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A Data Analytic Environment to Enable Senior Leader Decision Support – United States Central Command Use Cases

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DoD Data Strategy

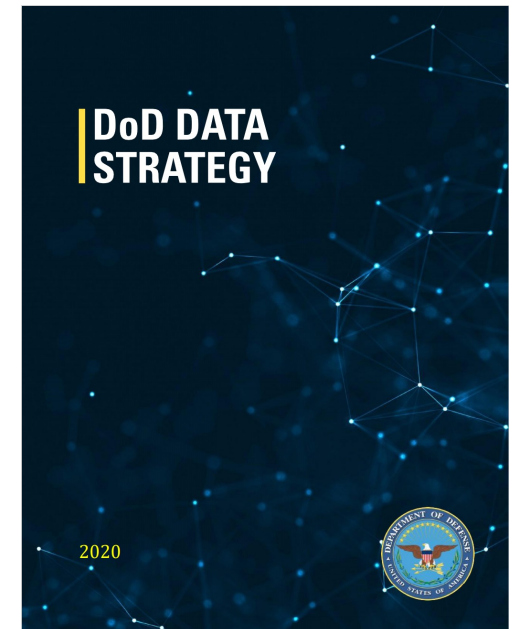
Published by DoD Chief Data Officer on 30 September 2020 and signed by Deputy Secretary of Defense

DoD Vision:

DoD is a data-centric organization that uses data at speed and scale for operational advantage and increased efficiency.

DoD Data Strategy initial areas of focus:

- *Joint All Domain Operations*
- Business Analytics
- Senior Leader Decision Support
- *“accelerate the Department’s transition to using live, interactive data in place of static slides to inform strategic outcomes”*





Vision

Automated data integration and analysis to support faster and better operational decision making

Dashboards

Digital Maps

User Defined Views

Map Drilldown

Heuristics

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New Data Sets

Predictive Simulation

Statistical Analysis

Optimization

Text Mining

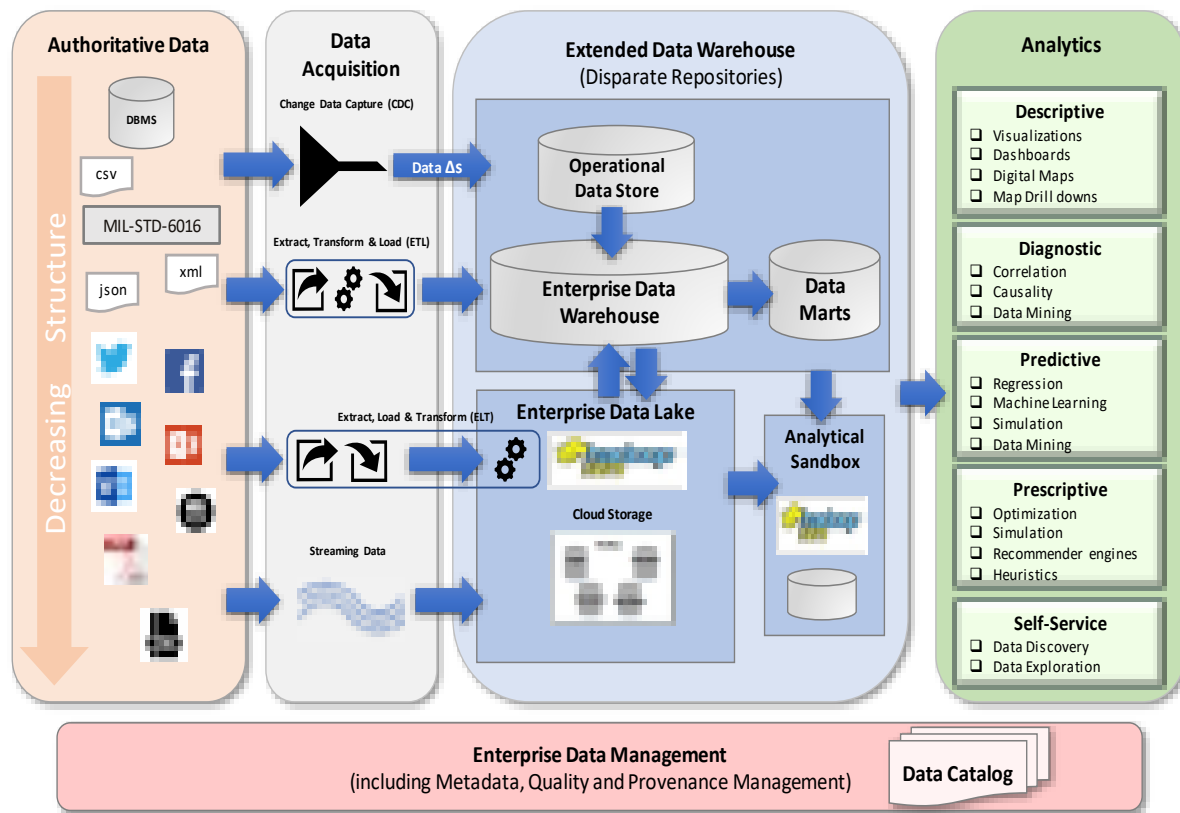
Machine Learning

Trend Analysis

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Data Analytic Environment (DAE) to Enable the Vision



