

## PROBLEM STATEMENT

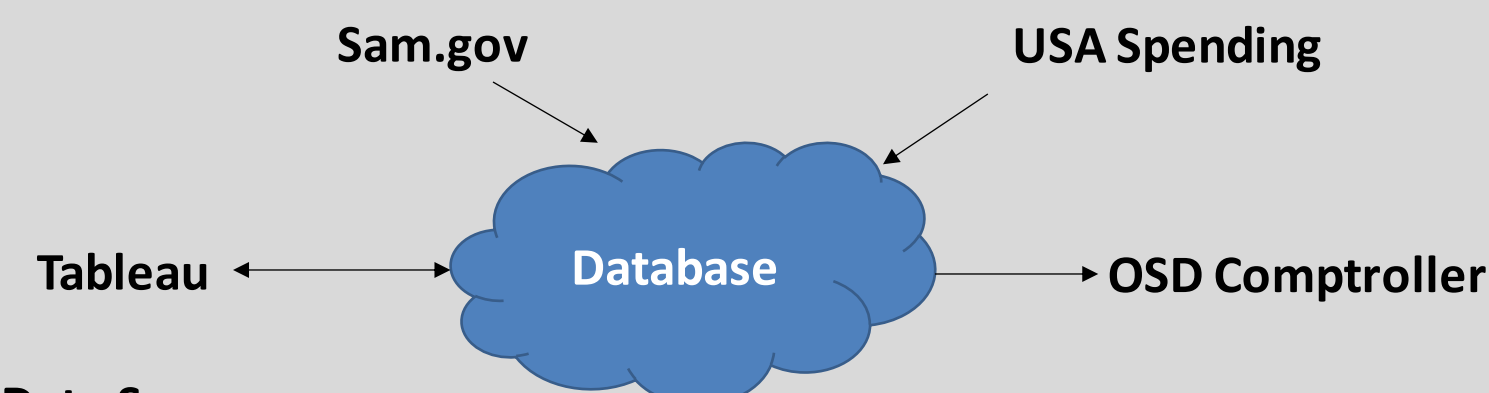
**Goal:** Build a Dashboard in Tableau to convey business intelligence to Raytheon stakeholders.

**Problem:** Bulk data on government spending, contracts, and topline expenses exist but are unstructured, spread across multiple platforms, and conflicting. How can Raytheon leverage this data and make sure they are not missing out on any opportunities?

**What we did:**

- Explored trends in Defense spending by looking at aggregated defense spending by "color of money".
- Explored spending by sub-tier (Army, Navy, Air Force).
- Examined contract level spending for the Blackhawk helicopter and V22 Osprey and forecasted spending.

## METHODS AND DATA



**Data Sources:**

1. Sam.gov - future opportunities
2. Usaspending.gov - contract level spending
3. DoD comptroller data - top-line overview of government spending broken down by "color of money" (RDTE, O&M, Procurement).

