INTRODUCTION

In June 2014, The Governance Lab (GovLab) at NYU launched a series of Open Data Roundtables to bring together government data providers with data users in the private and non-profit sectors. The goal of the Roundtables has been to help agencies prioritize their work on open data more effectively, meet the needs of businesses and other data users more efficiently, and create social and economic value from the government's vast data resources.

On December 8, 2014, The GovLab and the U.S. Patent and Trademark Office (USPTO) co-hosted an Open Data Roundtable in Washington, DC. The impetus for this event was the first Open Data Roundtable, held with the U.S. Department of Commerce where USPTO identified a need to further engage its data users in devising its open data roadmap for the next few years. At the USPTO Roundtable, Alan Marco, USPTO's Chief Economist, and Lynn Overmann, Deputy Chief Data Officer of the Department of Commerce (DOC), both emphasized the agency's desire to more actively engage data users and technologists by involving the developer community and creating ongoing feedback loops and collaborations. This Roundtable was primarily focused on USPTO's patent data, which is much more challenging than trademark data: while owners wish to promote their trademarks, and thereby provide good data to USPTO, there are many more data collection, format, and quality issues associated with patent data.

USPTO's data holds the history of American ingenuity, and the USPTO's founders made data dissemination part of its mission. However, the USPTO is faced with many challenges, ranging from legislative hurdles to legacy systems. The technology leadership of the USPTO is now focused on the Office's long-term commitment to providing patent and trademark data as public resources.

This Roundtable was attended by representatives from 14 companies and four academic institutions, the chairman of the Patent Information Users Group (PIUG), two Presidential Innovation Fellows from the U.S. Department of Energy, and two dozen participants from USPTO and DOC. In addition to Lynn Overmann and Alan Marco, the participants heard from Michelle Lee, Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director of the USPTO, and Thomas Beach, Senior Advisor at the Office of the Under Secretary and Director at the USPTO.

At the Roundtable, the USPTO presented a roadmap for open data initiatives designed to provide better access to USPTO's data assets and better engagement of the USPTO's community of data users. The main elements of this roadmap included:

- The launch of a new, mobile-friendly USPTO.gov website in Q1 2015;
- The publication of technical architecture, to include shared services, data formats, documentation, security/access measures, standards for APIs (application program interfaces), and collaboration tools;
- The release of an API for Public PAIR. The Patent Application Information Retrieval (PAIR) system provides its users a safe, simple, and secure way to retrieve and download information regarding patent application status. (There are two PAIR applications: Public PAIR provides access to issued patents and published applications, whereas Private PAIR provides secure real-time access to pending application status and history using digital certificates);
- The release of an API for Patent Assignments data;
- Publication of a public-facing data inventory;
- The development of a community governance plan and USPTO community partnerships;
- Hosting a series of roundtables, data jams and hackathons throughout 2015 and 2016; and
- Inaugurating a USPTO Datapalooza in 2016.

In addition to its Open Data Roadmap, the PTO presented three initiatives at the Roundtable, which are currently in beta:

i) PatentsView, This patent visualization tool is intended to allow users to explore inventors and their assignees, patent classes, and locations for over 5 million U.S. patents. Its three aspects are aimed at engaging all types of users: an API for developers, a query tool for economic and legal research, and visualization for general users. Starting with the U.S. Department of Agriculture (USDA), PatentsView is working with federal agencies to track federal funds going to inventors. The USPTO is also working on a map to visualize the number of patents in each location, locally and internationally, to see technologies and investors geographically.

ii) Electronic Data Hosting. This master repository of public bulk, electronic data provides a RESTful architecture solution to replace the current file-based approach to accessing bulk data. It allows users to search data without having to download the entire dataset.

iii) Assignment Search. This searchable database contains all recorded Patent Assignment information dating back to August 1980. Its data is updated weekly. It allows users to also 'add synonyms' to search companies using different names to register their patents.

This report is being released as a public document with the hope that it will encourage further input, dialogue, and agency commitments. It encapsulates the recommendations made by USPTO's data users, both internal and external, who participated in the Roundtable, and describes the open data priorities they have identified. The report is designed to be of value to the departments at USPTO that collect, analyze, and disseminate data; officials in other government agencies working to improve their agencies' open data capabilities; individuals and organizations who use USPTO's patent data; and interested members of the media and the public.

