

Situation and Obstacles

Analysts need to find, analyze, and share relevant data with decision-makers at the point of first relevance. However, many obstacles stand between them and the discovery of actionable intelligence: For example:

- Triaging big data
- Triaging tools (which tool is most apt?)
- Getting exposure to more varieties of data for corroboration and correlation
- Executing lengthy multi-step workflows
- Triaging queries (which query is most apt?)
- Making time to devise and consider alternative courses of action
- And those are just some of the challenges!

Proposed Solution

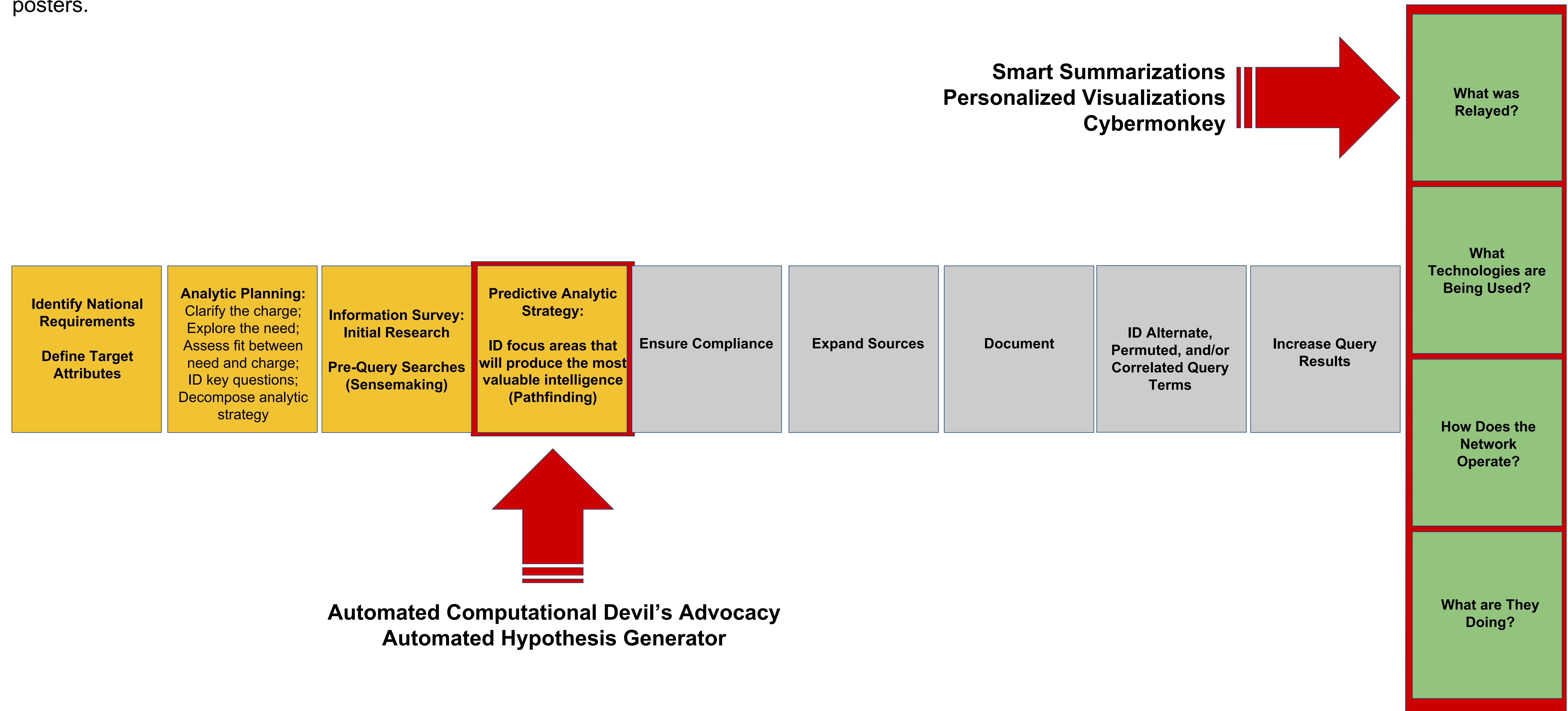
What if machines were more proactive during analysts' information discovery process? Instead of analysts doing all the work, including telling the machines what to do, the machine had agency to complete certain tasks (interventions). As a member of a human and machine collaborative team, the machine could help lessen the obstacles between the analysts and the discovery of actionable intelligence. However, to build a Human-Machine Collaboration (HMC) system, it is, in part, necessary to understand the complexities of the analyst workflow.

Methodology

We leveraged LAS and community analyst expertise; reviewed tradecraft taught to our analysts; analyzed what our analysts say they do; and, began analyzing workflow instrumentation data to see what they do. This allowed us to identify several steps/elements of the information discovery process, as well as a few pain-points experienced by analysts. As we identified pain-points, we worked with our academic and industry partners to begin research and development of HMC interventions that could alleviate those pain-points.

Elements of the Information Discovery Workflow

The abstracted steps/elements in the information discovery workflow, along with the proposed HMC interventions, are visualized below. These steps/elements are not always completed in this order, or even always done by a single analyst, but the representation below provides an abstraction of a documented and vetted information discovery workflow. The **yellow boxes** represent steps involving research and strategizing, the **gray boxes** represent steps related to queries of collected data, and the **green boxes** represent steps related to filtering and summarizing collected data returned from the queries. The HMC interventions, represented as red arrows, can be applied to other steps/elements in the workflow. Additionally, those interventions are R&D goals of other 2018 Collaborative Computing research projects. Details on those efforts can be found on their respective posters.



Smart Summarizations
Personalized Visualizations
Cybermonkey

- What was Relayed?
- What Technologies are Being Used?
- How Does the Network Operate?
- What are They Doing?

Future Research

- Identify additional steps/elements in the information discovery workflow
- Identify pain-point indicators in workflow
- Identify additional inputs for the machine beyond keystrokes and mouse clicks
- Acquire greater workflow granularity
- Further development of smart summarization, ACDA, AHG, personalized visualization, and cybermonkey analytics