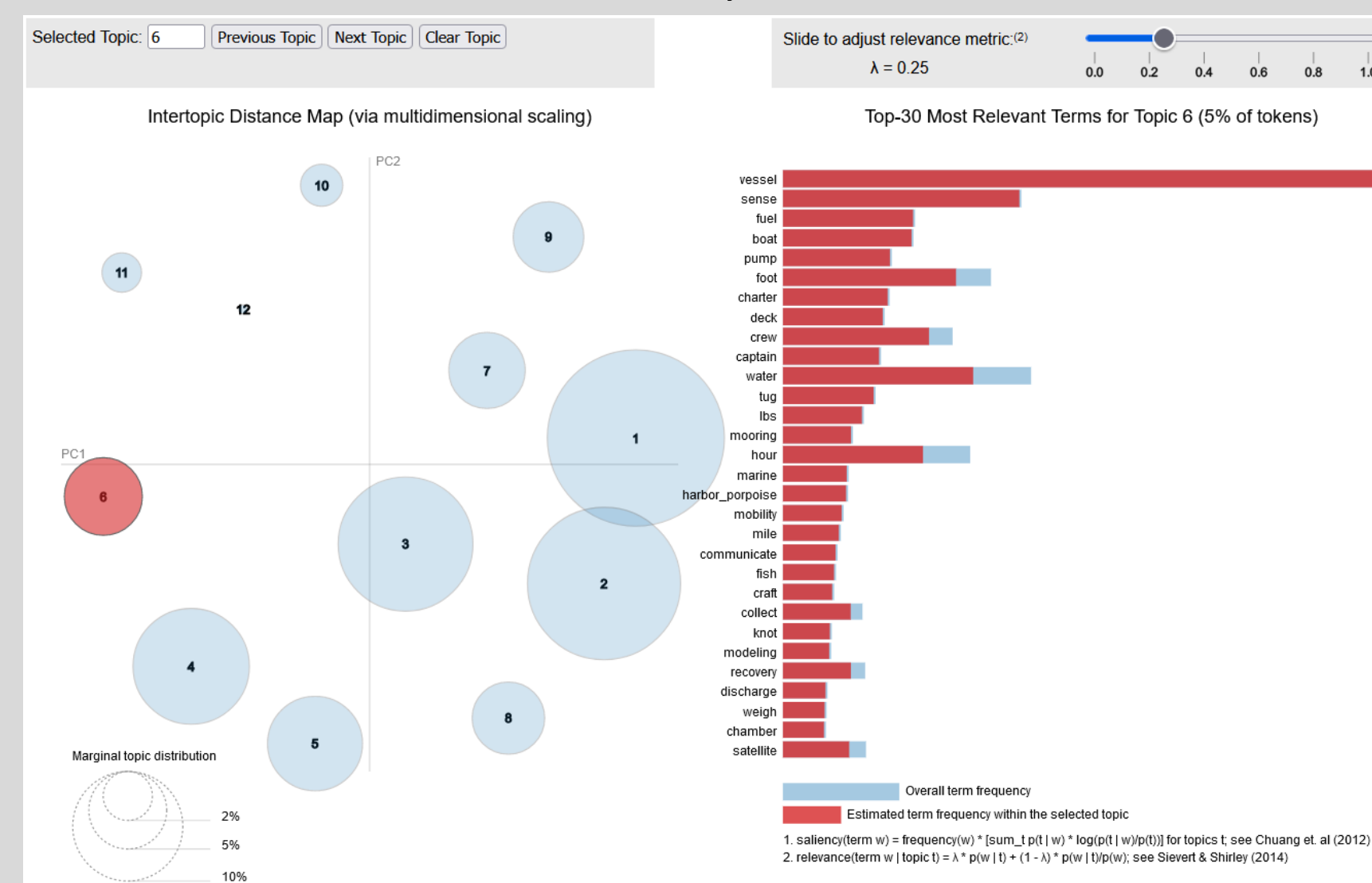
**Methods:**

- Topic Modeling (Exploratory)
- Machine Learning (Prediction)

