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Office of Personnel Management (OPM)

Human Resources Line of Business (HRLOB)

Upskilling the Federal Workforce: Generic Competency Development Areas and Training Resources

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Contents

[Data Science 3](#_Toc136812195)

[Development of Data Visualization Products 4](#_Toc136812196)

[Predictive analytics 4](#_Toc136812197)

[Fundamentals of AI 5](#_Toc136812198)

[ChatGPT for Problem Solving 6](#_Toc136812199)

[Data catalogs, data governance, data stewardship 6](#_Toc136812200)

[Cybersecurity 7](#_Toc136812201)

[Data Analytics 8](#_Toc136812202)

[Agile Development 8](#_Toc136812203)

[Cloud Computing 9](#_Toc136812204)

Data Science

## Competency development areas in data science

* Foundations for Data Science:
  + Understanding the role of data science in extracting insights from data and making data-driven decisions.
  + Python Foundations (Libraries: Pandas, NumPy, Arrays and Matrix handling, visualization)
  + Statistics Foundations: Basic/Descriptive Statistics, Distributions (Binomial, Poisson, etc.), Bayes, Inferential Statistics.
  + Exploratory Data Analysis (EDA).
* Data science lifecycle:
  + Data Collection and Cleaning: The basics of data collection, data sources, and data formats; techniques for cleaning and preprocessing data to ensure data quality.
  + Exploratory Data Analysis (EDA): Exploring and visualizing data to understand its characteristics, identify patterns, and detect anomalies. Descriptive statistics and data visualization techniques.
  + Feature Engineering: Creating meaningful features from raw data to improve model performance; techniques for feature extraction, transformation, and selection.
  + Foundational Machine Learning: Fundamentals of machine learning and basic concepts (features, labels, and models). Introduction to supervised learning (regression, classification). Introduction to unsupervised learning. Model evaluation (cross validation and bootstrapping).
  + Data Visualization: Creating visual representations of data to effectively communicate insights. Different types of visualizations, tools like Matplotlib or Tableau, and best practices for visualizing data.

## Online training resources

* Introduction to Data Science Specialization by Coursera and IBM: This online training program is designed to provide learners with a comprehensive introduction to the field of data science. The specialization consists of a set of courses that cover various topics and skills related to data science. (coursera.org/specializations/introduction-data-science).
* Coursera: Offers a wide range of data science courses and specializations from top universities and institutions. (coursera.org/browse/data-science).
* edX: Provides online courses in data science from leading universities and institutions. (edx.org/learn/data-science).
* Udacity: Offers nanodegree programs and courses in data science, machine learning, and related fields.
* IBM Data Science: Provides a range of data science courses and learning paths. (ibm.com/training/search?query=data science).
* The National Consortium for Data Science (NCDS): NCDS helps members take advantage of data in ways that result in new jobs and transformative discoveries. (https://datascienceconsortium.org/).

Development of Data Visualization Products

## Competency development areas in data visualization

* Fundamentals of Data Visualization: The principles of effective data visualization, including visual perception, data types, and design considerations.
* Data Visualization Tools and Technologies: Popular data visualization tools and technologies such as Tableau, Power BI, D3.js, and Python libraries like Matplotlib and Plotly.
* Dashboard Design and Storytelling: Techniques for designing dashboards that provide a comprehensive view of data and tell a coherent story. Learn about layout, hierarchy, and effective use of annotations and narrative.
* Data Visualization Best Practices: Best practices in data visualization and using appropriate visualization techniques for different types of data and insights.

