

Driving Data Literacy in the Public Sector



Table of Contents

Preface	3
The public sector's digital revolution	4
Data in context	5
How data literacy helps public sector organizations	8
How Coursera can help achieve your organization's data literacy skills development goals	14
Conclusion: Empowering the future of government work	20
Endnotes	22

Preface: Supporting Data Literacy With Skills-based Learning

From the smallest unit of local government to international organizations, public sector agencies around the world are undergoing digital transformations that leverage new technologies to carry out core functions. This evolution demands new skills and knowledge, chief among them data literacy.

Data literacy is the capacity to read, interpret, communicate, and reason with data.[•] Data literacy is a command of data *in context*, involving a grasp of where and through what methods data is sourced, how data is analyzed, how it can be applied to real-world use cases, and what practical value it may realize. Data literacy skills enable governments to analyze bottlenecks that may be slowing down constituents' abilities to access key services and then modernize these experiences.

Economic and environmental conditions, resource flows, and individual behaviors are all cataloged as data points within complex databases. It's essential for leaders to equip their teams with the digital language skills necessary to navigate, act, and thrive in a world of data. At Coursera, we are committed to providing and expanding access to industry-leading training across a wide range of critical skills, including data literacy.

Coursera has partnered with over 200 government agencies around the world, including the Abu Dhabi School of Government (ADSG) in the United Arab Emirates, Central Bank of Brazil, the European Patent Office, the Philippines Department of Science and Technology (DOST), and the Defense Acquisition University (DAU) in the United States, to empower their learners with the critical skills to shape policy, and to deliver more effective services to citizens.

These learning efforts have produced tangible results: 60,000 government employees trained in data science, artificial intelligence, leadership, and digital transformation in Abu Dhabi; a more resilient public infrastructure in the Philippines; heightened digital sophistication through data literacy for the Department of Defense.

These examples are just the beginning of how Coursera has helped governments around the world transform their workforces. If you're interested in learning more, please visit <u>https://www.coursera.org/</u> <u>government</u> and discover how Coursera can help support your organization's skills training needs.



Kevin Mills, Vice President, Coursera for Government

'Data literacy is a component of broader digital literacy. Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy, and media literacy.

The Public Sector's Digital Revolution

Governments consistently need cutting-edge technologies to serve constituents and rely on public sector employees with the skills to put them to use. As digital transformation initiatives develop, so too does the demand for skilled workers who can manage, interpret, and communicate data. Public sector leaders in technology or learning and development are increasingly expected to drive data literacy for growing numbers of employees across increasingly diverse departments and functions.

Informing evidence-based policymaking. Increasing efficiency for logistics and record management. Improving equitable access to government-collected information. Saving taxpayer money while better serving people. The impact of data literacy is clear: State-of-the-art governance can only be achieved with the ability to think and act with data.

Take for instance Estonia, which ranked first among European Union nations in Digital Public Services in 2021. Estonia faced an economic and logistics conundrum. With a population of only 1.3 million and scant natural resources, how could it afford to efficiently and reliably administer a nation? By implementing a digital-first model, officials were able to cut costs and hassles for government workers and citizens alike. Personal identification was made digital, with 99% of the population using an electronic ID. Vital services like medical prescriptions are issued almost entirely online. Queuing at a government office has been all but eliminated, with 99% of government services being offered digitally. Driving this transformation was a multitude of upskilled and reskilled government employees equipped to collect, interpret, and leverage data to achieve practical results.¹

This is just one example in a growing number of national government entities pursuing digital futures. Propelling these transformations forward is a growing movement toward digital upskilling and data literacy. Data literacy is the secret sauce.