Five Approaches to a DAE

1. Adopt Government-owned capabilities
 - e.g., NRO FADE, AF UDL, DIA CDF, AF C2IE
2. Adopt specialized commercial products endorsed by other Government agencies
 - e.g., esri / ARC GIS (used by IC, USTRANSCOM, USNORTHCOM)
3. Build directly on a Cloud Service Provider
 - e.g., AWS, Azure, Google Cloud)
4. Use commodity or open-source desktop commercial products
 - already on SIPR at USCENTCOM or elsewhere
 - e.g., MS PowerBI, MS EXCEL, MS MYSQL, Tableau, R Shiny
5. Establish and integrate a hybrid solution
 - assumed to be the long-term solution

Exploratory Prototyping Starting Point



Use Case

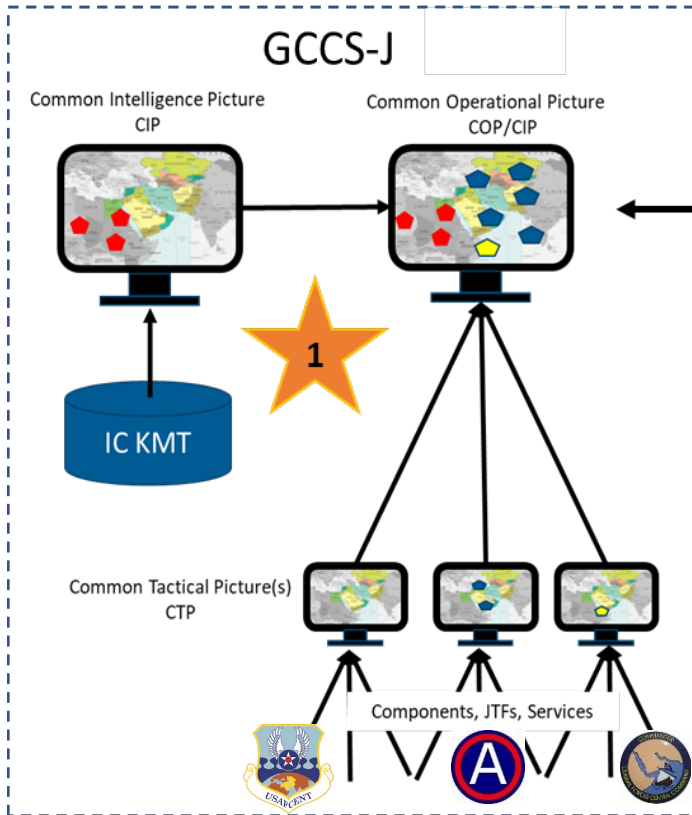
JOINT OPERATIONS CENTER (JOC)



How the JOC Works Today: All Domain SA Production

J3:

- Not just "What" but "So What" and "What's Next"