## Online training resources:

* Data Visualization and Communication by the University of Illinois at Urbana-Champaign on Coursera. This course provides an introduction to data visualization principles and techniques. ([coursera.org/learn/datavisualization](https://www.coursera.org/learn/datavisualization))
* Fundamentals of Visualization with Tableau: fundamental concepts of data visualization (coursera.org/learn/data-visualization-tableau)
* Tableau self-paced eLearning paths and courses ([tableau.com/learn/training/elearning](https://www.tableau.com/learn/training/elearning))
* Data Visualization and Communication with Tableau: Offered by the University of California, this course covers the principles of effective data visualization, explores different chart types, and teaches how to create interactive dashboards using Tableau. ([coursera.org/learn/datavisualization](http://www.coursera.org/learn/datavisualization))
* DataCamp ([datacamp.com](http://www.datacamp.com)); Udemy (udemy.com); Coursera (coursera.com); LinkedIn Learning ([linkedin.com/learning](http://www.linkedin.com/learning)); Tableau Public (public.tableau.com); YouTube Channels.

## Online training resources in data visualization specifically tailored for federal employees:

* Data Visualization Communities of Practice at different agencies.
* Federal Virtual Training Environment (FedVTE) - free online training courses for federal employees, including courses on data visualization (fedvte.usalearning.gov).
* Digital.gov - a resource hub for federal agencies, providing guidance, tools, and training resources related to digital services and technology (digital.gov).
* Data.gov - open data portal, providing access to various datasets; also offers resources and tutorials on data visualization and analysis using government datasets ([data.gov](http://www.data.gov))

Predictive analytics

## Competency development areas in predictive analytics

* Introduction to Predictive Analytics: Basic Modeling Techniques: The fundamentals of analytics and its different types: descriptive, predictive, and prescriptive analytics. Learn how they provide insights and drive decision-making at different levels. Foundational predictive analytics, its applications, and the value it provides in making data-driven predictions and decisions.
* Statistical Concepts for Predictive Analytics: Key statistical concepts and techniques used in predictive analytics, such as probability, hypothesis testing, regression analysis, and time series analysis.
* Predictive Modeling Algorithms: Various predictive modeling algorithms, including linear regression, logistic regression, decision trees, random forests, support vector machines, and neural networks. Understanding the strengths, limitations, and appropriate use cases for different algorithms.
* Skills Gap Analysis and Workforce Development: Leveraging predictive analytics to identify skills gaps within the workforce and develop targeted training and development programs. Techniques for analyzing skill needs, forecasting future skill requirements, and designing workforce development initiatives.
* Employee Retention and Attrition Prediction: Analysis of factors influencing employee attrition; identification of strategies for improving employee retention. Using predictive modeling to identify at-risk employees and develop targeted retention initiatives.
* Talent Acquisition and Recruitment Analytics: Leveraging predictive analytics to improve talent acquisition and recruitment processes. Techniques for predicting candidate success, identifying top performers, optimizing job advertisements, and reducing time-to-hire.
* Predictive Modeling Techniques for Workforce Planning: Predictive modeling techniques for workforce planning, such as regression analysis, time series forecasting, and classification algorithms. Understand how to use historical data to predict future workforce needs, attrition rates, skill gaps, and other workforce-related factors.

## Online training resources

* Predictive Analytics Courses on Udemy: These self-paced courses typically include video lectures, coding exercises, quizzes, and assignments to enhance learners’ understanding and practical skills in predictive analytics. (udemy.com/topic/predictive-analytics/).
* … Analytics: Basic Modeling Techniques” are worth

Fundamentals of AI

* Introduction to AI: A broad introduction to AI concepts and techniques, including machine learning, neural networks, natural language processing, and computer vision. This course does not require any programming or computer science expertise and is designed to introduce the basics of AI to anyone whether you have a technical background or not.
* Artificial Intelligence A-Z: Learn How to Build an AI on Udemy: This course covers the fundamentals of AI and guides you through building various AI models and applications using popular tools and frameworks.
* AI for Everyone by deeplearning.ai on Coursera: This course provides a non-technical introduction to AI, exploring its impact on society and various industries. It covers key AI concepts and helps you understand how to leverage AI in business settings.

