



I N S T I T U T E F O R D E F E N S E A N A L Y S E S

**Options to Use Artificial
Intelligence (AI) in Assessment of
Defense Acquisition Programs
(Conference Briefing)**

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About This Publication

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Executive Summary

This briefing presents the findings from a feasibility study, sponsored by the Office of the Assistant Secretary of Defense for Acquisition, on applying artificial intelligence (AI) and related tools to help assess defense acquisition programs. The objective of this project is to identify options to streamline processes, enhance predictive power, and better and more efficiently inform senior decision makers of trends and possible outcomes. The Institute for Defense Analyses engaged with acquisition staff who assess programs, identified AI activities in industry where unstructured data have been used to measure performance, and analyzed options to use AI to help assess acquisition programs. We identified several options to apply text analytics to unstructured data on major defense acquisition programs. Our study results suggest that the most promising option is to use tools such as sentiment analysis and topic models to rank documents according to how relevant they are to an analyst. This ranking would enable analysts to start reading the most relevant information instead of having to search through a large set of data.

Options to Use Artificial Intelligence (AI) in Assessment of Defense Acquisition Programs

Kristen Guerrero
Brian Rieksts

- Objective
 - Feasibility study for how AI could be applied to
 - Streamline processes
 - Enhance predictive power for program assessment
 - Inform senior decision makers of trends and outcomes
- Statement of work
 - Describe AI activities in industry where unstructured data have been used to measure performance
 - Engage with acquisition staff who assess programs
 - Apply AI tools to acquisition data

IDA | Potential Opportunities

- Consume more data than a single person
 - Prioritize documents for review
 - Improve efficiency
 - Utilize previously untapped data
 - Predict program outcomes
 - Identify correlations across data in different functional areas
- Streamline processes
 - Extract metadata
 - Identify changes in acquisition documents
 - Estimate if document is ready for approval

IDA | Congressional Testimony

Navigational Tool

IDATA

IDA Text Analytics

[Home](#) | [Saved Cases](#) | [Manual](#) | [Login](#) | [User: guest](#)

Saved Cases > Case: Policy-Lake > Explore

Current Selection

remove all
(x) edit) "F-35"
(x) topfolder:"/hasc" OR topfolder:"/sasc"

Search

(Help)

Append Current Query (More info)

Saved Queries: USING TEXTBOX TO TYPE QUERIES

[batch search](#) (Select Multiple Saved Queries)

[collapse all](#)

Top Discovered Keywords –

Preferences+

Export Results | View Bookmarks

Previous | Page 1 of 8 | Next | Displaying 1 to 50 of 367 | Sort by: default

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File Info: pdf, report

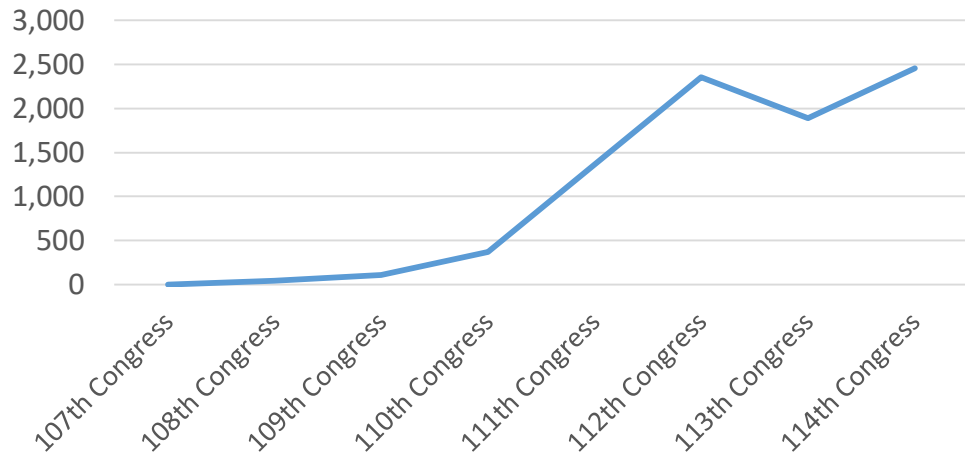
Keywords: f35 program | marine corps | tactical air | land forces | f35 joint | air force | program office | fiscal year | ranking member | operational test | admiral winter | niki tsongas | deputy commandant | states navy | repair capacity