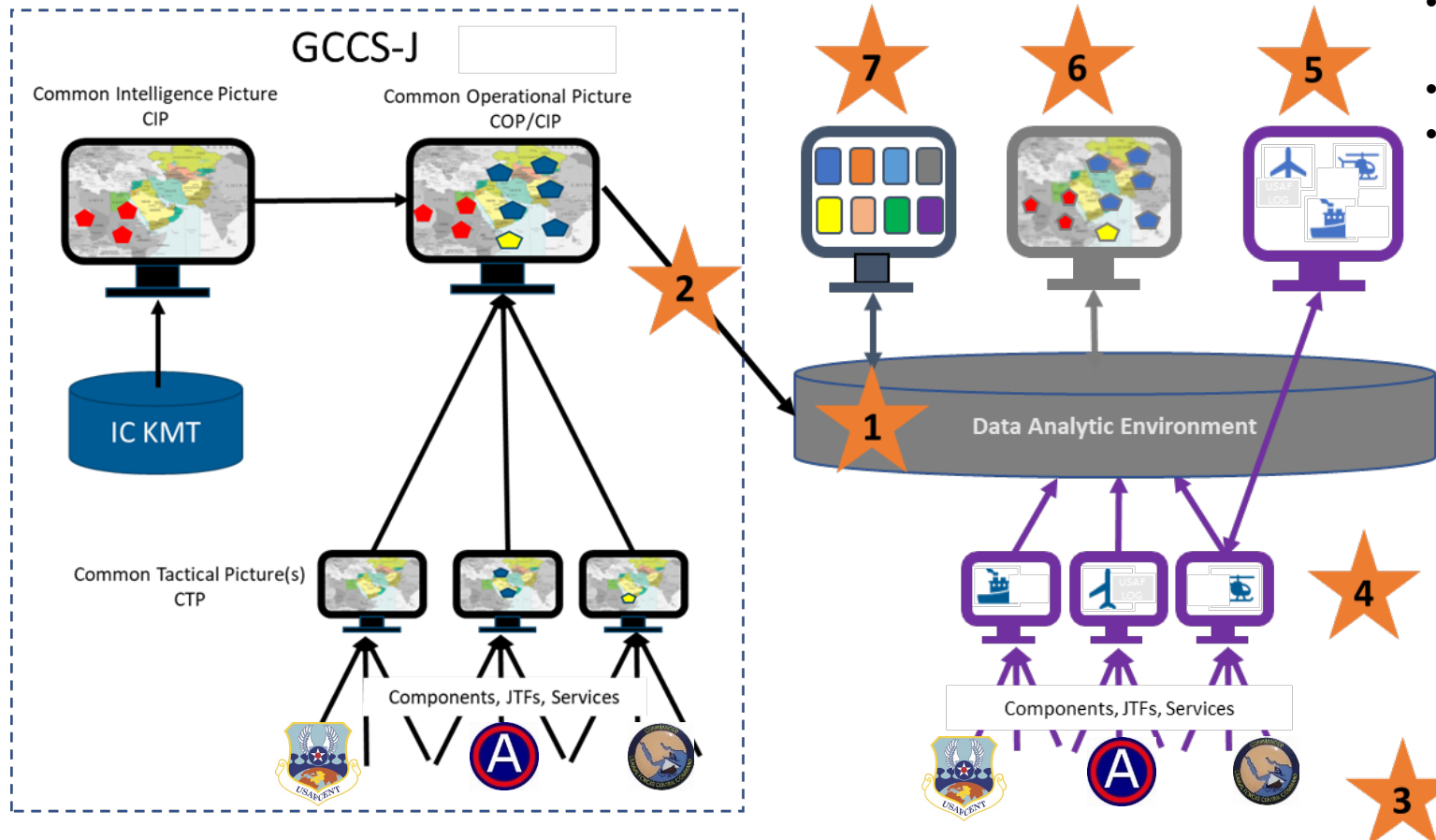


Logistics, Fires, Electromagnetic Warfare, SATCOM, Cyber, etc.





How the JOC Could Work Tomorrow: All Domain SA Production



Analytic Apps on the DAE:

- Start with dynamic maps and charts
- Add animation
- Add analytics – predictive, prescriptive, exploratory

Machine Readable Feeds:

- Get data in structured format
- Get feeds for additional warfighting functions not available today



Conceptual Roadmap



Digitized
Commander's
Daily Briefing



New
Warfighting
Functions

New
Analytics



Full COP,
Situational
Awareness
(SA) and
Analytics
for IAMD

(Assumes
Ops from HQ)