Glossary of Acronyms

API	Application Program Interface
CPC	Cooperative Patent Classification
CRADA	Cooperative Research and Development Agreement
ECLA	European Classification
EPO	European Patent Office
MCF	Master Classification File
NAICS	North American Industry Classification Standards
PAIR	Patent Application Information Retrieval
USPC	United States Patent Classification
USPTO	U.S. Patent and Trademark Office

ROUNDTABLE INSIGHTS AND RECOMMENDATIONS

The Roundtable discussions covered three key areas where USPTO can further develop its open data strategy and increase the potential to leverage patent data: user engagement, data access and availability, and data quality and interoperability. Beyond the value to be gained from feedback and collaboration among open data stakeholders, The GovLab recognizes the need for continued research and mapping of the open data ecosystem.

These areas for improvement mirror the findings of The GovLab's earlier Roundtable with the U.S. Department of Commerce, and may apply to other federal agencies as well. That earlier Roundtable identified seven areas of improvement: (i) treating data users as customers by engaging with them and getting their input and feedback on a regular basis; improving data (ii) discoverability and findability, (iii) access and availability, (iv) quality, and (v) interoperability; and new strategies to (vi) collect and (vii) disseminate data. The USPTO's 'in flight' initiatives (though in beta) will go a long way towards making it easier to find and discover patent data, and achieve wider data dissemination. In the case of USPTO's data, the data collection processes are inseparable from data collection issues, and these concerns are treated as a single area for improvement.

USPTO's Current Data Assets

Patent Information Products (daily/weekly /monthly/cumulatively)

- Patent Grants – Images/Text/Bibliography with selected information from 1790 to present
- Patent Applications – Images/Text/Bibliography from 2001 to present
- Patent Assignment/Classification Products
- Patent Official Gazette (every Tuesday)
- Public PAIR Data – highly detailed patent information from 1980-present

Trademark Information Products (daily/weekly /monthly/cumulatively)

- Trademark Registration Images from 1870 to present
- Trademark Application Images from 2010 to present and text from 1884 to present

Patent Technology Monitoring Reports

- Patent Summary Reports by demographics, geocoding and domain categories

---

USER AS CUSTOMER

USPTO, like other federal agencies, is beginning to think of its data stakeholders – both current and potential – as "customers" for their data. This concept is the basis for developing a more user-focused approach to data collection and dissemination. In the context of patent data, stakeholders include not only users of patent data but also users of the patent system: inventors, patent experts and attorneys, patent examiners, and the USPTO itself.

Goal: To better identify patent data stakeholders, establish communities of interest and feedback loops, and increase the number and depth of USPTO's interactions with its data users.

Desired impact: To help the community of patent users become better informed, connected, and engaged.

PRIORITIES & RECOMMENDATIONS

- Develop an outreach plan for all patent stakeholders to include: inventors, the public, data vendors, known USPTO data users and intermediaries, law firms and patent attorneys and patent examiners, and internal USPTO groups. Individual suggestions for an outreach plan included:
    - Collecting user information held internally. This can include identifying patent users from requests and emails received by individual members of USPTO, and creating a listserv of external patent data users.
    - Forming 'affinity groups' of USPTO staff and external stakeholders; including a group for interested examiners and USPTO personnel that also provides a bridge with volunteer technical experts.
    - Engaging patent experts within industry and academia.
    - Identifying USPTO datasets for different kinds of communities to engage with on a geographical and industry basis. Patent data on selected sectors – such as energy, automotive and others – would be of interest to different innovation communities around the country.
    - Building a developer community, perhaps a virtual community, that is specific to USPTO's data. Elsewhere, DOC is starting to build a developer relations team, and the Census Bureau has created a developer community of its own.
    - Providing internal training for USPTO's data users.
    - Creating a GitHub account for the USPTO.
    - Expanding USPTO staff attendance at conferences.
    - Exploring cooperative research and development agreements (CRADAs) – agreements between a government agency and a private company to work together on specific research and development projects.[1]
    - Obtaining public feedback on proposals, with data vendors participating earlier in data quality and standardization efforts, allowing these stakeholders to test and give input on initiatives.
- Articulate the value of the information held in USPTO's data for non-technical users, and add more context to make it usable by non-experts. For instance, lawyers are rarely technological experts, while inventors may be intimidated by legal jargon.
- Provide a public-facing point of contact for all data queries: a data librarian, data concierge, or data "contentist".
- Provide a point of contact or communication channels for civic tech volunteer groups and civic tech entrepreneurs.
- Align events such as hackathons, data jams, and datapaloozas with open data releases and/or tools. For instance, hackathons can be timed to follow beta launches of APIs as an opportunity for coders, developers and designers to build apps or visualizations using the API. Similarly, data jams could be used as a part of agile development within open data efforts, for example as a means to pilot data cleaning efforts. It might be useful to engage not only data users but also other users of the patent system – lawyers, inventors, large and small firms providing data – to see how they would react to different applications and uses of patent data.