In this e-book, we'll explore:

- Why data literacy is vital for improving government services
- How to launch, support, and show the ROI of a data literacy skills development program
- How Coursera can help support data literacy skills development within your organization

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Data in context

The World Bank defines data literacy as an individual's capacity to find, access, read, work with, and analyze data to responsibly inform decisions. Government employees who practice data literacy would be able to design better policy and service solutions as they have the capacity to read, interpret, communicate, and argue with data. More critically, governments that sustain a culture demanding the use of data and leverage insights in their decision-making will realize the strategic value of being data literate.²

This may seem like a significant departure from the stereotypical image of public sector work: tried and true, conservative, and sometimes bureaucratic. But governments have always needed to incorporate emerging technology to serve people better, whether with mainframes, geospatial modeling, or artificial intelligence. It's no accident that the word *statistics* originally referred to the data collected by a state.³ What changes is the particular technology and the skills that employees need to have to master these innovations. Data skills are the most recent turn of the cycle. No longer residing solely with technical specialists, every government employee needs a baseline level of data literacy.

For many, data literacy can seem like a daunting topic. According to The Data Literacy Project, 74% of employees feel overwhelmed or unhappy when working with data, despite 87% of employees seeing data as an asset. Yet only 37% believe data literacy training would make them more productive.⁴ Disrupting these preconceived notions and inspiring enthusiasm for data literacy should be at the crux of public sector learning initiatives. Your objective? A data-first government in which:

- Every government employee can ask data-informed questions, find the data they need, interpret the data to discover answers, and communicate their findings to colleagues and broader teams.
- Leaders can make data-driven decisions. Local municipalities can use
 birth rate projections to rezone school districts. City planners can prioritize
 infrastructure improvements based on traffic patterns to improve road safety.
 State communications teams can use census data to ensure their messaging
 is accessible across representative languages.
- Technical teams have more advanced data skills, including the ability to use data to improve processes, harness innovative technologies like machine learning and programming, and ultimately affect organizational change that creates a more efficient government and satisfied constituents.

CASE STUDY How the DAU Is Driving Digital Upskilling With Coursera

The Department of Defense's Defense Acquisition University (DAU) equips military and federal civilian and contractor learners with applied technology and logistics training. As matters of public and private interest are increasingly transmitted through digital channels, security professionals must take a similarly sophisticated approach to defense.

Coursera's partnership with the Defense Acquisition University (DAU) began after the United States Congress charged it with creating a pilot program for agile software development. Rather than creating its own content, the DAU turned to Coursera to deliver high-quality training at scale. Following the success of the pilot, DAU continues to partner with Coursera while expanding its mandate to bolster the Department of Defense's data literacy; through Coursera, DAU students can now access a wide range of training in agile software development, digital engineering, and data analytics.

A data-first government

1 Technical teams have cutting-edge skills

- Data engineers can automate data flows and enable other team members to better use data
- Data analysts can build advanced models and reports to be leveraged by other team members
- Data scientists can interpret and analyze complex data

2 Functional teams are data-driven

- Leaders make data-driven decisions
- Program managers can interpret data to drive innovative initiatives
- Policymakers can shape data-driven policies

3 Everyone is data literate

- Know how to ask the right questions
- Understand how to find data they need
- Can interpret data and communicate with it



There are many skills required by the workforce today. But a prerequisite is to make a cultural change. Promoting data literacy across the workforce and trying to find out what data literacy means and what skills are needed to demonstrate it, that's something I've wrestled with and it's something I try to build out in training products for the workforce."

David Pearson, Center Director for
 Engineering and Technology, Defense
 Acquisition University

How data literacy helps public sector organizations

From cities to international governments, governmental bodies leverage data literacy skills to streamline their processes, grow their economies, and improve the lives of their citizens. Investing in data literacy can result in outcomes that can be summarized as the four E's: Effectiveness, Efficiency, and Equity for services to citizens, and Employee Value Proposition for public sector jobs.

Effectiveness

To stay in step with an increasingly complex world, public sector organizations are turning to data literacy training to upskill employees and revolutionize vital functions.