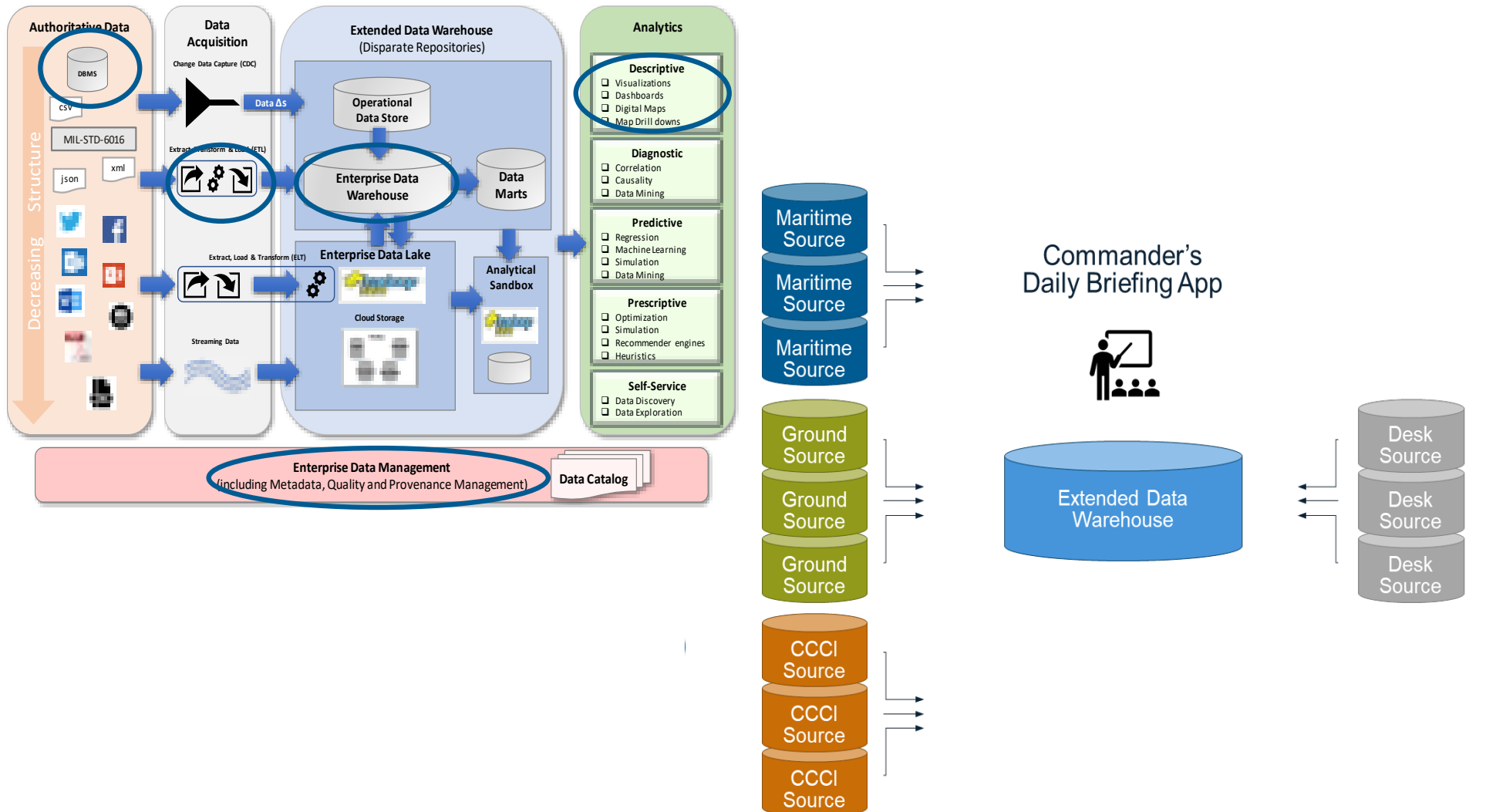
Full COP,
SA and
Analytics
for all
Missions
in Competition
and Conflict



Joint All
Domain C2
for all
Missions in
Competition
and Crisis



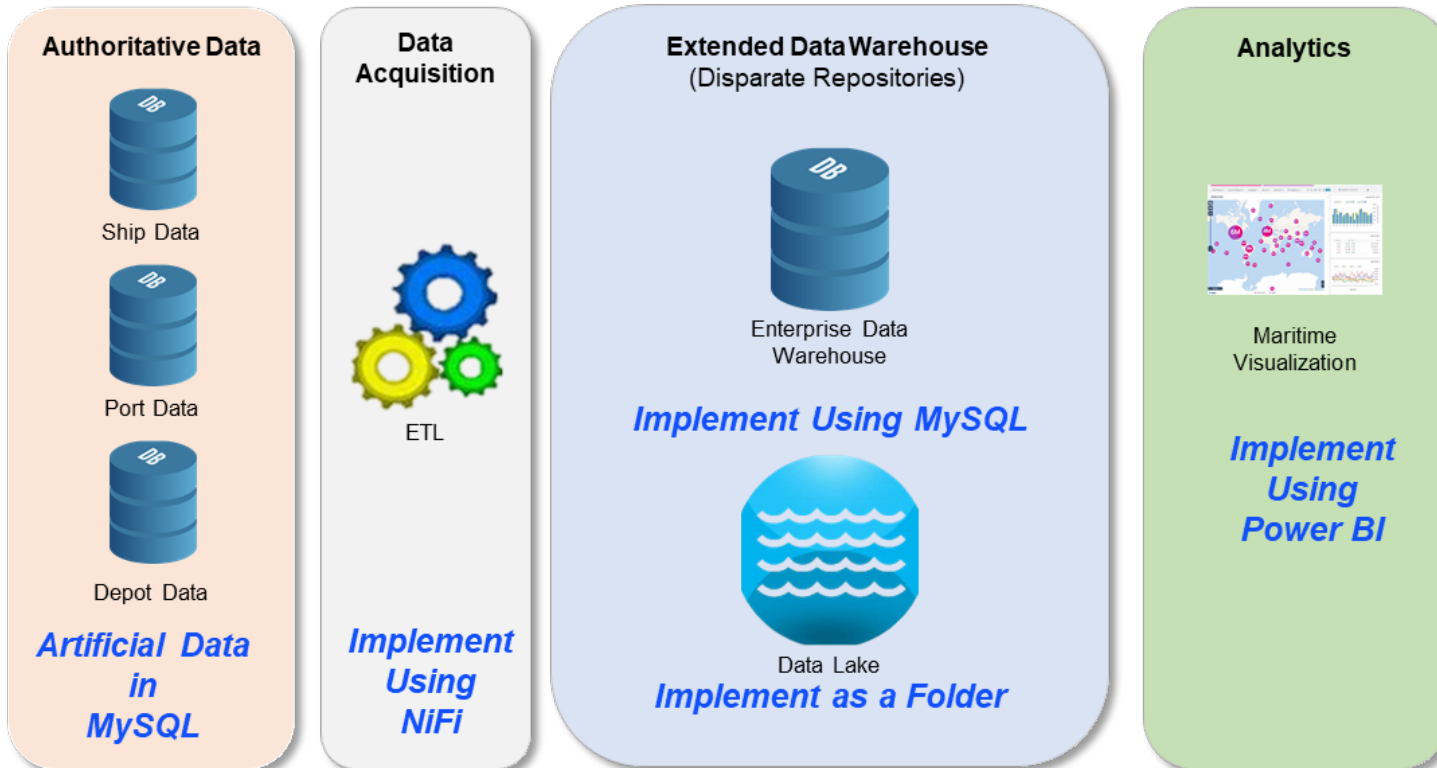
Incremental Development of the DAE and Commander's Daily Briefing