---

[1] USGS. http://www.usgs.gov/tech-transfer/what-crada.html

- Better promote events through USPTO's network of patent and trademark institutions, the Patent Information User Group (PIUG), 18F resources at GSA, USPTO's website, an internal listserv, the Inventor's Eye newsletter, and other means.
- Address the legislative constraint that prevents patent examiners from interacting with the public. While the public may challenge patent applications by submitting examples of prior art voluntarily, Section 122(e) of Title 35 of the U.S. Code, Section 122(c) prohibits USPTO from encouraging such challenges to applications.[2] In practice, this affects examiners who can get technical information on prior art from Ask Patents,[3] but cannot look at arguments from the people submitting the prior art. Roundtable participants recommended obtaining clarification from Congress on the intent of the statute and allowing examiners to interact with the public.
- Create feedback mechanisms across all UPSTO open data efforts.
- Provide measurements of success for open data initiatives.

---

[2] USPTO Manual of Patent Examining Procedure, Chapter 1100, Section 1134, Third Party Inquiries and Correspondence in a Published Application. http://www.uspto.gov/web/offices/pac/mpep/s1134.html.

[3] Ask Patents, StackExchange. http://patents.stackexchange.com/.

DATA ACCESS & AVAILABILITY

Data repositories use multiple formats and languages to help users access data, which may be stored in a variety of different and sometimes incompatible formats. Roundtable participants highlighted overwhelming priorities for information dissemination: access to bulk Public PAIR and CPC data, data on the status and expiration of patents, and increased notification of changes affecting data classification, access, and availability. The first of these – access to public PAIR data – was addressed by the USPTO at the opening of the Roundtable, and validated by participants as addressing one of biggest access challenges faced by users of patent data.

Goal: To provide better access to more USPTO data, and better information on policies and procedures affecting quality, access and availability of USPTO data.

Desired impact: To increase both the number of users of and ease of access to USPTO data in an egalitarian manner.

PRIORITIES & RECOMMENDATIONS

- Provide daily updates and bulk access to Public PAIR data[4] to better facilitate statistical analysis of patent data. To facilitate faster access, participants suggested providing an option to access Public PAIR without the 'file wrappers'. These are the written record of negotiations between an applicant and the office preceding the issuance or rejection of a patent, and are frequently in PDF/image formats. Concurrently, for those who desire easier image search and comparisons of patent design, USPTO can provide image file wrappers in a machine-readable format, integrated as part of the API.
- Map Cooperative Patent Classifications (CPC) codes to Master Classification Files (MCF) from 1976 to the present. The U.S. Patent Grant MCF contains classification information on all patent grants issued by the USPTO, and is available bimonthly.[5]
- Provide USPTO's users with more information about the Office's open data initiatives, including any potential ramifications of changes in policy for data users. Recommendations included:
  - Providing information and notice on any changes in USPTO policies and practices or related legislation. Users would like advance notice of policy initiatives coming up and how they will affect the delivery of USPTO's data. For instance, when changing options for accessing data, the USPTO should inform users of the availability of old links to the data; any retagging (and inclusion) of older data in new data products; the formats in which bulk data is available via APIs (json or just xml); and the availability of permalinks to the patents themselves within the new products and APIs.
  - Providing public notice of data releases.