In 2020, the United States Office of Management and Budget inaugurated the federal Data Science Training Program. This initiative provided 61 federal employees representing 20 agencies with 18 weeks of online courses in programming, statistics, data management, and data visualization.⁵ Upon graduation, the participants brought their newfound data literacy to improve outcomes in key service areas, including agriculture, commerce, defense, and education.⁶ And this momentum doesn't stop with operations. The federal government in the U.S. is embracing data literacy skills as part of its commitment to evidence-based policymaking. In 2021, the Biden administration released guidance to federal agencies that pointed out that "the collection, curation, governance, protection, and transparency of data [are] essential for evidence-building."⁷ The Federal Chief Data Officer Council has taken up this call, working across federal agencies to improve data competence, surface actionable insights, and ultimately make public services more impactful, efficient, and equitable.⁸

Governments around the world recognize the need to collect and leverage data specific to their own context. For instance, the Sudan Evidence Base Programme (EBP) has also embraced data-driven policymaking. A collaboration between Sudan's Ministry of Finance and Economic Planning, the U.K.'s Department for International Development, and World Bank, the EBP trains government workers using Sudan-specific data to improve government capacity to apply critical data analysis to tackle national concerns.⁹

Efficiency

Greater data literacy can improve the efficiency of public sector organizations, which can in turn result in overall cost savings for taxpayers. For example, the United States city of Denver, Colorado, launched a data academy in 2011 to train city workers.¹⁰ Innovations included reducing recruiting time for city positions from 85 days to 42 days to fill, reducing closure rates for public health complaints by 59%, and reducing the number of planning and development permits backlogged from 100 to four.¹¹ Thus far, this program has saved the city a total of \$51 million in both hard-dollar budget items and soft-dollar efficiency.¹² In San Francisco, a similar program has saved the local government nearly \$11 million over the last decade.¹³

Leveraging data to improve efficiency has been especially important for countries with sophisticated public sectors managing services across broad geographical territories and complex social needs. This was in part the impetus for the aforementioned Estonian plan to move to a digital-focused government: a relatively small number of upskilled and reskilled government employees highly conversant in data and digital applications managing 99% of government services online. ¹⁴



Equity

Working with data presents many of the same challenges as any other government project: Who is included and excluded? Who benefits and who pays? Whose stories are being told? By improving data literacy skills, governments can improve equity outcomes. Indeed, the international Organisation for Economic Co-operation and Development (OECD) includes "data-driven" and "open by default" as two of the six dimensions driving the future of digital government and policy.¹⁵ Likewise, the European Commission's Government 2021 cited "transparency" as one of our four top-level benchmarks for evaluating the maturity of a government in how it delivers digital public services.¹⁶ Government employees have the opportunity — and, increasingly, the mandate — to develop data skills that open governments rather than obfuscate, and that empower citizens with actionable insights.

One promising example is Kenya's PesaYetu website, created by Code for Africa in partnership with Kenya Community Media Network, Catholic Media Council, and the German Cooperation. The website serves as a data tool for journalists, activists, and researchers in Kenya to collect, analyze, and visualize census and budget data to hold government officials accountable for their promises. With an interactive map of data by county, data sets, search features, and data-driven stories, PesaYetu serves as a powerful platform that empowers citizens to take control of policymaking and governance.¹⁷

In an effort to improve equitable support for underserved communities, the United States federal government has recommended disaggregating data. Disaggregated data retains key demographic identifiers, including gender, age, race, ethnicity, disability, and veteran status. By adding this context, government agencies can more precisely analyze what interventions are working and for whom.¹⁸ Equipping government workers to manage and parse this complex data will ultimately improve access to vital services for the citizens and communities that need them most.



Employee value proposition

Additionally, data-related skills training can help create an employee value proposition and make public sector jobs more attractive. In one survey, almost 50% of workers would consider switching jobs for better training and upskilling opportunities, and more than 60% said it was an important reason to stay at their current job.¹⁹ Hiring and retaining employees for public sector jobs can be difficult, as pay can lag behind the private sector. That's especially true for data science roles. For example, the median yearly salaries for data science jobs in the United States are \$30,000 higher in the private sector than in government service.²⁰ (That does not include the signing bonuses, stock options, and other financial incentives private industries have at their disposal to recruit talent.) With many recent graduates relying on student loans to pay their way through college, a higher salary and additional compensation offer them better opportunities to pay off debts faster. Many workers, especially younger ones, seek jobs that will provide them with new skills.



Data literacy in action

Public sector organizations worldwide are embracing data literacy skills to carry out innovative and important projects. Here are additional examples of how data literacy can drive Efficiency, Effectiveness, Equity, and Employee Value Proposition for public sector organizations as part of larger digital transformation programs.

