Tamr

CASE STUDY

Air Force SEEK EAGLE Office and Tamr Expedite the Air Force's Mission Capabilities

Turning Historical Documents Into Tomorrow's Insights

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Customer:

United States Air Force
SEEK EAGLE Office

Use case: Public sector

Challeneges

- Disparate, siloed data prevented AFSEO from utilizing it to quickly certify new stores
- More than 131TB of data lacked metadata
- Meeting an increased workload with budget, personnel and tool constraints
- Training new engineers and analysts was laborious and didn't scale

Outcomes

- Reduce the store certification research to minutes by better using historical data
- Organized and tagged thousands of files using natural language processing, machine learning, and intelligent metadata processing
- Improved aircraft by increasing the range of stores they can carry
- Increased efficiency of AFSEO's engineers and analysts
- Substantial cost savings by keeping analysis in AFSEO instead of contracting aircraft manufacturers

Overview

The United States Air Force SEEK EAGLE Office (AFSEO) is the USAF center of excellence responsible for managing the aircraft store compatibility process. These "stores" can include sensors, weapons, electronic warfare (EW) pods and a variety of other aeronautic devices which can (catastrophically) affect the aerodynamic characteristics of the aircraft. AFSEO must efficiently evaluate new stores configurations' impacts to performance and safety prior to the stores use in the field.

Tamr accelerates time to insights for the public sector by automating entity resolution, record deduplication and categorization. Tamr's data mastering solutions combine machine learning-based models and human feedback to quickly and easily integrate historical data, test data, and unstructured reports into a common framework.

The challenge

For over 30 years, the engineers at AFSEO have been conducting research, testing, and analysis of stores to ensure compatibility and interoperability in different flight conditions. This considerable data is distributed across silos that are difficult to search and are curated inadequately for the mission. This data is in a variety of mediums that are both structured and unstructured. As a consequence, the data is not used to its full potential and takes significant time to ascertain pertinent information about each store.

AFSEO also needed a more structured way to train new engineers and enable them to find this historical data more efficiently. The traditional process of searching different data silos and accessing resident knowledge of veteran engineers was laborious and could not be sustained. AFSEO contends with constraints around personnel availability, tools, and flight test

Using Tamr substantially reduces the manual workloads of AFSEO engineers, who in the past had struggled to find relevant test information and certifications for new stores.

budgets all while anticipating a workload increase of more than 50 percent year-over-year. AFSEO needed to couple the consolidation of their data infrastructure, their search capabilities of that infrastructure, and "encode" their engineers' knowledge in a machine learning system that expeditiously met the mission requirements.

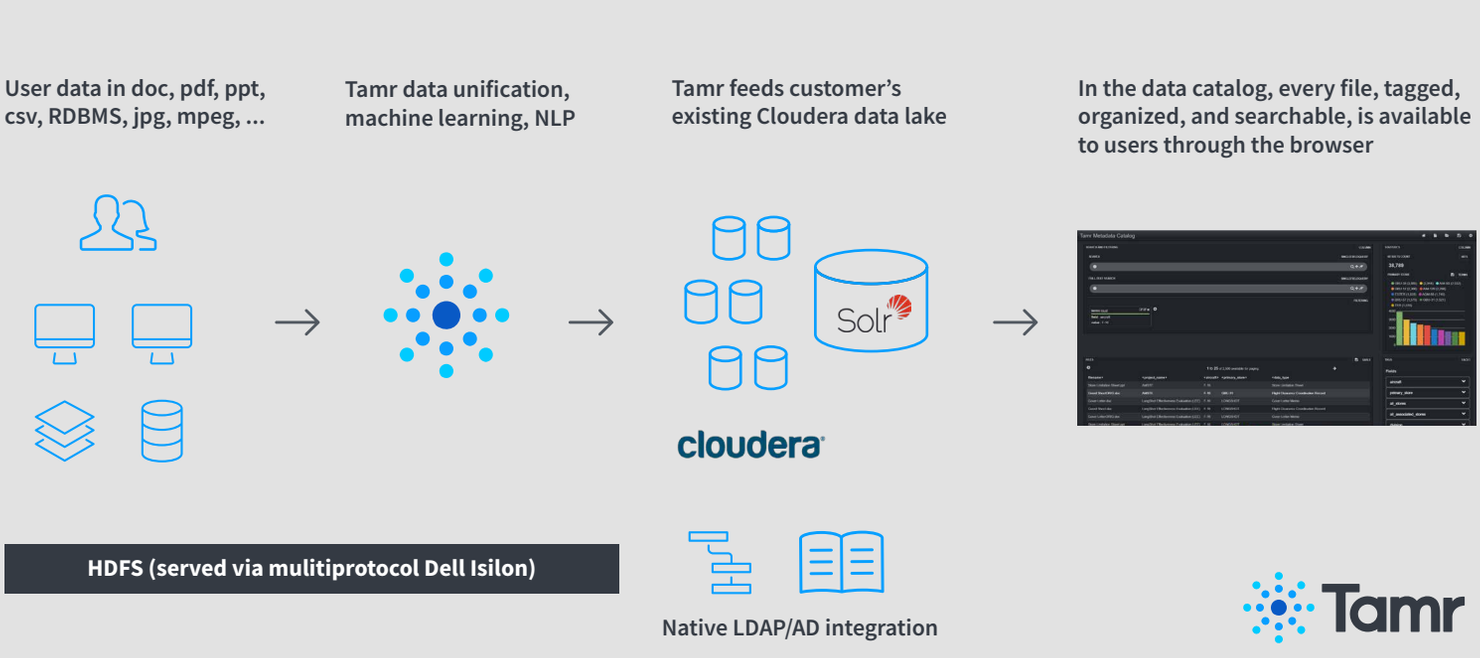
AFSEO turned to the Defense Innovation Unit, the Department of Defense organization focused exclusively on fielding and scaling commercial technology across the U.S. military at commercial speed, to find and prototype a technology that used machine learning to analyze data sets and then use data analysts to fine tune the analysis. DIU's process led AFSEO to Tamr, a company with significant experience refining data utilization and analysis across the Department of Defense, U.S. Federal Government and for Fortune 1000 companies.

