A Slice of What Analysts Do, and How Human-Machine Collaboration Can Help

Ken Thompson (klthomp3@ncsu.edu), James Smith (jtsmith23@ncsu.edu)
Mike Green (magree22@ncsu.edu)

NC STATE UNIVERSITY

Laboratory for Analytic Sciences
Collaborate. Innovate. Transform.

Situation and Obstacles

To develop a capability that enables analysts and machines to work together without requiring an analyst to explicitly tell the machine what to do, **it is necessary to understand analysts' workflows, identify the associated pain-points, and know where in the workflows those pain-points occur.** However, analyst workflows are numerous and varied, making it difficult to understand the common threads between them.

Proposed Solution

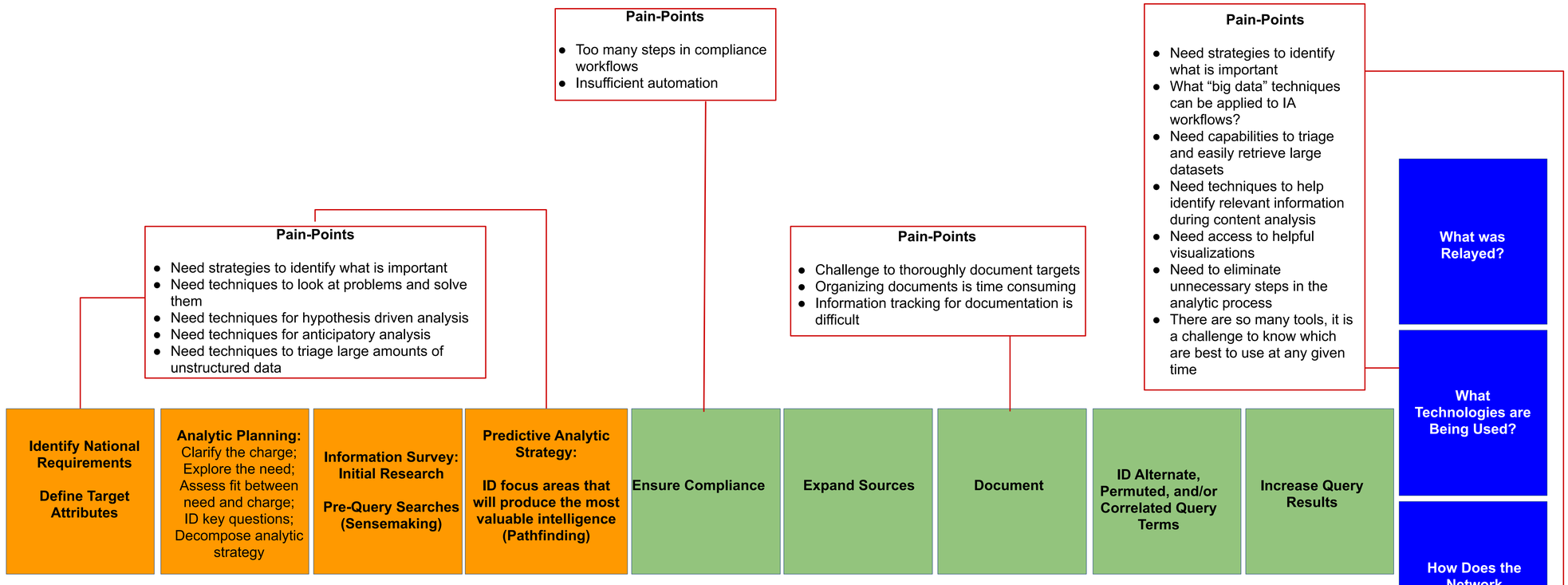
Study numerous analyst workflows, identify classes of analyst tasks (elements) from workflows, identify pain-points and couple them with relevant elements, research and develop potential HMC solutions (interventions) to alleviate said pain-points.

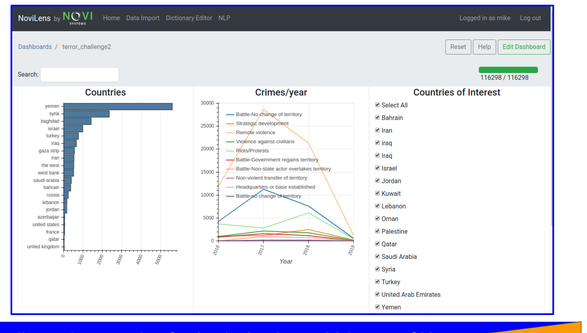
Methodology

Build on past research; leverage analyst expertise; analyze tradecraft taught to analysts; analyze analyst self-documented tradecraft; develop Jupyter notebooks to analyze workflow instrumentation data; analyze survey data, develop interventions.

Elements of the Information Discovery Workflow

The elements of the information discovery workflow, along with pain-points and proposed HMC interventions, are visualized below. The elements can be completed by one, or many, analysts in nearly any order. The representation of the information discovery workflow below shows classes of analyst tasks (elements), select pain-points that can occur at each, and interventions that may alleviate certain pain-points.



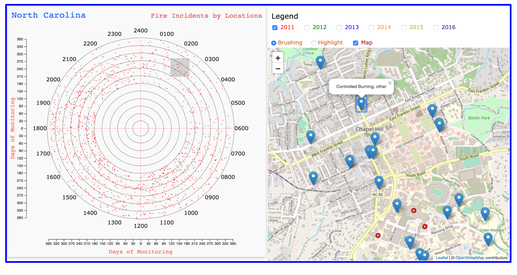


NoviLens: Intervention for Analyzing Large Volumes of Unstructured Data

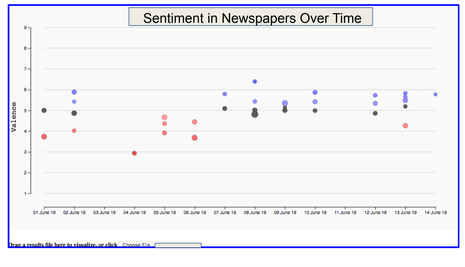
Dr. Michael Kowolenko

Augmented Reality with Machine Learning Assistants: Intervention for Triage and Sensemaking

See poster titled *Augmented Reality Interface for Improving Analyst Interaction with Machine Learning Assistants* by Hong et al



Coordinated Multiple View Geospatial Visualization: Intervention for for Baseline Detection



Temporal Sentiment Visualization: Intervention for Analyzing Sentiment in Unstructured Data