## ANALYTICS (ML + NLP)

**Data:** SAM.gov Navy solicitations in 2019 related to radars.

**Goal:** Summarize Navy solicitations.



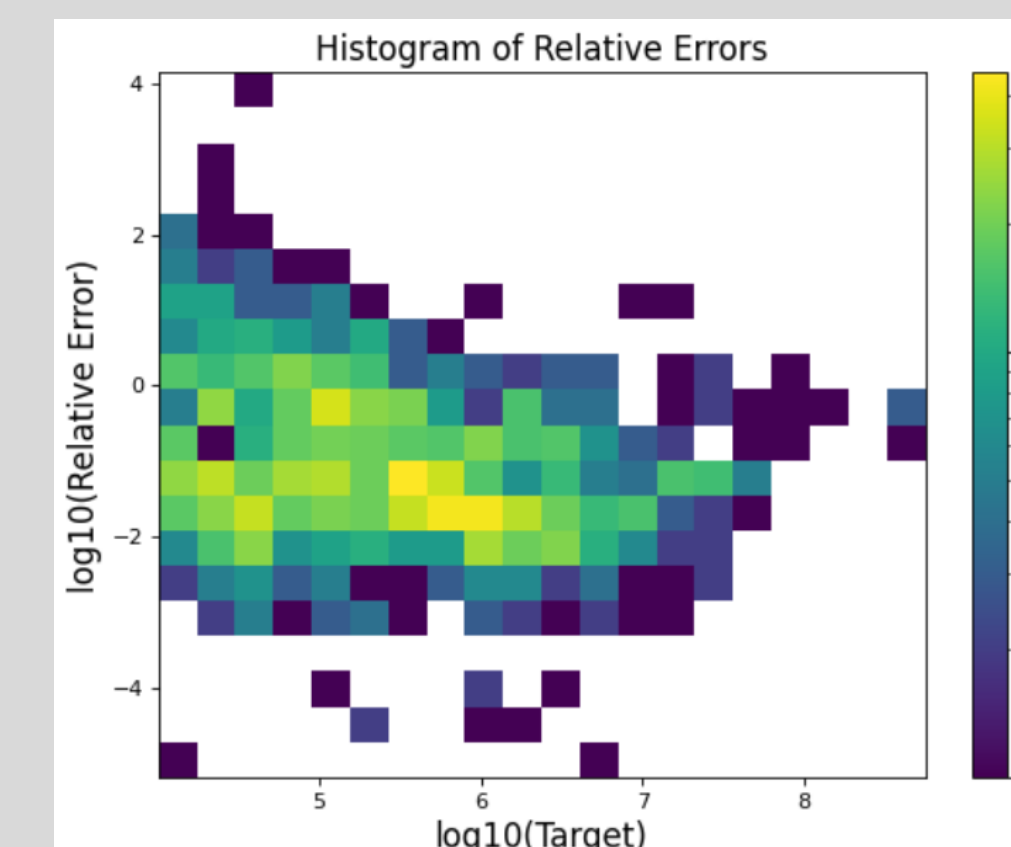
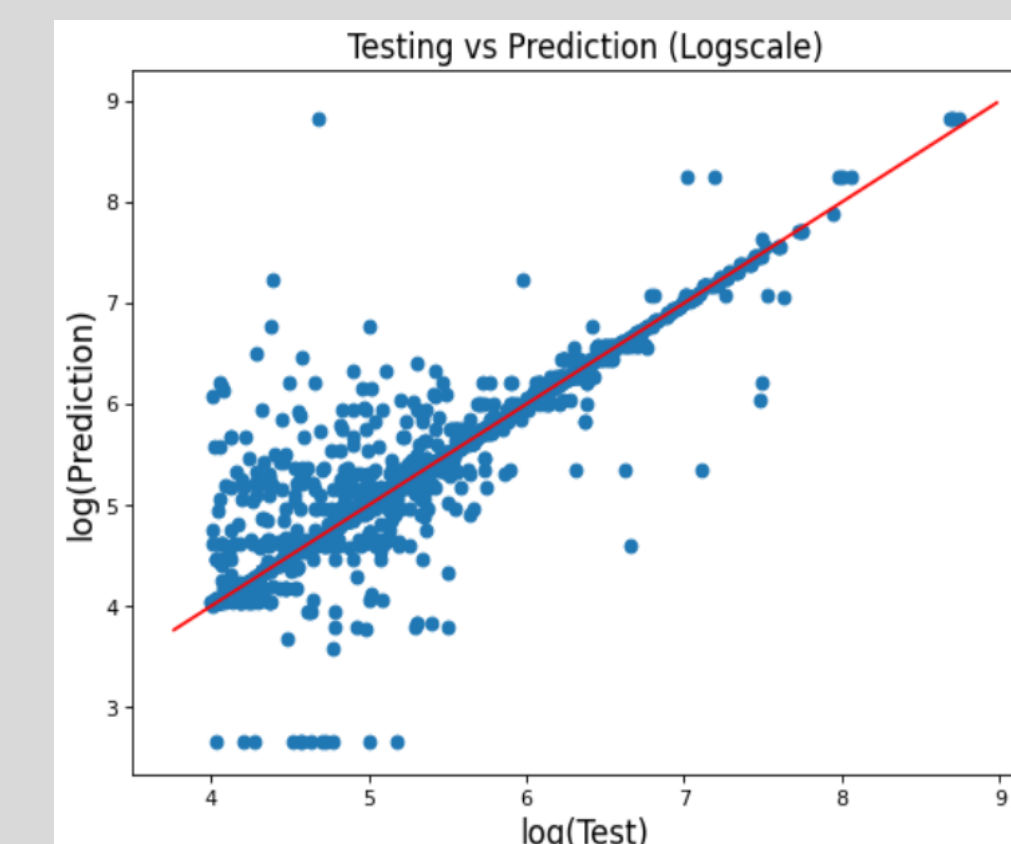
**Findings:**

**Topic Modeling (LDA)** too broad unless we did very targeted analysis. May need a temporal aspect to get novel business intelligence out of it.