---

[4] Public PAIR data includes:
  - Application data – all of the bibliographic data such as application number, status, publication number, examiner name, class/subclass, inventor, and title among other fields;
  - Transaction history – a list of transactions during the prosecution as well as the date on which they occurred;
  - Image File Wrapper – the file wrapper contains PDF images of the various stages of prosecution (ie. applicant submitted claims, fee worksheets, non-final rejections, list of references, issue information etc.);
  - Patent Term Adjustments – this gives the history of patent term adjustments petitioned and received, although no individual documents are available for public download;
  - Continuity Data – if the record has any parent or child continuity data, the document numbers will be listed (and linked, if possible) here;
  - Fees – This tab generates a pop up window with the data needed to inquire about whether fees are up to date (from another part of the USPTO website);
  - Published Documents – If there are related published documents they are listed here with links to view the full-text and image of said documents as well as access their respective PAIR entries;
  - Address & Attorney/Agent – Correspondence address for the attorney prosecuting the case as well as the other attorney/agents involved

[5] The CPC effort is a joint effort between the USPTO and the European Patent Office (EPO) where the Offices have agreed to harmonize their existing classification systems (European Classification (ECLA) and United States Patent Classification (USPC) respectively) and migrate towards an internationally compatible classification system. This common scheme applies to technical documents, in particular patent publications, used by both offices in the patent granting process.

- Clarify how USPTO open data initiatives relate to and are affected by legislative reform, international initiatives, other USPTO initiatives such as crowdsourcing and Patent Trial and Appeal Boards (PTAB) trials.[6]
- Providing information on the process of patent examination in the interest of transparency
- Addressing concerns about whether USPTO data will be permanently available and accessible. For example, perhaps USPTO could provide a service-level agreement (SLA) that data will be available over time.
- Providing as much information as possible for developers, such as a schedule for when files are added or deleted.
- Providing more granularity and updated information on processes, implementation, and implications for users – including information on the patent process and the examining process.
- Providing information on Serial Numbers and their periodic recycling, including records of the data structures. This data is a lengthy time series, including many changes, but there is limited available documentation of the evolution of serial numbers.
- Providing the North American Industry Classification System (NAICS) code on Patents.
- Making available USPTO's Patent Technology Monitoring Team's statistics.

- Make available more information on patents granted via government contracts through iEdison (Interagency Edison) – the interface for grantees and contractors to interact with any participating agency. iEdison helps government grantees and contractors comply with the Bayh-Dole Act requiring that government-funded inventions be reported to the federal agency that made the award.[7]

- Provide data on the legal status and enforceability of applications: whether an application is in progress/provisional, litigated, approved, reinstated or abandoned/expired. If litigated, users would like to know the outcome of the process.
  - Provide bulk access also to rejected patent applications. Participants noted the lack of transparency in patent examination, especially a lack of information on why patents are rejected. There is no way to do statistical analysis, for example, on the impact of case law or legislation on the admissibility of patents. When a patent application is rejected, examiners write up the reason for its rejection. If the applicant had published the application, the reasons for the rejection are also made public. However, without bulk access to the decisions rejecting both published and unpublished patents, users are unable to analyze the reasons for rejection statistically across a number of patent applications and types.
  - Provide certifications of corrections of patents when these are made.
  - Explore opportunities for moving to new systems at USPTO, with easy, discrete changes. For instance, integrating File Forms AO120 from local district courts would provide information on whether a patent has been filed in a suit.[8] Such changes can be implemented on a 'moving forward' basis, while later going back to integrate historical data.

---

[6] PTAB Trials, U.S. Patent and Trademark Office, https://ptabtrials.uspto.gov/.

[7] iEdison. https://public.era.nih.gov/iedison/.

[8] When a civil action is filed regarding a patent or trademark, the U.S. Patent and Trademark Office (USPTO) must be notified via the submission of a form entitled Report on the Filing or Determination of an Action Regarding a Patent or Trademark (AO 120). Plaintiff's counsel is required to fill out and submit this form at the time the complaint is filed.

DATA QUALITY & INTEROPERABILITY

At the Roundtable, data users emphasized the need for cleaner and more complete, valid, and accurate data. USPTO's data suffers not only from omissions and inaccuracies but also from ambiguities. Such obstacles to data quality include the lack of unique identifiers for assignees and inventors.

The USPTO is faced with three significant challenges in improving the quality of its data. First, statutory requirements for the submission of patents make fixes difficult when errors are detected after these have become legal documents. Second, patent applicants are often reticent to provide unambiguous information: there are market incentives to obfuscate data about patent ownership. Third, the process of data cleaning is, in itself, a somewhat subjective one.

An additional challenge is the multiplicity of data models within USPTO, and internationally. This prevents data interoperability, the ability of users to compare U.S. patent data across datasets and with patent data from around the world.

Goal: To make USPTO's data more complete, representative, accurate, and interoperable.

