

# Improving Trustworthiness of Enterprise Data for Decision Making

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Air Force MOIE

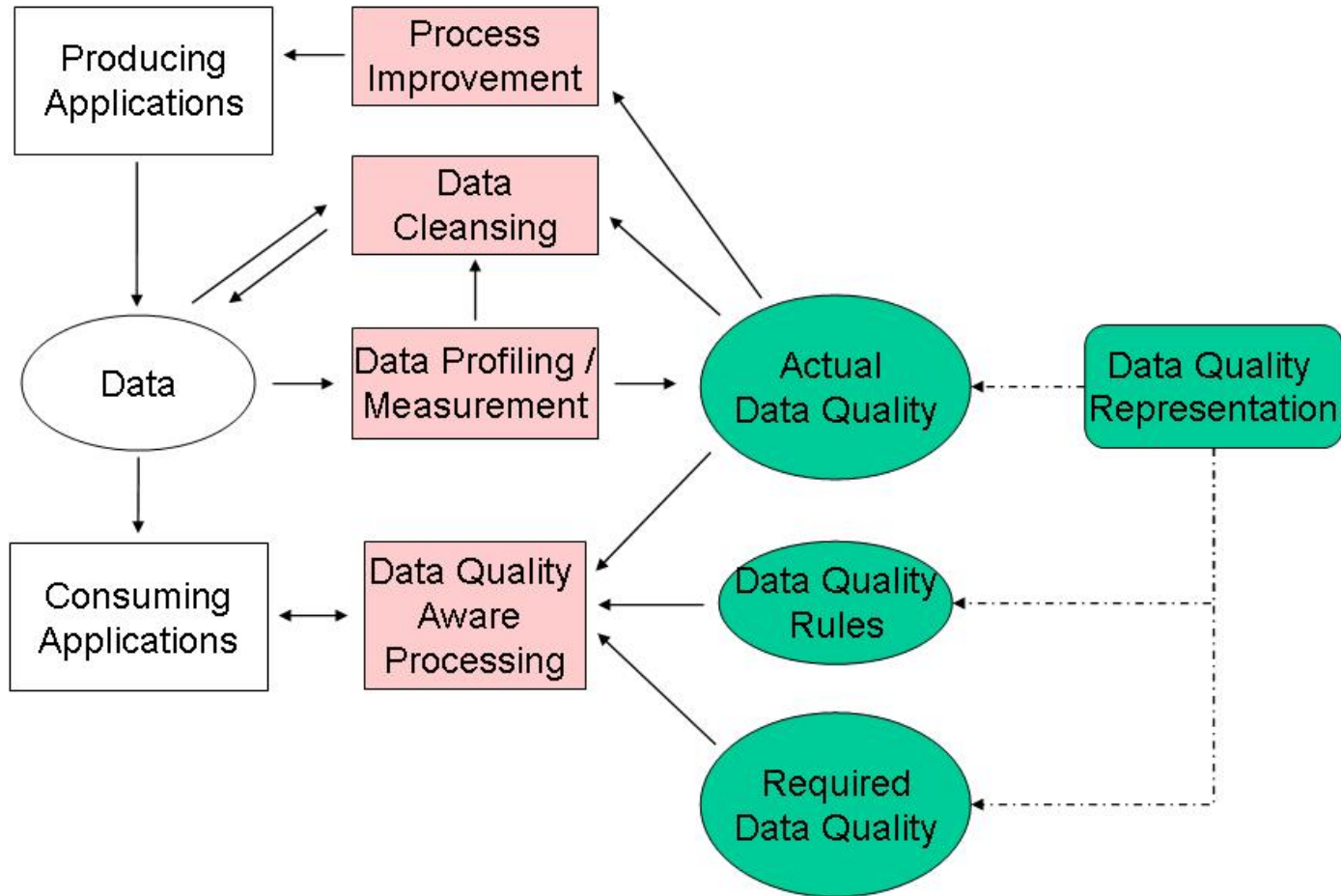
The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow, orange, and blue to the left of the text.