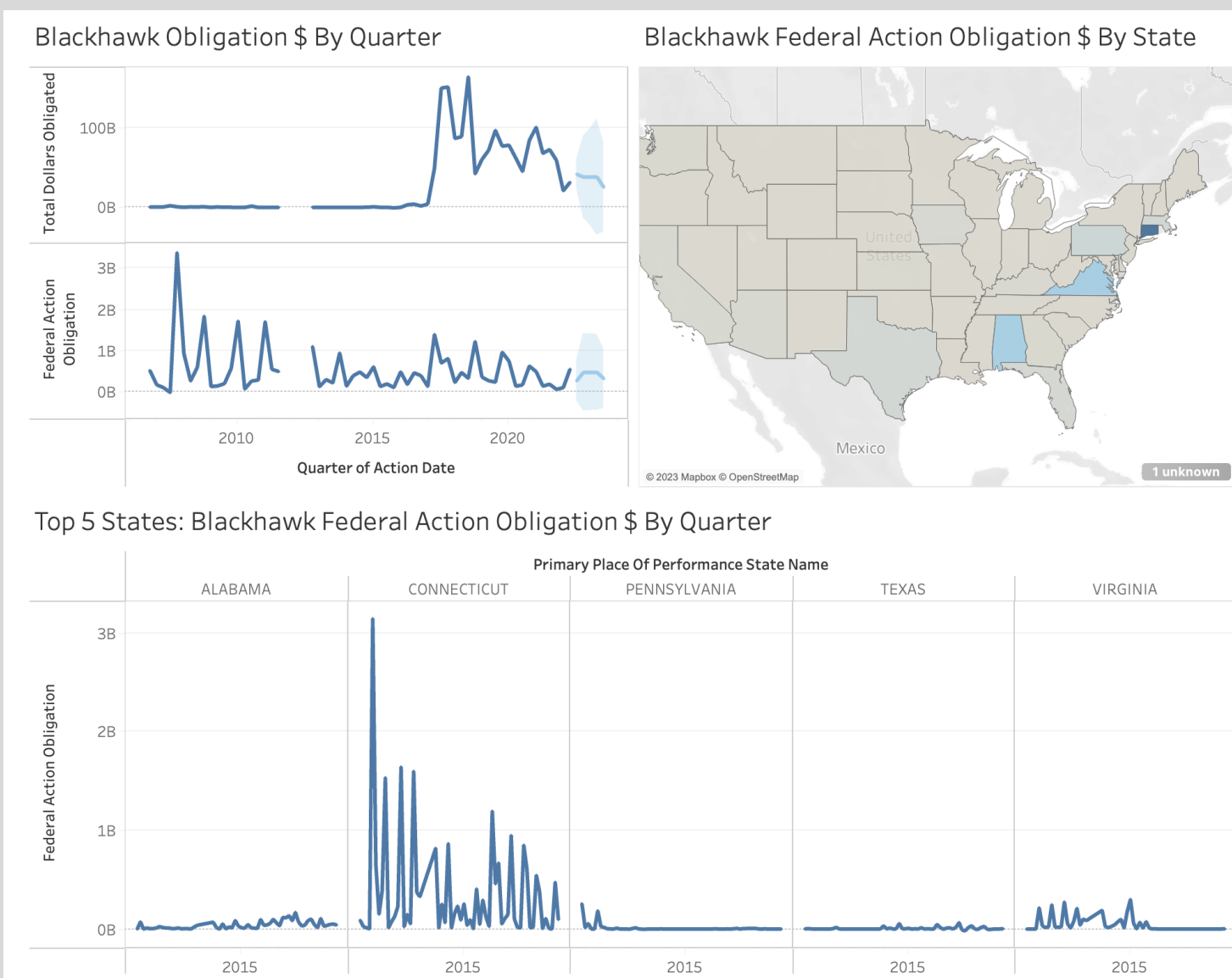
**Predicting blackhawk spending** performs much better for larger contracts (less variance and smaller relative error) but that data is much sparser. Need to forecast future spending to realize financial value.