JOC Prototype: DAE Architecture

Built on Power BI



Common attributes

- Wide range of input formats and tiles
- Analytic “App” distribution via url to any device anywhere
- Separates App
- development by analyst from end user access
- Easy to learn and use
- Ability to capture transformations for record management by saving the code

Unique attributes

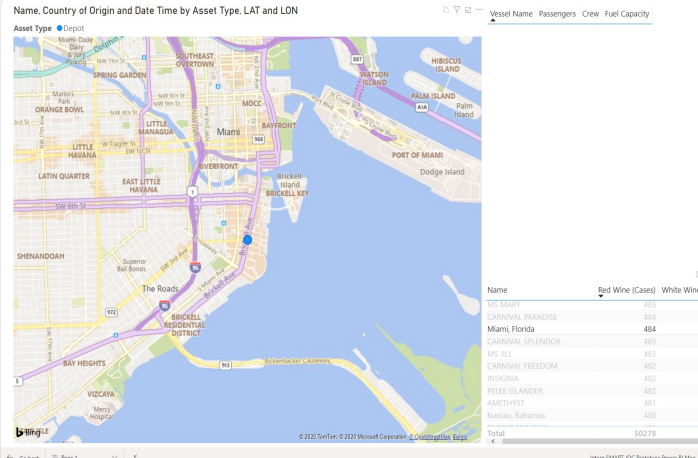
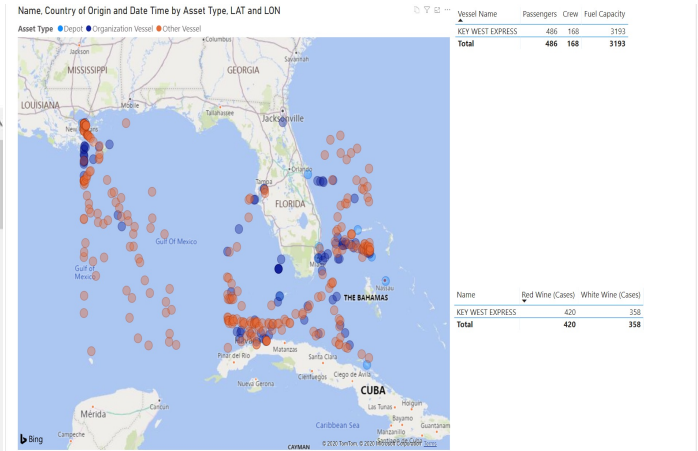
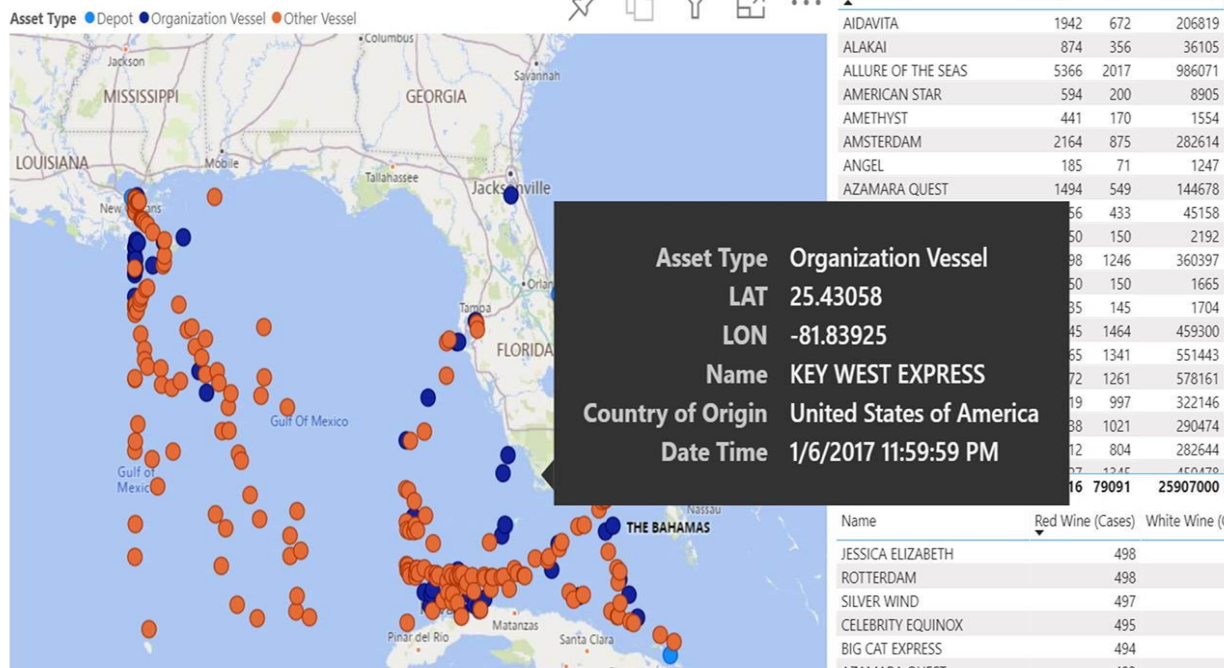
- esri ArcGIS maps and analytics (e.g., LOS, routing and drive time)
- Connection to Azure
- On SIPR at CENTCOM already