Data Literacy in Action - Global Overview



- 1 Brazil's government has saved a reported \$92.5 million following an effort between 2019 and 2021 to digitize 1,116 government services²¹ and is investing in data literacy training for public sector employees and citizens.²²
- 2 The **Canada** School of Public Service created a Digital Academy to teach Canada's public servants data literacy skills and create a common language around data among government employees.²³
- **3 Nigeria** analyzed data from households, water points, water schemes, and public facilities, including schools, to increase water access throughout the country.²⁴
- 4 In the UAE, the Abu Dhabi School of Government partnered with Coursera to provide more than 60,000 government employees to prepare government employees and their agencies for the changing world of public and private sector work.*
- 5 To help employees keep up to date with emerging technologies, the Philippines Department of Science and Technology (DOST) partnered with Coursera to advance public sector knowledge.*

- **6** Key to government services digitization in **Estonia** was the training of government employees in the collection, interpretation, and leveraging of data to drive practical results.²⁵
- 7 In the United States, the Defense Acquisition University partners with Coursera to bolster the Department of Defense's data literacy alongside other key areas of digital transformation.*
- 8 The **Sudan** Evidence Base Programme (EBP) mandates the training of government workers using Sudan-specific data to drive data-driven policy decisions.²⁶
- **9 Kenya's** PesaYetu website provides citizens a powerful platform for understanding and providing oversight for government policy.²⁷
- **10 Portugal** launched the 2022 Action Plan for Digital Transition with the goal of accelerating Portugal's digital transformation, expanding digital inclusion by improving online infrastructure, and ensuring data literacy for government employees and citizens alike.²⁸

Denotes a Coursera Partnership.

Data Literacy in Action — a Closer Look

Philippines

As part of its response to the COVID-19 pandemic, the government of the Philippines turned to Coursera for Workforce Recovery (C4WR) to equip 75,000 learners with the skills needed to find new employment or grow in the current opportunities. Seeing this success, the Philippines Department of Science and Technology (DOST) adopted Coursera as their employee training program for keeping employees up to date with emerging technologies. By implementing Coursera, DOST teams have advanced their knowledge in subjects such as artificial intelligence (AI), machine learning (ML), and the internet of things (IoT). Participants completed 30,140 courses, the majority in information technology, computer science, and health. The most popular courses included a course on time management and productivity, one on Excel skills, and a course on managing biometric data to support COVID-19 tracing.²⁹

The United Arab Emirates

Established in 2018, the Abu Dhabi School of Government oversees and plans learning and development for all Abu Dhabi government employees. Coursera partnered with ADSG to provide more than 60,000 government employees with access to 3,600 online courses to develop skills in data science, artificial intelligence, leadership, and digital transformation. This training is intended to prepare government employees and their agencies for the changing world of public and private sector work and to position these agencies as the vanguard in upskilling and reskilling private sector workers for future labor demands and opportunities.³⁰

We seek to empower government employees to be curious, knowledge-seeking learners that understand how to interpret the data available to them and build the necessary skills in their sector. Together with Coursera, we identified courses tailored to the context and needs of the Abu Dhabi government. Our partnership has also provided us with access to a vast library of courses that develop the most in-demand skills for the future."

- Her Excellency Alia Abdulla Al Mazrouei, Former Acting Director-General of the Abu Dhabi School of Government

With Coursera, our learners gain entirely new skills by studying the same industry-best content available to people in the U.S. and Europe. The richness of Coursera offerings makes it possible for someone to jump from rice farming to data analytics, because career development is readily available to them."

- Noel Ajoc, Regional Director, Caraga Region, Philippines DOST

How Coursera can help achieve your organization's data literacy skills

The world of public sector work is changing, and public sector workers need to change with it. It's critical to rapidly equip public sector employees with data literacy skills to manage emerging technologies such as machine learning, automation, and robotics. It's also important to reskill those employees at risk of being displaced by these same innovations. Coursera's out-of-the-box upskilling and reskilling solutions are a ready answer to this challenge. To launch, support, and validate a data literacy program, we recommend four steps: Plan, Curate, Engage, and Measure.