**Data:** usaspending.gov (contract level spending) for blackhawk helicopter spending over \$10,000.

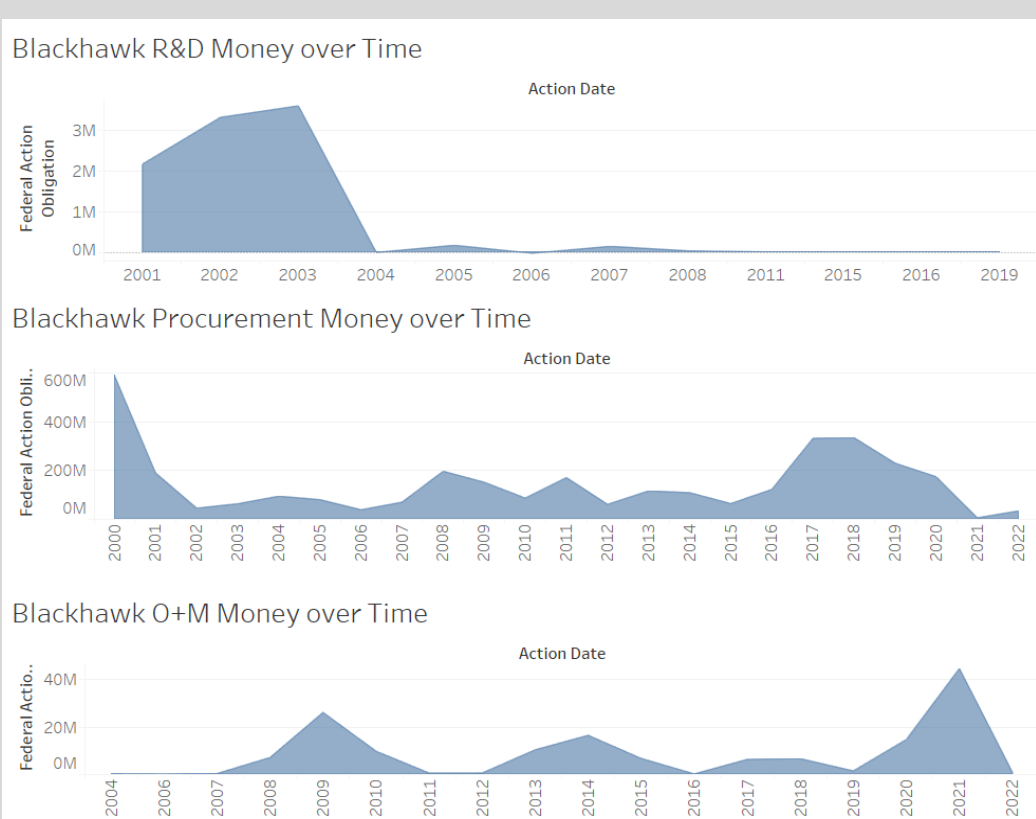
**Goal:** Predict spending using other features