## Online training resources

* [coursera.org/learn/introduction-to-ai](https://www.coursera.org/learn/introduction-to-ai)
* udemy.com/course/artificial-intelligence-az/
* coursera.org/learn/ai-for-everyone

## Online training resources in AI specifically tailored for federal employees:

* Federal Virtual Training Environment (FedVTE): FedVTE offers a wide range of IT training courses, including AI-related topics. It is available for federal employees and provides self-paced online training in various areas of AI, machine learning, and data science.
* AI.gov's AI Training: AI.gov, the official website of the U.S. government's AI efforts, provides various resources and training materials on AI. They offer online courses, tutorials, and case studies specifically tailored for government employees.

ChatGPT for Problem Solving

* Introduction to ChatGPT:
  + Overview of OpenAI and ChatGPT
  + ChatGPT features, capabilities and limitations
  + The art of asking questions to ChatGPT
  + Personalizing ChatGPT
* Using ChatGPT for Productivity:
  + Integrating ChatGPT with business tools (Outlook, Teams, Excel, Power Automate).
  + Prompt engineering for fine-tuning outputs
  + Building chatbots with ChatGPT
* Using ChatGPT for Decision Support and Content Creation
  + Business use cases for ChatGPT (ChatGPT can assist in decision-making processes by providing data-driven insights, performing quick analyses, and offering recommendations based on available information. It can help executives and managers make informed decisions more efficiently)
  + Leveraging ChatGPT to generate creative content (blog posts, articles, or social media posts based on given prompts or topics)
  + Leveraging ChatGPT to curate and recommend relevant content to users based on their interests and preferences

## Online training resources

* EdX: Practical introduction to ChatGPT, from signing up to mastering its advanced features. (https://www.edx.org/search?q=Introduction+to+ChatGPT)

Data catalogs, data governance, data stewardship

## Competency development areas in data catalogs, data governance, data stewardship

* Data Catalog Architecture and Components: The architecture of an enterprise data catalog and its various components. Metadata repositories, data connectors, search interfaces, and data profiling tools.
* Data Discovery and Data Lineage: Using enterprise data catalogs to facilitate data discovery and lineage tracing. Techniques for searching and exploring data assets, viewing data relationships, and tracking data lineage for compliance and audit purposes.
* Data Governance and Data Stewardship: The role of data governance and data stewardship in enterprise data catalogs. Establishing data policies, assigning data ownership, and enforcing data standards using a data catalog.
* Data Catalog Integration: Integrating an enterprise data catalog with existing data management systems and tools such as data warehouses, data lakes, data integration platforms, and data governance frameworks.

## Online training resources

* Collibra University: Collibra University offers online training courses on data cataloging and data governance. Their courses cover topics such as data catalog implementation, metadata management, and data governance best practices. (university.collibra.com).
* Alation Data Governance Course: Alation Academy provides online training courses on the basic framework for Data Governance, metadata management and data quality, data cataloging using the Alation Data Catalog platform. Their courses cover topics like data catalog administration, data discovery, and collaboration within a data catalog environment. (alation.com/data-governance-course/)
* Informatica Data Catalog Training: Informatica provides online training resources for their Data Catalog product. Their training includes tutorials, videos, and documentation on data catalog features, data discovery, and metadata management. (community.informatica.com).