Desired impact: To improve the usability of USPTO's data and reduce the amount of work necessary to clean data for use, including allowing users to better and more easily combine different datasets and variables. This makes it possible for users to analyze and visualize information and develop actionable insights in new, more efficient ways.

PRIORITIES & RECOMMENDATIONS

- Address errors *early* in the patent application process. The USPTO could give an applicant real-time feedback on his or her application, with an incentive for providing correct information such as a faster processing time (or a refusal to process the application unless the information provided is accurate.) An API could provide instant feedback regarding errors at the time of filing, ranging from data placed in the wrong fields to errors in federal contract numbers, location, etc.
- Explore creating a marketplace or crowdsourcing approach for *finding* errors. Spelling errors, information entered in the wrong fields, missing information and other inconsistencies, prevalent throughout USPTO data, making it difficult to harmonize.
- Explore a marketplace also for *fixing* errors. A stop-gap way to improve data quality could be to mirror the data and store a copy of the data in the cloud, updating it periodically (weekly or daily), and correcting it for errors. USPTO could publish corrections (or a certificate of corrections) in machine-readable format.
- Support a legislative change from paper-based or PDF systems to an e-filing system for patent applications: a requirement that they be filed in an all-digital text-searchable format. If the patent bar opposes this change, e-filing could be promoted as a voluntary option for patent applicants. Identify ways to get public/industry support for this.
- Address accuracy issues arising from reclassification of USPTO patents to CPC classifications. While Roundtable participants did not object to the CPC system, they were concerned about the importance of mapping the new classification to old information accurately. USPTO believes the public can be of help, for instance by using crowdsourcing to verify the accuracy of CPC classifications, or by contributing to a glossary project to help translate old classifications to new one.
- Provide a more current registry of active patent attorneys and agents and identify incentives for attorneys to update these records.
- Improve the quality of pre-1970 image data and full-text backfiles.
- Improve bibliographic data to address a common obstacle affecting a majority of data users.
- Address the legislative barriers or other concerns that prevent using potential third-party solutions to data problems. For example, a private company could theoretically clean patent data and donate the improved dataset to USPTO. But if a government agency were to receive such a 'gift' of data, it could give the appearance of the USPTO endorsing a company or favoring it over its competitors.
- Normalize formats for data from different countries (Eg. Canada vs. California).

AGENDA

U.S. Patent and Trademark Office
Open Data Roundtable
Monday, December 8, 2014
USPTO Madison Building – GIPA, Paris/Berne Room

9:00	AM	**Registration**
9:30	AM	**Welcome & Goals of the Day**

Michelle K. Lee
Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director - U.S. Patent and Trademark Office

Lynn Overmann
Deputy Chief Data Officer - U.S. Department of Commerce

9:45	AM	**Structure of the Day**

Joel Gurin
Project Director - Open Data 500, Senior Advisor - The GovLab

10:00	AM	**Presentation of USPTO's Open Data Roadmap and Project Demonstrations**

Alan Marco
Chief Economist - U.S. Patent and Trademark Office

10:40	AM	**Breakout Session 1: Understanding USPTO's Data Customers**
12:10	PM	**Lunch**
1:00	PM	**Breakout Session 2: Responding to the Open Data Roadmap**
2:20	PM	**Break**
2:40	PM	**Breakout Session 3: Brainstorming Solutions**
4:00	PM	**Commitments and Next Steps**

Thomas Beach
Senior Advisor - U.S. Patent and Trademark Office

4:20	PM	**Closing**

Joel Gurin
Project Director - Open Data 500, Senior Advisor - The GovLab

4:30	PM	**Adjourn**

Government Agencies and Offices

U.S. Patent and Trademark Office (USPTO)
The United States Patent and Trademark Office is the federal agency for granting U.S. patents and registering trademarks.

Economics and Statistics Administration (ESA)
The ESA plays three key roles within the Department of Commerce (DOC). ESA provides timely economic analysis, disseminates national economic indicators and oversees the U.S. Census Bureau (Census) and the Bureau of Economic Analysis (BEA). In this latter role, ESA works closely with the leadership at BEA and Census on high priority management, budget, employment, and risk management issues, integrating the work of these agencies with the priorities and requirements of the Department of Commerce and other government entities.

U.S. Department of Energy
The mission of the U.S. Department of Energy is to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions.

Companies, Nonprofit, Academic and Research Organizations

Amazon Web Services
Amazon provides cloud computing services through Amazon Web Services to a range of clients.