Num. Equations: 0

Possible Office Mentions: Secretary of Defense | Defense Contract Management Agency | Defense Courier Service | Secretary of the Air Force | GAO

i [H.A.S.C. No. 11579] THE F35 JOINT STRIKE FIGHTER LIGHTNING II PROGRAM HEARING BEFORE THE SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES ONE HUNDRED FIFTEENTH CONGRESS SECOND SESSION

Mentions of F-35 in Testimony



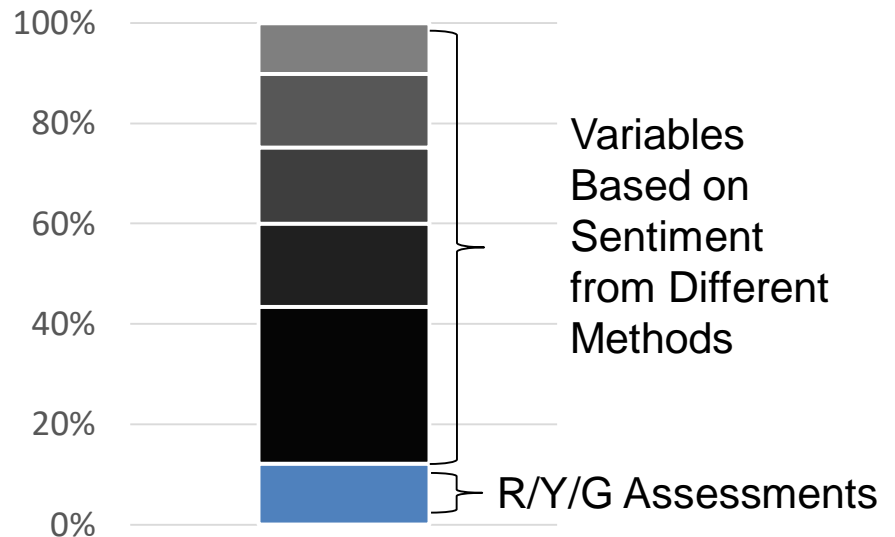
IDA | Predicting Program Outcomes

- Structured and unstructured data could be used to predict program outcomes (e.g., cancellation, schedule slip, cost growth)
- Ranked list of programs or documents for further investigation

Example model

- Forecast based on DAES assessments
 - Sentiment of narrative assessments
 - R/Y/G assessment
- Predict outcome of Nunn-McCurdy Breach or Cancellation
- Machine learning (gradient boosting)