Cybersecurity

## Competency development areas in cybersecurity

* AI for Cybersecurity: Basic concepts and applications of artificial intelligence and machine learning in the field of cybersecurity. Threat Detection and Analysis: Utilizing AI techniques to detect and analyze cyber threats.
* Emerging Technologies and Threats: Emerging cybersecurity technologies, trends, and threats such as Artificial Intelligence (AI) in cybersecurity, Internet of Things (IoT) security, Blockchain security, and cloud-native security.
* Federal Risk and Authorization Management Program (FedRAMP): Based on the FedRAMP framework, which provides a standardized approach to assessing and authorizing cloud service providers for federal government use. Understand the security requirements and processes involved in FedRAMP compliance.
* Security Assessment and Authorization: The process of conducting security assessments and authorizations for federal systems and applications. Understand the roles and responsibilities of federal employees in the SA&A process.
* Federal Information Security Management Act (FISMA) Compliance: The requirements and guidelines outlined by FISMA for federal information security.
* Cyber Threat Intelligence: Methods for gathering, analyzing, and interpreting threat intelligence data to identify potential cyber threats and vulnerabilities.
* Security Governance and Compliance: The frameworks, policies, and standards governing cybersecurity practices, such as the NIST Cybersecurity Framework, ISO 27001, and regulatory compliance requirements like GDPR or HIPAA.
* Cloud Security: Security considerations and controls specific to cloud computing environments. Shared responsibility models, cloud security architecture, and cloud provider security features.

## Online training resources

* CompTIA: CompTIA offers online training resources and certifications in cybersecurity. They cover topics like cybersecurity fundamentals, network security, and security management. Their certifications, such as Security+ and CySA+, are highly regarded in the industry. ([comptia.org/training/certmaster-learn/security](https://www.comptia.org/training/certmaster-learn/security)).
* SANS Cyber Aces Online: SANS Cyber Aces Online provides free foundational cybersecurity training, including modules on networking, operating systems, and cybersecurity principles. This resource is suitable for beginners looking to build a solid cybersecurity knowledge base. (sans.org/cyberaces/).
* National Initiative for Cybersecurity Careers and Studies (NICCS): NICCS provides a catalog of cybersecurity training resources, including online courses, virtual labs, and webinars. Their catalog can be searched for relevant training based on specific cybersecurity interests and skill level. (niccs.cisa.gov/education-training/catalog).

## Online training resources in cybersecurity specifically tailored for federal employees:

* Federal Cyber Defense Skilling Academy: An intense, full-time, three-month accelerated training program, which helps civilian federal employees develop their cyber defense skills through training in the baseline knowledge, skills and abilities of a Cyber Defense Analyst (CDA). (cisa.gov/resources-tools/programs/federal-cyber-defense-skilling-academy).
* Federal Virtual Training Environment (FedVTE): Self-paced courses on cybersecurity-related topics that are free to government employees, federal contractors, military, veterans and the public. (niccs.cisa.gov/education-training/federal-virtual-training-environment-fedvte).

Data Analytics

Upskilling topics in data analytics typically focus on developing skills and knowledge in various aspects of data analysis, interpretation, and utilization.

## Competency development areas in data analytics

* Data Visualization and Reporting: Competency in data visualization involves effectively representing and communicating data insights through visualizations and reports. This includes selecting appropriate visualization techniques, understanding visual design principles, and conveying data-driven narratives.
* Data Storytelling and Communication: Training in storytelling with data focuses on communicating data insights through compelling narratives. It covers techniques for structuring data stories, using visual cues, using storytelling techniques, and delivering impactful presentations.
* Data Analytics Essentials with Power BI: The essentials of Power BI Desktop including: (1) Data Preparation (2) Data Modeling (3) Data Visualization (4) Data Analysis Expressions (DAX)

## Online training resources

* Power BI Guided Learning by Microsoft: This resource provides a collection of tutorials and learning materials for Power BI, a powerful data analytics and visualization tool. (https://learn.microsoft.com/en-us/training/browse/?products=power-bi)
* Google Data Analytics Professional Certificate: An online program offered by Google on the Coursera platform. It is designed to provide learners with the skills and knowledge necessary to start a career in data analytics. The program consists of a series of courses that cover various aspects of data analysis, including data cleaning, analysis, visualization, and interpretation. (coursera.org/professional-certificates/google-data-analytics)
* Data Visualization and Communication by the University of Illinois at Urbana-Champaign on Coursera. This course provides an introduction to data visualization principles and techniques. ([coursera.org/learn/datavisualization](https://www.coursera.org/learn/datavisualization)).
* udemy.com/course/ai-driven-data-storytelling-with-powerbi-2023/
* https://www.udemy.com/course/data-analytics-essentials-with-power-bi/

Agile Development

Training topics in Agile Development can vary depending on the level of proficiency and specific needs of the individuals or agency. However, here are some common training topics in Agile Development.