In this section, we'll explore how to develop and launch a data literacy program, as well as highlight how Coursera's Solutions Consulting team can help realize your organization's data literacy aspirations through LevelSets, SkillSets, and Data & Analytics Academy.

Plan	Curate	Engage	Measure
Determine ownership	Access trusted content	Secure executive sponsorship	Determine the metrics that matter
Assess skill levels	Map skills needs to content	Promote inclusion	Monitor learning performance
Identify your skills of tomorrow		Create a communication plan	
Create a skills plan		Experiment with learning routines	
		Facilitate a learning community	

Plan: Link Goals to Skills

Public sector organizations often have a "shopping list" of skills they'd like to train workers for, but don't always have a strategy for how to use those skills. To get the most out of data literacy skills training, organizations should connect skills development programs with their larger digital transformation goals and think about how the skills will be utilized. A recent report from Deloitte noted: "Being explicit in what problems are being solved for, as well as the needs and drivers to be addressed with a data literacy program or capacity, are vital to mitigate false starts."³¹

Questions to ask when planning your data literacy program include:

- Why are you launching this skills program?
- Who will own the program? What makes them best equipped to take ownership?
- Who are the learners? What skills do they currently possess? How would they utilize the new skills learned?
- Based on your organization's projected future, what skills should they learn? What proficiency level should they achieve?
- What road map will allow you to get your organization and its employees from where they are to where they need/want to be?
- How will you measure success?

Coursera LevelSets

LevelSets are short assessments that calibrate content recommendations to existing skill levels. After taking a LevelSet, learners receive targeted content recommendations. Managers can also use LevelSets for data on employees' skills proficiency levels, including completion rates, average scores, and the popularity of different skill areas.

Curate: Link Skills to Learners

Once you know the strategic intent of your data literacy program, you can connect learners to courses that teach them the right skills. Some common skills include data analysis, probability and statistics, and data visualization. Whatever skills your organization focuses on, a customized data literacy training program offers real-life applications, ensuring that learners understand how to apply new skills to their jobs.

SkillSets are role-based learning programs. With SkillSets, your learners can receive personalized content recommendations calibrated to their proficiency level. These data-driven course recommendations are based on insights gleaned from millions of learners who leverage the Coursera platform. Each SkillSets program aligns with a specific role and includes target proficiencies for the skills required, allowing learners and administrators to track progress against those skill development goals. To drive a holistic public sector transformation, SkillSets are bundled into Academies that transform teams with high-impact skills. One such academy is the <u>Data & Analytics Academy</u>, which accelerates digital transformation with comprehensive data literacy initiatives for everyone. The Data & Analytics Academy offers expert-level training in machine learning, artificial intelligence, and other emerging fields. For further career development, some programs have aligned courses that provide credit toward degrees offered on Coursera or through local universities.

For example, participants in the free online training initiative The American Dream Academy, launched in partnership between Coursera and the Milken Center for Advancing the American Dream (MCAAD), are able to apply professional certificates from IBM, Google, and Meta toward degree programs at Western Governors University and the University of North Texas.³²



A Sample Curation for Data Literacy

Coursera's Solutions Consulting team partners with each of our customers to provide skills development solutions that are the right fit for an organization's goals. Below you can find a sample curation of courses for establishing foundational data literacy in the public sector.

Objective	Selected Courses	Educational Partner
Understanding the power of data	<u> Data – What It Is, What We Can Do With It</u>	Johns Hopkins University
	Foundations: Data, Data, Everywhere	Google
Building fundamentals	Data Science Math Skills	Duke University
	Introduction to Data Analytics	IBM Skills Network
Building proficiency in tools for data analysis	Everyday Excel Specialization	University of Colorado Boulder
	Python for Everybody Specialization	University of Michigan
	<u>Fundamentals of Data Analytics in the Public</u> <u>Sector With R</u>	University of Michigan
Applying data analytics	Assisting Public Sector Decision-makers With Policy Analysis	University of Michigan
	Basic Data Descriptors, Statistical Distributions, and Application to Business Decisions	Rice University
Communicating data	Share Data Through the Art of Visualization	Google
	Storytelling With Data	Coursera Project Network
Ethical Use of Data	Promote the Ethical Use of Data-driven Technologies	CertNexus
Transversal Skills for Success	Effective Problem-solving and Decision-making	University of California Irvine