Technical solution

AFSEO utilizes Tamr to mine the technical content in historical documents using their machine learning software and technical expertise. Tamr uses natural language processing, machine learning, and intelligent metadata processing to organize and tag these files, creating 4.4 billion tags of "metadata" covering 22 kinds of information. These techniques allow Tamr to extract the subject of a file, authorship and ownership, core topics, key references, and find connections between documents.

When new stores are submitted for clearance, Tamr looks through historical documents for analogous configurations. Using its data mastering and machine learning capabilities, Tamr can pick just the right documents from the millions that exist. The historical analogs are used to predict whether a new store is safe for use on the aircraft. Tamr not only makes a recommendation, it cites its sources, just like a human analyst would. Tamr then pushes these tags to AFSEO's Cloudera-based data lake for intuitive search and filtering. AFSEO end users interact with Apache Solr™ via a browser-based application called Banana. Tamr is easily able to thrive in an open ecosystem with best of breed components such as Solr™ and Banana. This iterative process allows AFSEO to expedite the prediction of whether a new store is safe and will perform to their standards based on previously approved stores.

Using Tamr substantially reduces the manual workloads of AFSEO engineers, who in the past had struggled to find relevant test information and certifications for new stores. Tamr accelerates the insight into this data enabling the U.S. Air Force to deploy the latest technology safer, more efficiently, and expand mission capabilities.



Tamr quickly picks the right documents out of the millions in the database within seconds.

Tamr makes recommendations, with cited sources, like a human analyst would.

Business outcomes

With Tamr, the AFSEO quickly finds relevant antecedents that support the engineering decisions to protect pilots and aircraft as well as meet the evolving mission. As the AFSEO continues to use Tamr, the solution's machine learning capabilities will help the office better leverage its data at "keystroke speed" while allowing engineers and analysts to handle the increased workload at decreased costs.

Project Objectives

- Tag every file (more than 131TB of data) at the AFSEO with relevant descriptive words
- Expedite the hundreds of requests made annually to the AFSEO
- Reduce report generation to minutes as opposed to months
- Provide a searchable, interactive data catalog to users that puts every file within easy reach
- Given a new store or configuration, suggest the correct historical documents, analyze them, and predict whether they are sufficient for a "by analogy" certification.

Results

- Increased ROI and utilization of Air Force aircraft
- Increased efficiency of AFSEO engineers and analysts
- Significant reduction in spend by reducing reliance on aircraft manufacturers and lengthy store testing
- Weeks saved per request, as a first draft report that takes a human weeks or months can be generated in seconds
- 61,000 files tagged to date with over 1.1 million descriptive tags of 22 types
- Greater than 76% recall and specificity for predicting unsafe wing vibrations using machine learning

Hear AFSEO's CDO share how Tamr accelerated and automated the process of recommendations for new flight configurations.

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About Tamr

Tamr and through its subsidiary, Tamr Government Solutions, is the leading data mastering company that accelerates data-driven business outcomes for large organizations. Public sector leaders like: U.S. Department of Homeland Security, U.S. Army, U.S. Office of the Secretary of Defense, U.S. Air Force and U.S. Navy trust Tamr to manage their enterprise data as an asset. Tamr's unique approach of using human-guided machine learning algorithms to accelerate data mastering projects lets the world's largest organizations enhance their data operations, rapidly activate latent data, and increase the velocity of business outcomes through data-driven insights. With a co-founding team led by Andy Palmer (founding CEO of Vertica) and Mike Stonebraker (Turing Award winner) and backed by investors including NEA and Google Ventures, Tamr is transforming how companies get value from their data.

To find out more, visit **www.tamr.com/public-sector**