Enterprise Data Management
(including Metadata, Quality and Provenance Management)
Implement Using Excel Spreadsheet



JOC Prototype: Commander's Daily Briefing App

Name, Country of Origin and Date Time by Asset Type, LAT and LON



Unclassified Use Case – Cruise Line Company



Use Case

COVID CRISIS ACTION TEAM (CAT)

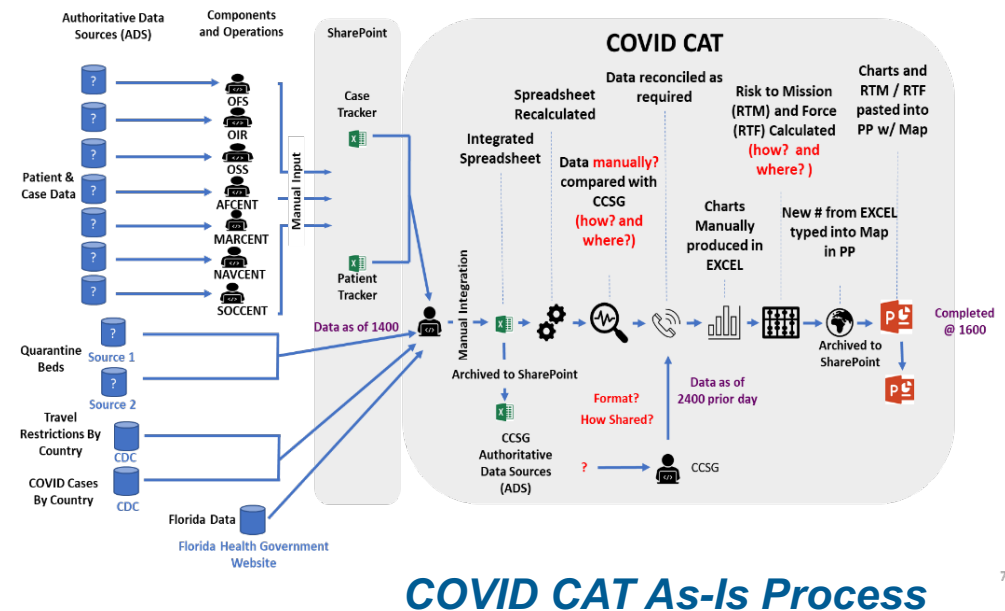


COVID CAT Requirement

- CAT Director required an automated briefing built from spreadsheet and web data, reducing current manual staff effort