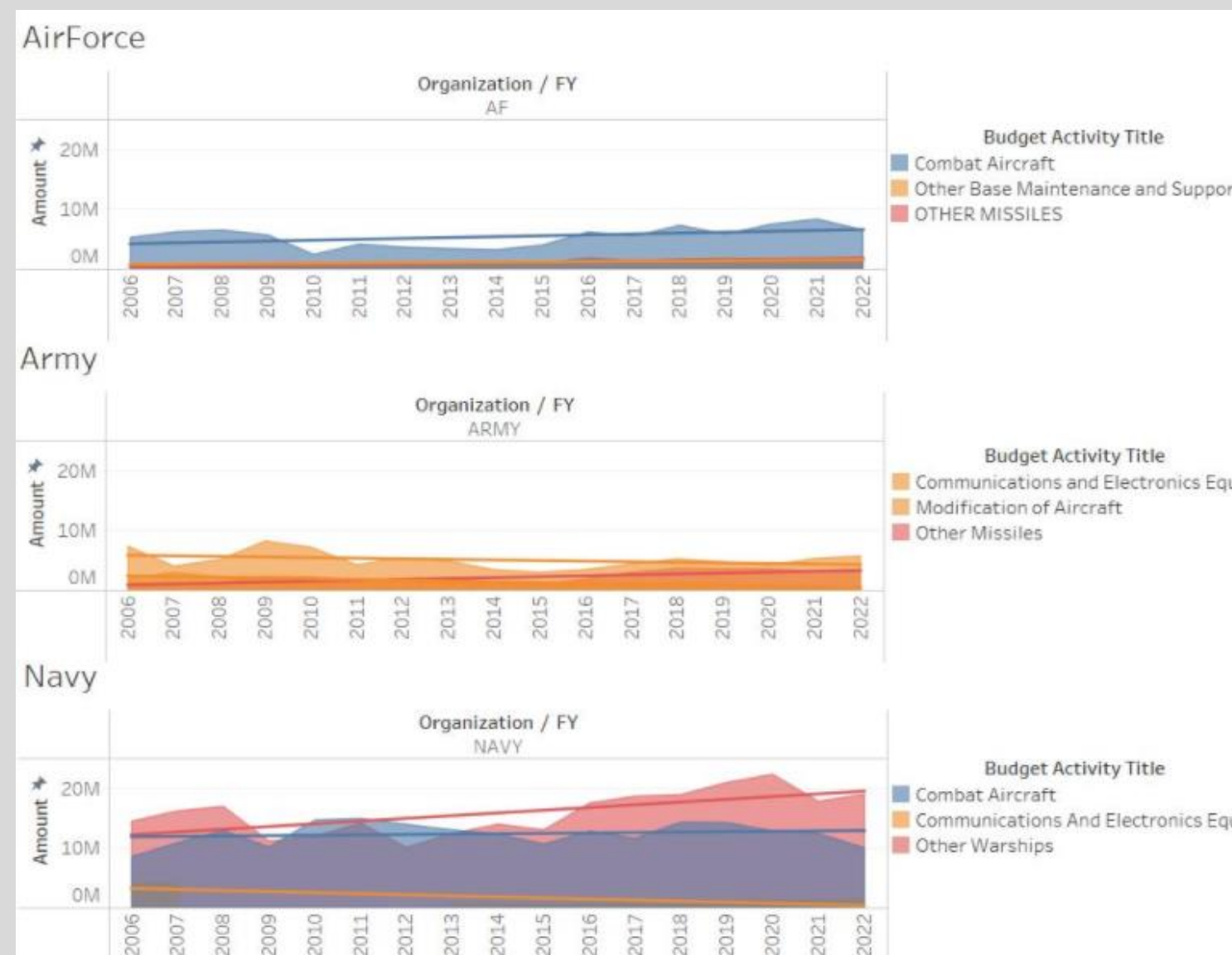
## INSIGHTS IN TABLEAU



- 3 quarters forecast for Blackhawk spending
- Highest spending are states in dark blue
- Top 5 states spending by quarter 2010-2022



- Small initial investment for Blackhawk modifications
- Spikes in procurement for new models, larger sums of money compared to RDTE
- Peaks not consistent with team's understanding of operations and maintenance (O+M) obligations



- Over 16 years, we show trend lines estimating Procurement spending by sub-tier (AF, Army, Navy) as well as the top 3 expenditures.
- We find that "Combat Aircraft" and "Communications and Electronics" have the largest spending.

## FUTURE WORK

**NLP: Information Extraction**

Defense spending on research and operations (RDTE and O&M) is often intentionally obfuscated. Using NLP and more specific DoD agency documents, can we figure out what technologies are winning the majority of the RDTE and O&M spending? This data is spread across multiple systems and is unstructured.

**Forecasting:**

Can we extend this forecasting to more weapons systems? Say the V-22 or F35? Moreover, can we forecast by type of spending? O&M spending accounts for about 40% of the DoD budget. Can Raytheon get a bigger piece of this pie?

**Targeted BI:**

Can we find contracts that are "behind schedule" or have a surplus of funds available? If we can, Raytheon could potentially subcontract for those awards.

## ACKNOWLEDGEMENTS

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