* Introduction to Agile: An overview of the Agile principles, values, and methodologies. Scrum Framework: Understanding the Scrum framework, roles (Scrum Master, Product Owner, Development Team), ceremonies (Sprint Planning, Daily Standup, Sprint Review, Sprint Retrospective), and artifacts (Product Backlog, Sprint Backlog, Increment).
* Agile Project Management: Techniques and tools for managing Agile projects, including user stories, backlog management, release planning, and Agile metrics.
* Agile with Atlassian Jira: Common foundational principles and practices used by agile methodologies, providing learners with a flexible set of tools to use in your role (e.g. product owner, scrum master, project manager, team member) on an agile team. Learn agile and lean principles, including kanban and scrum, and use Jira Software Cloud as the tool to apply hands-on exercises in these topics.

## Online training resources

* Agile and Scrum Fundamentals: A free training program that provides an introduction to Agile principles and the Scrum framework. (edx.org/course/agile-and-scrum-fundamentals).
* Agile Project Management: A training program that provides an in-depth understanding of Agile principles and practices in the context of project management.
* Agile with Atlassian Jira: (1) Basics of agile methodologies (scrumand and kanban) (2) How to apply agile practices in Jira Software Cloud (3) How to create and manage agile boards in Jira Software Cloud.

Cloud Computing

* AWS Learning Library: A comprehensive online training and certification platform, which provides a wide range of learning resources, including courses, labs, and documentation, to help individuals gain knowledge and skills in using AWS services. It covers various topics such as cloud computing, architecture, security, machine learning, and more. (aws.training/LearningLibrary).
* Microsoft’s e-learning platform: Provides a self-directed way of learning, featuring Azure step-by-step tutorials, interactive environments, and custom learning paths that help learners achieve industry-recognized certifications. (https://learn.microsoft.com/en-us/training/).
* Cloud Academy: An online training platform that offers a variety of courses, learning paths, and hands-on labs focused on cloud computing and related technologies. It provides training and certification preparation for major cloud platforms, including Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and more.Cloud Security: Training on cloud security practices, including identity and access management, data encryption, network security, and compliance. (cloudacademy.com)

As discussed at the contractors’ meeting yesterday, we are looking for subject matter experts who could do several 20-30 minute presentations of educational topics in their fields of expertise over the course of the July, August and September Data Analytics CoP meetings. It could be individuals with deep knowledge, expertise, and experience in such fields as data analytics, data science, data visualization, machine learning, or similar. What is essential is their ability to present and communicate these concepts in a compelling and engaging way to a non-technical audience. What we are looking for initially is introductory-to-intermediate level presentations on such topics as:

* Data visualization and reporting: how to effectively represent and communicate data insights through visualizations and reports.
* Data storytelling and communication: communicating data insights through compelling narratives. It covers techniques for structuring data stories, using visual cues, using storytelling techniques, and delivering impactful presentations.
* Exploratory data analysis (EDA): using EDA to help understanding the data, validate assumptions, clean data, handle missing values, etc.
* Descriptive analytics: summarizing and interpreting historical data to gain insights and understand past patterns and trends, analyzing data to answer questions such as "What happened?" and "What is the current state?" Steps to do a retrospective analysis to understand the characteristics, distribution, and relationships within the data. This could lead to a follow-up session on predictive analytics (using historical data, statistical algorithms, and machine learning techniques to make predictions about future events or outcomes).

It could be any similar topic or topics. Essentially, we need effective presenters who can break down complex ideas into simpler terms, frame their presentation as narratives that capture the attention of the audience while keeping the content concise and focused.