

STEM Day Datapalooza - Fact Sheet

The Office of Personnel Management (OPM) and the Office of Science and Technology Policy (OSTP) in the Executive Office of the President (EOP) are pleased to present the Federal STEM Workforce Datapalooza as part of the STEM Day celebration event. Attendees will be able to learn about the work and accomplishments of five exciting projects partnering Federal agencies with one another and the private sector to help address important challenges around the Federal STEM workforce. OPM and OSTP partnered together to organize and host a data jam to addresses issues relating to the Federal STEM workforce back in late January 2014. After the day of high-energy brainstorming, many participants from both the private and public sectors came together to take some of the concepts that were generated during the data jam and turn them into reality.

Below you will find a brief description of each of the five projects and their progress to date. If you are interested in learning more about a particular project, please reach out to the point of contact for that project indicated below. We are thrilled with the incredible collaboration that has taken place here between federal agencies and the private sector to help address some of the challenges in building and maintaining a successful STEM workforce to serve the American people. Our hope is that these collaborations continue and that agencies continue to develop, collect and liberate additional data to keep engaging with the public to address these issues.

Projects

Hiring Manager's Portal- *Equip Managers to Attract and Find Quality STEM Candidates*

The goal of the Hiring Manager's Portal is to deliver a set of capabilities that will assist hiring managers in developing quality Job Opportunity Announcements, as well as find quality STEM candidates for hard-to-fill positions. Individuals from OPM, Excella, Novitas, and Sentinel came together to develop a proof of concept capability to:

- Help managers find the right talent;
- Analyze job seeker data to gather insight into STEM skills and qualifications; and
- Analyze historical Job Opportunity Announcements (JOAs) to craft better announcements.

The project team is delivering a working prototype of how to mine the database for specific STEM skillsets and qualifications. In addition, the capability will provide visualizations to represent skill clusters and other data to inform managers on developing adequate staffing plans and effective JOAs. The next part of the project includes delivering visualizations about JOAs for STEM positions based upon historical data. This capability will serve agencies in identifying quality and effective JOAs for future planning needs.

Anyone interested in learning more about the Hiring Manager's Portal project can contact Michelle Gilder Earley at michelle.earley@opm.gov.

Data Science Ladders- *Help Employees Build STEM Skills*

Data Science Ladders is a central, online resource where government employees can learn data science concepts, practice their newly-learned skills, and document their progress through peer-to-peer social learning. Ultimately, government hiring officials could recruit from the site by searching profiles for skills learned and challenges completed.

Through collaboration between OPM, the Department of Veterans Affairs and the Department of the Interior, the site is being built around the Drupal Ladders concept (<http://drupalladder.org/>) using the open source Drupal-based Opigno Learning Management System (<http://datascienceladders.myopigno.org/>). There will be a core ladder with lessons devoted to critical thinking and basic statistical skills, while surrounding the core ladder will be a variety of specialized ladders devoted to topics such as Python programming, Hadoop, and other data science concepts and skill areas. There will be a badging system with leaderboards to encourage users to complete multiple lessons while instilling friendly competition.

Lessons will be collated through community-created and free online sources. Experienced STEM professionals can petition to establish a ladder where they will be responsible for creating and/or curating lessons. Users will create profiles that showcase their progress through the ladders and allow them to connect with other users of similar interest for peer mentoring. Users can make their profiles searchable to recruiters to help fill critical job openings in the skill areas that have learned. The Challenges feature will include many valuable resources from simple Q&A forums where users can rate the quality of answers to training challenges and opportunities similar to Kaggle competitions where users can further hone their skills and demonstrate their master of STEM topics.

Anyone interested in learning more about the Data Science Ladders project can contact William Brantley at william.brantley@opm.gov.

STEM Employee Directory- *Find Existing Federal Employees with STEM Skills and Experience*

The STEM Employee Directory is intended to allow authorized users to search for employees working in the STEM fields within the Federal government, as well as the subset of Federal employees who have extensive STEM related skills, experiences, and education that are not employed in a STEM job series (identified through a STEM job code). OPM, along with Thought Layer, are applying an innovative approach to integrating disparate data sources from within OPM and the Federal government to bring this concept to fruition.

OPM and Thought Layer's approach to developing the STEM directory is built upon Semantic Information Management standards and technology. This approach will provide the integration of various STEM data sources, both structured and unstructured, in a highly flexible and context aware manner. A semantic technology approach to data integration was taken for several reasons, such as flexibility, scalability, and the capability to query multiple data sources and use existing sources without changing the underlying data.

Anyone interested in learning more about the STEM Employee Director project can contact Huy Le at huy.le@opm.gov.

STEM Data Catalog- *Better Understand our Current STEM Workforce*

The STEM Data Catalog team led by Gary Lukowski at OPM and including individuals from Socrata, Information Unlimited, Inc. and Gild, stood up an online HR STEM data community and catalog to provide a space for interested stakeholders to access and visualize federal human resources data from the Office of Personnel Management (OPM). The catalog allows users to perform analytics and business intelligence via built-in APIs, as well as explore the spread of STEM skills across the federal government using a variety of visualization and charting tools.

The team integrated data from OPM's FedScope system into the catalog, along with creating a series of investigative visualizations, and built a prototype node-based visualization to explore the

relationship between STEM-classified employees and their federal agency. Overall, the catalog provides a central portal for government managers and employees to analyze, visualize and eventually predict trends within the federal STEM workforce. The initial prototype only included one snapshot of data from OPM's FedScope system, however future iterations will include data across multiple years and more detailed taxonomies to facilitate data mining, predictive analytics and workforce profiles to facilitate attraction and retention of ideal employees in the Federal STEM workforce.

Anyone interested in learning more about the STEM Data Catalogs project can contact Gary Lukowski at gary.lukowski@opm.gov.

STEM Applicant Dashboard- *Using Data to Understand How to Attract Diverse STEM Applicants*

OPM partnered with Excella to address Factors for Promoting Diversity in the STEM workforce. The team proposed the creation of a Diversity Dashboard, with the central concept to create a tool that hiring managers could use to visually see when and at what stages they were losing the candidates they were seeking to employ. By utilizing USAJOBS data, FORESEE Survey data, and USA STAFFING Applicant data, the team was able to create a comprehensive STEM Applicant Dashboard.

The dashboard provides user with a tool to take a data-driven approach to answering several questions related to the STEM applicant pool, including, "What does the applicant pool look like?" and, "How does the applicant pool change throughout the hiring cycle?", as well as the most important question, "Where is the data?" Through the creation of the dashboard the team was able to create a visual display of the data that not only encompasses millions of records to answer the aforementioned questions, but does so in a way that is accessible and easy to understand, transforming the "Where" to "How do we make effective use of the data".

Anyone interested in learning more about the STEM Applicant Dashboard project can contact team lead Ray Parr at ray.parr@opm.gov.