

Social Radar Workflows, Dashboards, and Environments

Jennifer Mathieu

MITRE Corporation,¹ Bedford, MA 01730, U.S.A, jmathieu@mitre.org

Social Radar's objective is to demonstrate a useful, mission-focused, end-to-end environment—a dashboard of sociocultural indicators created using online news, blogs, and social media data processed at scale, as well as tools that support decision-making. This will be done by creating an environment in which the analyst can access: representative data in near-real time; tools that support tailored alerts; and business process tools to create workflows using specific sociocultural tools. These capabilities (tools, models, and forecasts) would allow the analyst to explore data, perform diverse analyses, generate products for decision-makers, and to help communicate analyses through tailored dashboards that support drilldown and knowledge management.

Social Radar is being built as an enterprise-focused testbed for early transition of sociocultural tools. To this end, the Ozone Widget Framework and a supporting architecture is being used. This end-to-end, data-to-decision support system is being built to provide tools to allow analysts to tailor and weight the fusion of indicators, to use online sources to update simulation model parameters to evaluate courses of action, and to use outcomes of course of action models to provide quantitative metrics for indicator integration strategies. This large scope requires an analysis environment that supports the development of common output measures, management of uncertainty analyses, and system evaluation and validation. Making these items requirements from the start ensures that we are addressing the most challenging aspects for use of sociocultural data and tools to support missions.

Designing analyst workflows requires a deep understanding of the analytic task and mission. We are beginning to work with analysts to understand what tools would help them and the kinds of business processes they might use to analyse online data sources. Once the tasks and missions are understood we can adapt Social Radar to support analyst workflows—especially rigorous, easy-to-use methodologies for advanced sociocultural capabilities. For Social Radar to be adopted and for it to be used appropriately, we need to make it useful, easy to use, and convey the rationale that underpins the sociocultural tools. We are focusing on identifying common tasks and planning more broadly for indicator integration. The Social Radar system can also be designed to collect data on system use (searches done, tools used, tools used together, products created). And of course, Social Radar needs to be continuously refined to improve the analyst experience, potentially through the use of an evaluation application or widget.

Based on ten months of prototype development, lessons learned have been collected in these categories:

- Business processes for rigorous use of analytic tools and series of tools (workflows)
- Data, indicator, and model outcome visualization strategies (dashboards)
- Supporting architecture for data processed at scale and near-real time monitoring (environments)

¹The views, opinions, and/or findings contained in this report are those of The MITRE Corporation and should not be construed as an official Government position, policy, or decision, unless designated by other documentation. MITRE Technical Report # 120089. © 2012, All Rights Reserved. Approved for Public Release, Distribution Unlimited (Case 12-0567).

In summary, we have demonstrated a proof of concept using analytic tasks (2011 UK Riots, elections protests) and designed and are building a Service Oriented Architecture for integrating multiple internal and external capabilities. The following are the key lessons learned ordered in priority:

- Prototype architecture must separate the presentation, service, and data layers
- A layer of systems engineering for integrating tools from multiple projects is needed
- The agile software development process used was essential, and an agile analytic process is needed to sustain optimal Social Radar development starting with a domain-independent interface
- Data sources must be searchable by the analyst through their own interface, and research needs to be performed to process data at scale
- Social Radar tools need common, normalized output metrics
- The prototype must visually link the situation space with the decision space

Currently we are building the presentation, service, and data layers using the agile development and analytic processes. The new tools will be added to the system incrementally while getting feedback from analysts at every step in the process. The end vision will have a domain-independent interface focused on business process workflows and making it easier for the analyst to understand what is possible with the Social Radar tools. Research is being done on how to make Social Radar scalable to many domains (e.g., instability, violent extremism, WMD, healthcare, cyber, narcotics) at once. This requires a sophisticated domain-independent interface to search data, create workflows using analytic capabilities, and evaluate courses of action. Prototyping tools with real data, real analyst workflows, and integration with a Social Radar dashboard provides greater insight into the problems, bugs, and issues that will arise in the field, reducing the total monetary and schedule cost of developing new capabilities to address the ever-changing online data landscape. Social Radar must simultaneously be an environment to support research and a testbed for early transition of capabilities. Putting an instance of Social Radar on MITRE's external network will allow sponsors and collaborators to interact with the capabilities. Further discussion of the Social Radar vision can be found in the papers below.

Costa, B., et al. (2012) "Social Media Analysis with Social Radar." NATO HFM-201 Meeting on Social Media: Risks and Opportunities In Military Applications. Tallinn, Estonia, 16-18 April.

Mathieu, J., Fulk, M., Lorber, M., Klein, G., and Costa, B. 2012. "Social Radar Workflows, Dashboards, and Environments." NATO Human Factors and Medicine Panel HFM-201-Specialists Meeting on Social Media: Risks and Opportunities in Military Applications.

Servi, L.D. and S. B. Elson. (2012). "A Mathematical Approach to Identifying and Forecasting Shifts in the Mood of Social Media Users" NATO HFM-201 Meeting on Social Media: Risks and Opportunities in Military Applications. Tallinn, Estonia, 16-18 April.