised according to future needs.

Your supervisor – You will likely be discussing your preliminary results throughout the process with your supervisor to keep them informed of your team's progress. Depending on the scope of the decision, they may ask you to prepare a formal presentation that will be communicated within the organization, and potentially beyond. If the decision does not require this level of detail, document your process, decisions made along the way, and related facts and compliance issues so that your recommendations can be clearly understood, implemented, and monitored by your supervisor and others on your team.

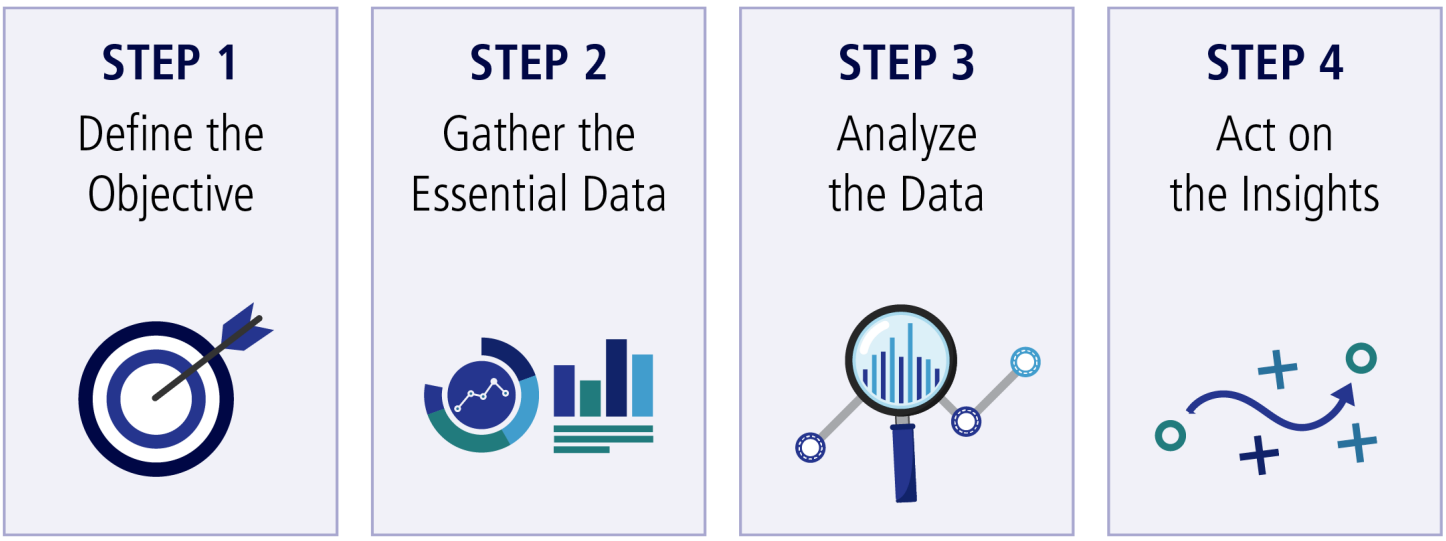
Other stakeholders – If the recommendations that your data analyses support will be shared with anyone other than your team or your supervisor, you will need to produce formal documentation that should include the entire process and answer the following questions:

- What triggered the need for this decision to be made?
- What is the clear objective that you aim to achieve?
- What insights did your data analyses reveal?
- How will the outcome of this decision impact the decision-maker(s)?

Every decision-maker – Recommendations for implementation safeguard the rollout of the plan and form the structure of the monitor-evaluate-adapt process that follows. The implementation plan should address the following questions:

- How should the preferred recommendation be implemented, if accepted?
- Who will be responsible for the implementation?
- Who will be responsible for monitoring, evaluation, and adaptations?

After the preferred solution has been implemented, the final step in DDDM is to monitor the results and see how they perform regarding the success criteria that were established during the initial objective evaluation. Whenever possible, it is helpful for the team who developed the solution to remain in contact with the implementation team to assist with troubleshooting and make adaptations as needs change.