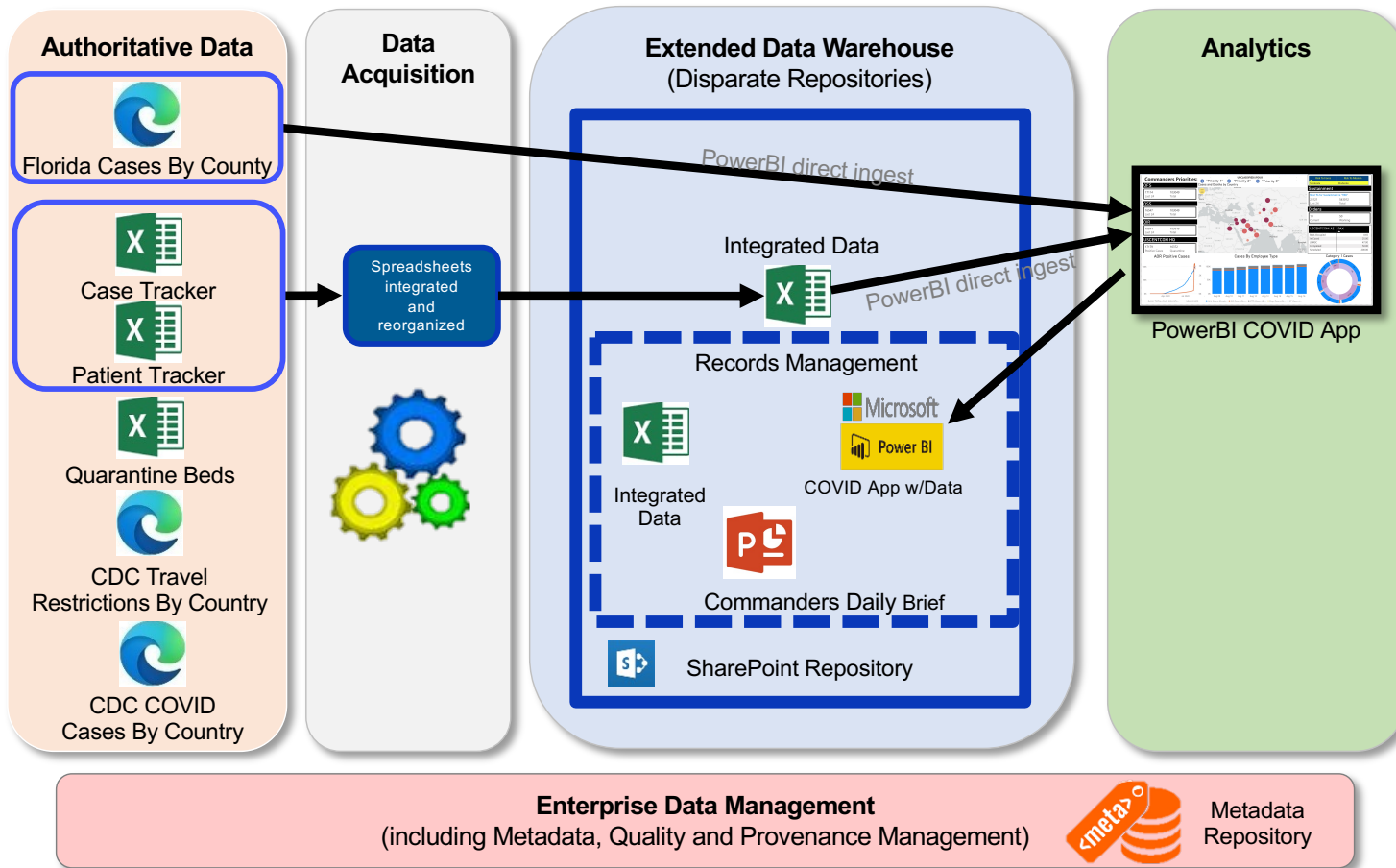
• Team:

- Captured inputs/outputs and process
- Developed unclassified replica of the input data
- Developed prototype DAE & COVID CAT App
- Did not change data collection approach