Engage: Link Learners to Education

Keeping public sector employees engaged with skills training not only facilitates organizational development but also career development.³³

Here are a few easy ways to ensure learner engagement and realize successful program outcomes:





Measure: Link Education to Outcomes

Public sector organizations need to measure how employees are putting their newly developed data skills into use, not only to justify training investment and prove ROI to executive stakeholders but also to measure utilization and determine if more effort needs to be put into driving engagement. Consider the health of your program across three major categories: engagement, proficiency, and outcomes.

Engagement

How engaged learners are with your program. Measurements can include:

- Number of enrollments
- Learning hours
- Assessments taken
- Course completion rates
- Learner survey
- Net Promoter Score and employee pulse survey
- Course feedback and ratings

Proficiency

How successful your learners are in meeting skills proficiency targets. Measurements can include:

- Skills proficiency
- Skills mastery
- Time to proficiency
- Industry benchmarking
- Skills progress over time

Outcomes

How successful are the public sector's goals for the designed learning program? Measurements can include:

- Innovation
- Growth
- Cost reduction
- Learner satisfaction
- Talent acquisition and retention
- Employee performance and engagement
- Diversity, inclusion, and belonging

How Coursera Helps You Measure the Success of Your Learning Programs

Coursera's Skills Dashboards allow you to track employee development across over 117 business, technology, and data science skills. This tool makes powerful analytics accessible to key stakeholders, including skill distribution, competency levels, learner engagement and effort, and industry benchmarks.

Empowering the future of government work

To keep pace, to improve efficiency and effectiveness, and to ultimately better serve the public, public sector organizations need to equip themselves with data literacy skills.

While the future holds promise for beleaguered budgets and underserved populations, transforming the landscape of public sector skills to be more data-driven comes with many challenges. Gaining program traction, engaging professional learners, and bringing constituents on board can stymie even the most promising initiative.

But the outcome is worth the effort. We've shared how governments like Estonia, the United Arab Emirates, Brazil, and the United States are leveraging data literacy to make powerful impacts in government services, effective education, and equitable access to resources. In each case, upskilling government employees is key. But to truly drive outcomes with data-driven policy, governments need to engender data literacy across the populations that they serve.

Take for instance Portugal, which has made many gains in digitization but is still lagging behind in how its citizens are able to take advantage of digitized government services. Under the Administrative Modernization Agency, the Portuguese government is carrying out a "Portugal Digital" plan. Among the goals of this initiative are the digitization of the 25 public services most used by citizens and enterprises, the creation of an e-residency platform, and improved digital education in all parts of society.³⁵ However, the government is still struggling with the national penetration of digital government services, in large part because of the lack of necessary skills to implement the transformation. The 2022 Action Plan for Digital Transition aims to accelerate Portugal's digital transformation, expand digital inclusion by improving online infrastructure, and ensure data literacy for government employees and citizens alike. ³⁶

Portugal's story provides a clear takeaway for the public sector: Without increasing the level of data literacy that public sector employees — and citizens — have, the benefits of digital transformations will remain limited.

Governments looking to transform their digital presence and impact aren't in it alone. Coursera is impacting how public sector organizations drive data literacy programs, providing out-of-the box, readily accessible upskilling and reskilling solutions, and equipping leaders with the analytical tools and insights they need to drive engagement and outcomes.

Improve decision-making and increase efficiency with Coursera's Data & Analytics Academy

Build data literacy for everyone and critical data skills for every team — and reskill people for in-demand roles. The Data & Analytics Academy from Coursera is the total skill development solution for tomorrow's data-driven companies.

Learn more about Data & Analytics Academy and speak with one of our skills transformation consultants today.

Learn more

 Coursera's inherent speed and scalability helped us facilitate a complex transition to blended learning, and it's a prime example of the value a third-party partner can provide."

-Frank Kelley, Vice President, Defense Acquisition University (DAU)

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Driving Data Literacy in the Public Sector

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