Relative Contribution of Variables to the Model

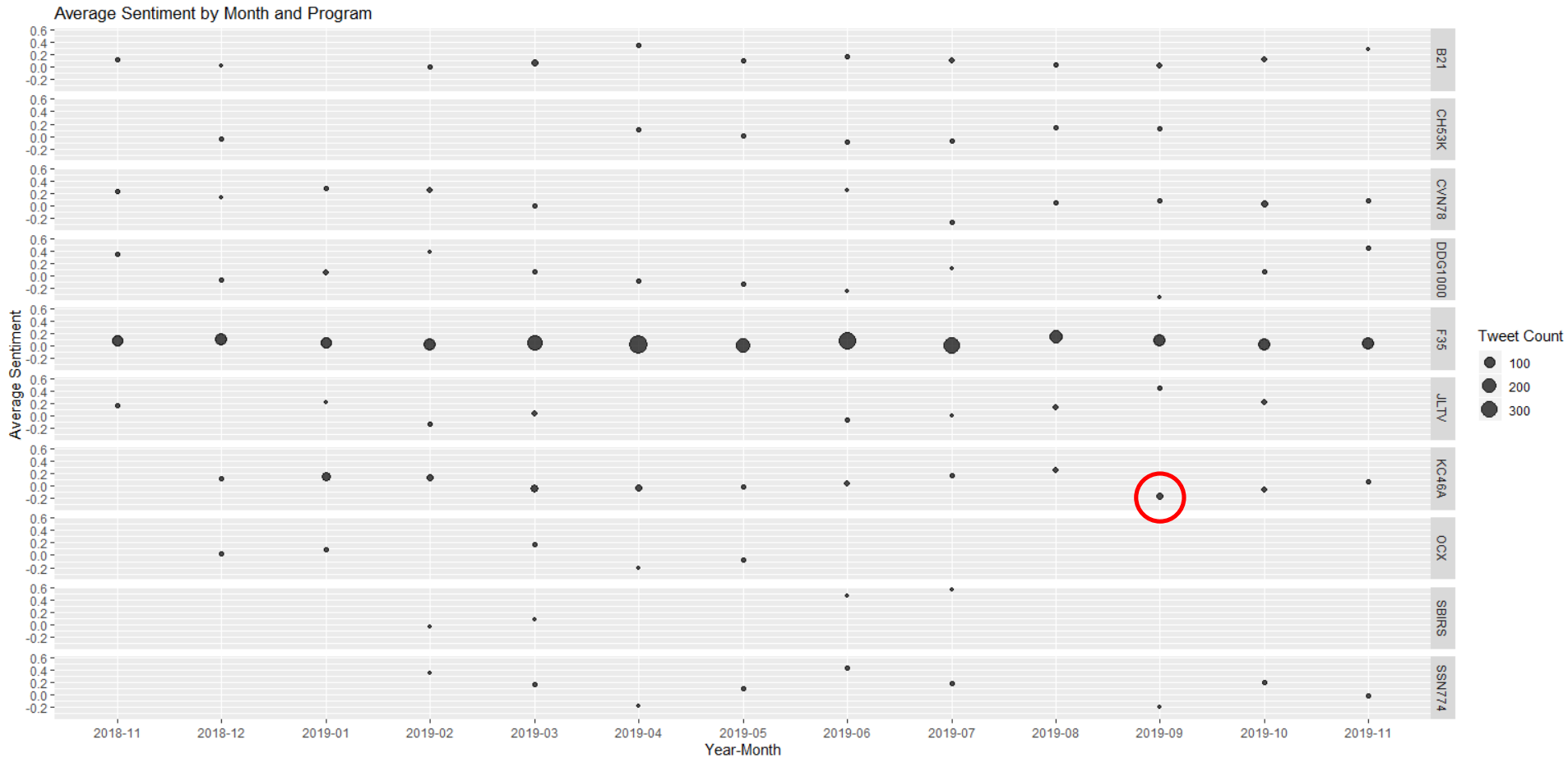


IDA | Program Office Emails

- Program office emails are another potential source of data on acquisition programs
- KeenCorp is a Netherland-based data analytics company that measures employee sentiment
 - Identified issue in Enron emails 2 years before they declared bankruptcy
 - Does not report information at the individual level
- Other analytic companies
 - Perform organizational network analysis on email metadata
 - Track sentiment internally
- Anonymous text such as surveys or whistleblower data could be analyzed

IDA did not consider any legal issues

IDA | Twitter Sentiment: Average Sentiment by Month and Program



IDA | KC-46A Tweets in Sept 2019



Valerie Insinna ✓
@ValerieInsinna

SCOOP: The Air Force has indefinitely restricted the KC-46 from carrying cargo and passengers due to issues with cargo restraints on the floor of the aircraft becoming unlocked:



US Air Force restricts KC-46 from carrying cargo and passenger...
The KC-46 has added another critical deficiency to the list, and it's the most serious problem yet.
[defensenews.com](https://www.defensenews.com)

7:08 PM · Sep 11, 2019 · [TweetDeck](#)

111 Retweets 132 Likes



Inside Defense
@insidedefense

AMC chief not satisfied with [@Boeing](#)'s progress on KC-46 remote visions system.



AMC chief not satisfied with Boeing's progress on KC-46 remo...
The Air Force has withheld approximately \$532 million from Boeing on the 19 KC-46 tankers the contractor has delivered ...
[insidedefense.com](https://www.insidedefense.com)

3:14 PM · Sep 19, 2019 · [Hootsuite Inc.](#)



Anthony Capaccio ✓
@ACapaccio

We break: Besides KC-46 tanker problems, here's another big AF program Boeing is having issues w: A \$2.8 billion Boeing upgrade of its Awacs surveillance planes is being dogged by delays
[bloomberg.com/news/articles/...](https://www.bloomberg.com/news/articles/...) via [@business](#)



Boeing's \$2.8 Billion Awacs Plane Upgrade Slowed by Lab Closings
A \$2.8 billion Boeing Co. upgrade of its Awacs surveillance planes is dogged by delays caused in part by an almost yearlong closing of two classified laboratories...
[bloomberg.com](https://www.bloomberg.com)

9:27 AM · Sep 30, 2019 · [Twitter Web Client](#)

34 Retweets 34 Likes

IDA | Other Possible Opportunities

- Extract metadata from documents
 - Air Force has explored identifying metadata from unstructured information in contracts
- Predict if a document is ready for approval
 - Private sector uses text analytics to assist in reviewing legal documents
- Identify changes in documents
- Explore different datasets
 - Program Assessment Reports (PARs)
 - Earned Value Format 5 data

IDA | Path Forward

- Engage with acquisition staff on simple prototypes
- Use an iterative approach with feedback from acquisition SMEs
- Contact information

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