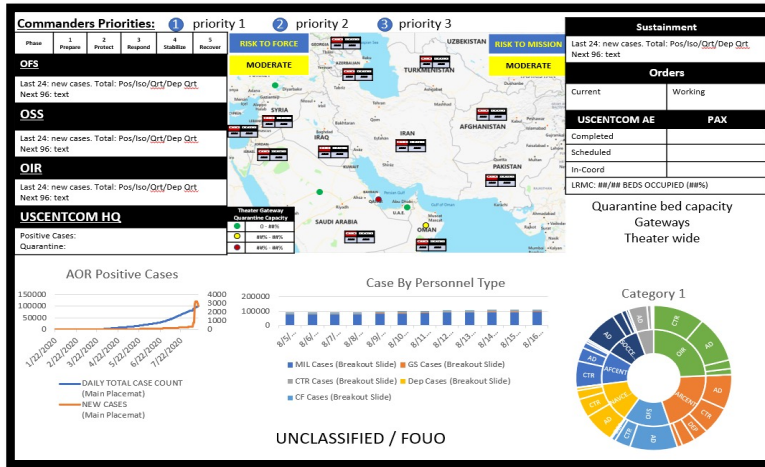


COVID CAT Prototype DAE Architecture

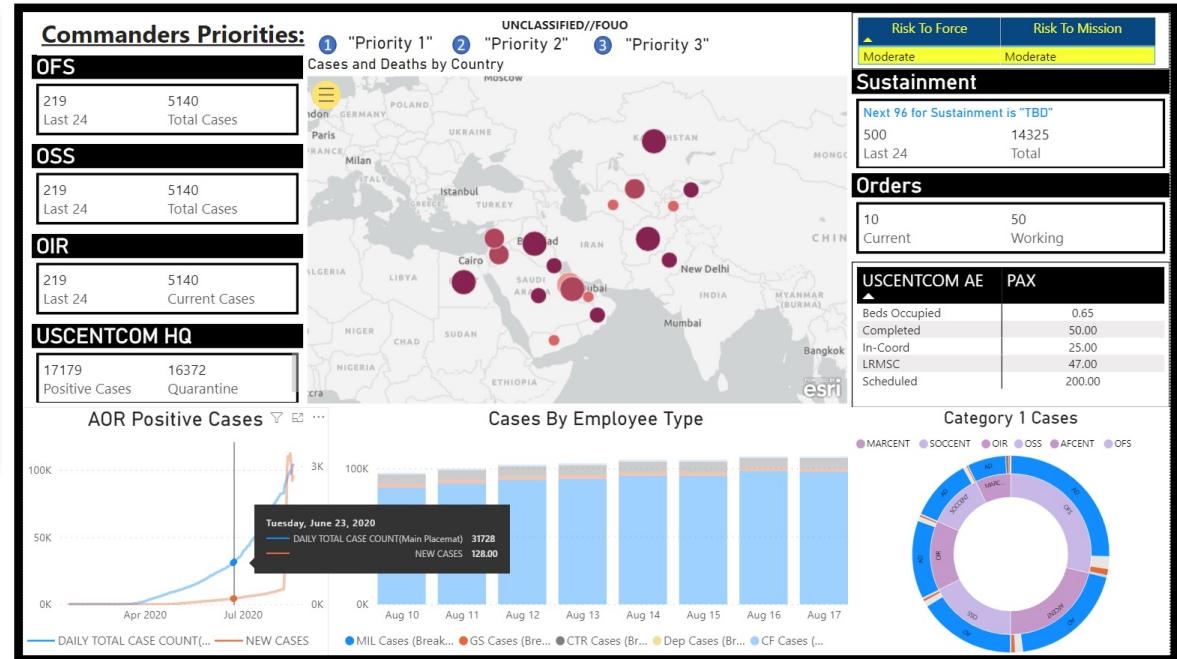




COVID CAT Prototype: COVID CAT App



Static PowerPoint Slide



Dynamic Dashboard Features:

Selecting 1 day on any tile shows just that day on all others.

The map is animated over time.

Hovering provides additional information.

Data can be automatically refreshed from EXCEL when local user makes changes and when .csv files from global COVID website* are updated.

Map icons more readily processed cognitively.

* emulating accessing a protected website



Lessons Learned and Next Steps

Lessons Learned	Next Steps
<p>Much of the data coming into the Command is unstructured upon arrival... but not at its source</p> <ul style="list-style-type: none">• The Command often does not have access to the structured data at its source	<p>For the JOC:</p> <ul style="list-style-type: none">• Capture remaining processes and sources• Establish project to automate data collection, integration and warehousing and add analytics
<p>Other parts of the Command are addressing similar problems but with different approaches.</p>	<p>Stand up Data Science and Analytics Round Table.</p> <ul style="list-style-type: none">• Share problems and solutions• Develop prototypes to improve Commander's Situational Awareness
<p>Commodity tools provide quick, easy and inexpensive visualization capability and potential for:</p> <ul style="list-style-type: none">• More analytics• Automated data input• Dashboard distribution• Improved Records Management• Advanced geospatial analytics	<p>Assess all candidate DAE tools and methods through prototyping and experimentation.</p>



QUESTIONS?

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