American Institutes for Research (AIR)
AIR's mission is to conduct and apply the best behavioral and social science research and evaluation towards improving peoples' lives, with a special emphasis on the disadvantaged.

Center for Knowledge Diffusion (CKD)
The Center for Knowledge Diffusion promotes educational access by reducing barriers to opportunity across five substantive areas: (1) impact analysis of activities related to knowledge diffusion; (2) higher education patenting and licensing activities; (3) talent development; (4) higher education finance as it pertains to student retention and access; and, (5) school policy research.

Code for Northern VA
Northern Virginia locals helping Arlington County, Alexandria City and other Northern Virginia municipalities open their data and create meaningful web and mobile apps

Collective IP
Collective IP is a comprehensive business intelligence platform for discovering and analyzing technologies emerging from universities, companies and inventors.

Columbia University
Columbia University seeks to attract a diverse and international faculty and student body, to support research and teaching on global issues, and to create academic relationships with many countries and regions.

Computer Packages Inc (CPI)
Computer Packages provides Patent and Trademark Intellectual Property Management Systems and Patent Annuity Payment Services. CPI helps reduce the cost of patent, trademark and annuity management.

Enigma

Enigma is a platform that centralizes, mines and relates big public data about companies, people and locations. It draws together sources as diverse as SEC filings, government spending contracts, liens, patents, asset ownership, bills of lading, and more.

Georgia Institute of Technology
Georgia Tech is a science and technology-focused learning institute renowned for a deeply-held commitment to improving the human condition.

Google
Google's mission is to organize the world's information and to make it universally accessible and useful.

IBM
IBM is an international technology and consulting company.

IFI CLAIMS Patent Services
IFI's databases include chemical and biological indexing, US patent assignee name standardization, 'probable' assignee name additions on US published application records, calculated expiration dates, and class code updates on all patent records. IFI also offers comprehensive US patent legal status information, including ownership changes.

IP.com
IP.com is an intellectual property solutions provider that helps organizations make complex business decisions around their innovations.

The Patent Board
The Patent Board helps clients unlock the value of patent assets to increase performance, improve profits, gain knowledge, identify opportunities, research competitors, and pursue the right investments.

Patent Information Users Group (PIUG)
The objective of PIUG is to create a forum to discuss issues and concerns relevant to the patent searcher community. The group promotes the importance of intellectual property, especially patent publications, and most specifically, the computerized patent databases.

Reed Technology
Reed Technology, a LexisNexis company, is a leader in electronic content management services, including data capture and conversion, e-submission and publication.

Thomson Reuters
Thomson Reuters is a leading source of information for businesses and professionals.

Trea
Trea is a service where people can analyze relationships between innovation stakeholders and map ideas to the unified knowledge graph.

University of NC at Charlotte
University of NC at Charlotte is a public research university located in Charlotte, North Carolina.

University of Missouri School of Law
A national leader in the field of dispute resolution, University of Missouri School of Law seeks to complement a strong traditional curriculum with an orientation toward lawyering as a problem-solving endeavor.

Way Better Patents
Way Better Patents chronicles the latest developments in intellectual property, innovation, inventions and patents (I3P) and the emerging innovation economy.

OPEN DATA ROUNDTABLE SERIES SPONSORS

Amazon Web Services offers a broad set of global compute, storage, database, analytics, application, and deployment services that help both large enterprises and start-ups move faster, lower IT costs, and scale applications. Amazon Web Services Worldwide Public Sector is helping government and education customers§ employ cloud services to reduce costs, drive efficiencies, and increase innovation across the globe. Public Sector organizations of all sizes use AWS to build applications, host websites, harness big data, store information, conduct research, improve online access for citizens, and more. *For more information, see aws.amazon.com/gov*
http://aws.amazon.com/gov

PricewaterhouseCoopers is a network of firms in 158 countries that delivers quality in assurance, tax and advisory services. PWC helps federal agencies meet the challenge of integrating financial and performance systems to help make decisions and improve accountability. Clients look to the PricewaterhouseCoopers Public Sector Practice to bring direct hands-on knowledge of federal standards for systems, internal controls, and financial reporting. The Practice assists clients through creating interactive data, developing an agile reporting and analytic framework, and identifying and implementing improvements to the data and information supply chain. *To find out more, visit www.pwc.com/publicsector.*