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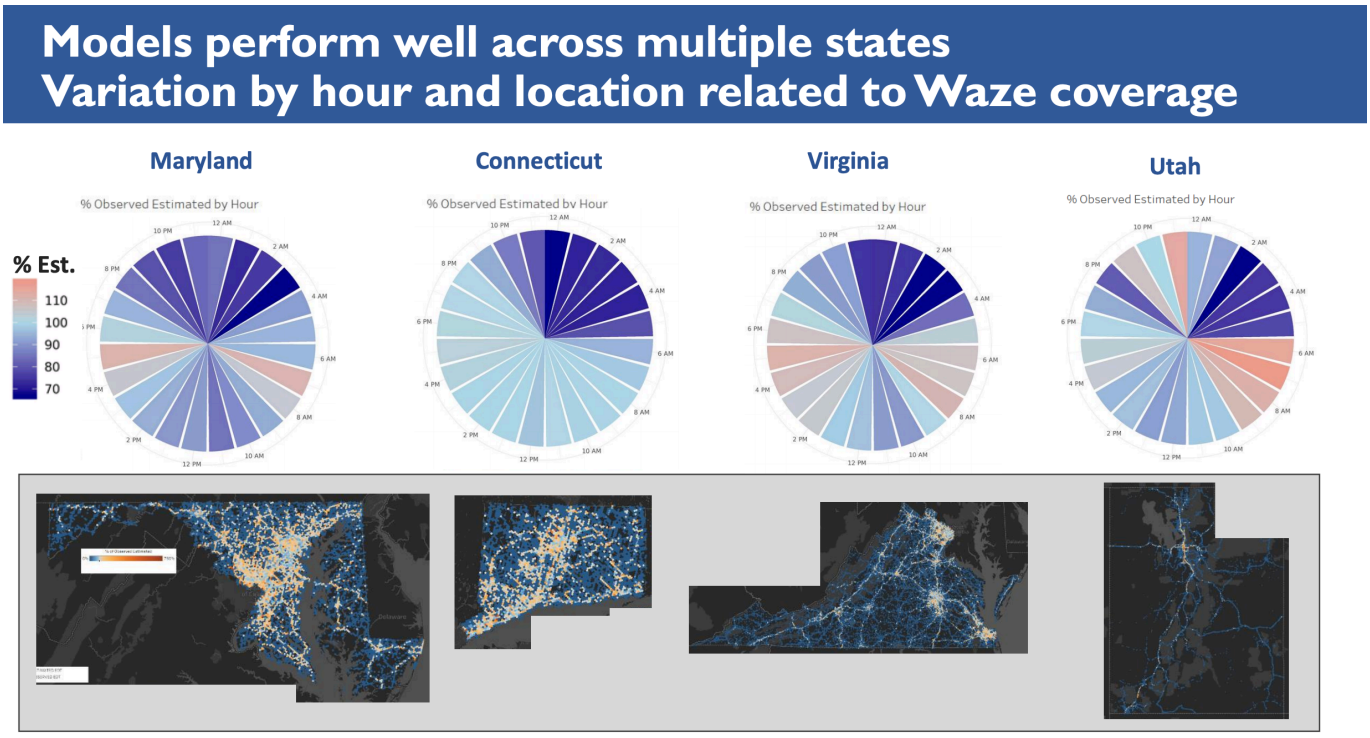
CASE IN POINT

Data-Driving Decision Making at the Department of Transportation

The Department of Transportation (DOT) **Safety Data Initiative** (SDI) was developed to explore ways to leverage big data better to understand crash risk and the potential for mitigation. Among its objectives, DOT hoped to use this data to build its capacity to perform data analyses for policy and decision making based on risk and predictive insights and promote the innovative use of safety data and visualization for continuous safety improvement.

One of the initiatives DOT is exploring to improve safety is a **collaboration with Waze**. DOT's Volpe National Transportation Systems Center (AKA the Volpe Center) is leading a pilot project that explores the opportunity to estimate police-reported traffic crashes in near real-time. They combine crowdsourced crash data from Waze with crash data provided by the State of Maryland via the National Highway Traffic Safety Administration's (NHTSA) Electronic Data Transfer pilot. The Volpe Center employed machine learning techniques with these datasets to train statistical models to predict crashes. In this pilot, DOT learned these models supported with Waze data produce reasonably good estimates of police-reported crashes. This pilot has laid the foundation needed for a future nationwide scale-up of a crash count tool.



Source: Department of Transportation Volpe Center

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Conclusion

The DDDM Process Is Seldom Linear

While DDDM has a general rhythm and flow to it, it is very seldom linear in practice. The discovery of new information could take us back to revisit our objective and change our success criteria. Or, we may be simultaneously developing data while interpreting preliminary results from another part of the analyses.

The federal government has signaled its commitment to rolling out DDDM across the federal space in extraordinary ways.

- In 2015, the General Services Administration (GSA) rolled out its **Data-to-Decision** (D2D) platform. This initiative is designed to provide a uniform service available to all government agencies that will help them collect, clean, access, and share their data. Associated with this initiative is the development of new guidelines and tools to support agencies as they develop more robust and intentional DDDM practices.
- In 2018, Congress passed a law that will institutionalize data governance, cause infrastructures to be built to support comprehensive data usage in the decision and policymaking activities, and build deep competencies around data analytics across the government.
- In September 2019, Performance.gov announced three grand prize winners, each the recipient of a $300,000 **Gears of Government Award**, which brings together experts in multiple disciplines to produce a creative, data-driven, and interdisciplinary approach to enable citizens and government to interact in new ways.

You don't have to be a data engineer, statistician, or business analyst to make an impact on the quality of decisions that you make or that come out from your office. You can start by simply finding ways to define objectives, gather and analyze data, and act on the resulting insights.

As your discipline in these areas increases, you may find yourself using this process to help you balance priorities against a limited resource set as the **Bureau of Health Workforce** routinely does. Or you may find that you are faced with exploring solutions that have the potential to improve the lives of whole populations, as the Department of Transportation's (DOT's) Waze pilot is doing.

In either situation, DDDM can make it possible to achieve extraordinary results.

ABOUT THE AUTHOR

Cindi Johnson, MBA, is president of Thrive Development LLC and an instructor at Management Concepts. For more than 25 years, she has helped organizations establish strategies, policies, and programs that help businesses build agility and simplicity into their leadership teams and workforces. Cindi earned a bachelor's degree in business administration from Strayer University and an MBA in organizational & human resource development at the University of Mary Washington. In addition, she holds several professional certifications.

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