**MITRE**  
Technology  
Program

# Problem

- **Data of unknown quality is inherently untrustworthy**
- **Data of known quality can be treated appropriately by decision support tools and other systems**
- **The Air Force depends on data that is manipulated and aggregated by hundreds of legacy systems**
- **However, this data lacks semantics needed for trustworthy data processing and decision making**

# Background



# Objective

- Define, capture and use the semantics of data quality to improve local and global decision making and information processing
- Types of Data Quality:
  - Accuracy
  - Precision
  - Completeness
  - Consistency
  - Timeliness
  - Lineage/Pedigree

# Activities

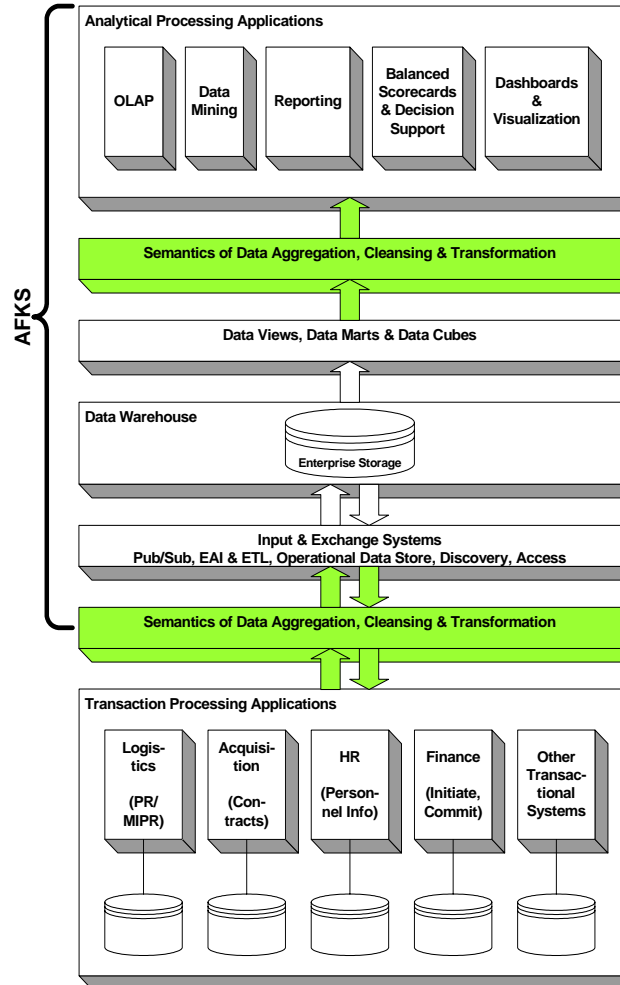
- **Surveys:**
  - **DQ Taxonomies/Ontologies**
  - **DQ Assessment/Profiling Tools**
  - **Semantic Processing & Metadata Tools**
- **Research:**
  - **Annotating Data with DQ Metadata**
  - **Error Propagation**
  - **DQ Aggregation**
  - **Incorporating DQ into Decision Making**
- **Prototyping:**
  - **DQ Assessment**
  - **DQ Representation**
  - **DQ Presentation**

# Highlight

Global decision making, Analytics

Aggregation, Data cleansing, ETL, Periodic load

Local decision making, Continuous update



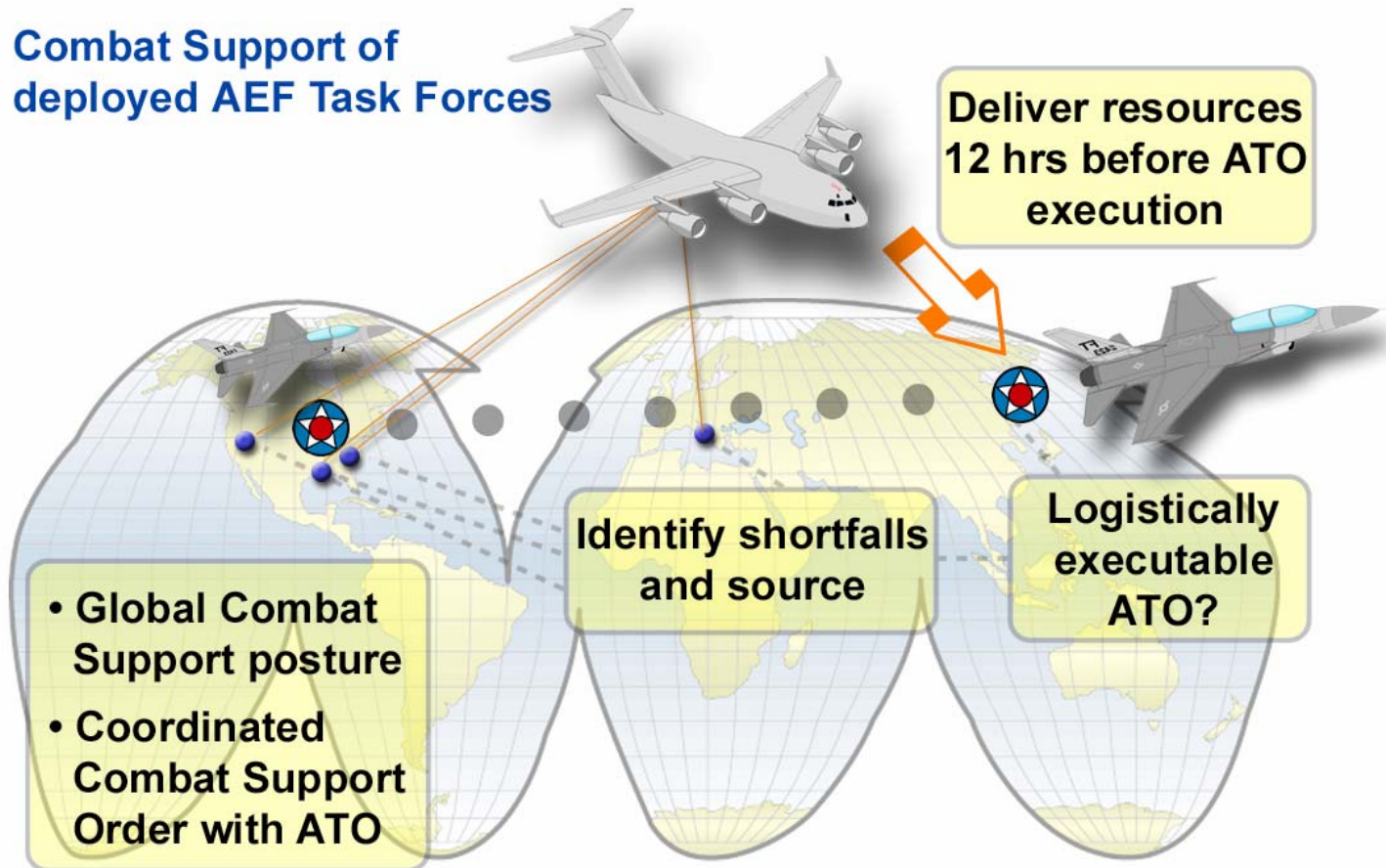
*Data Warehousing Perspective*

Exploit Semantics

Capture Semantics

# Highlight

## Combat Support of deployed AEF Task Forces



# Impacts

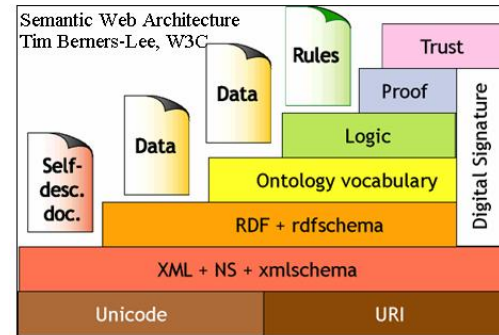
- **Clarify the relevance and limitations of a data set to support a given decision**
  - **Mitigate cases where decision-maker is forced to act on data that is incomplete or uncertain**
  - **Suggest ways to improve the provision of data to better support the decision**
- **Trustworthiness modeling – tools to build a quality-aware business process and use the actual data quality metadata captured earlier**

# Future Plans

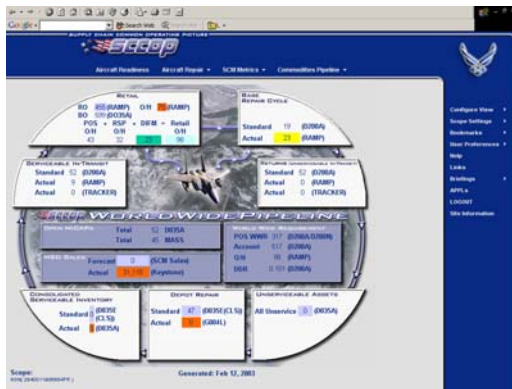
## Targeting Accuracy, Precision & Timeliness



## Using Ontologies in Logic Engines



## Common Operating Pictures



## Six Sigma Continuous Process Improvement



## Balanced Scorecards & Dashboards

