

ODNI-OUUSD(I) Xtend Challenge: Machine Evaluation of Analytic Products

Award: \$25,000

Deadline: January 15, 2018 - 23:59 EST

[Link](#)

Background:

The evaluation of analytic products is an area ripe for exploring new technological capabilities and approaches. Currently, intelligence products are reviewed—prior to publication—by numerous levels of management and edited against an Intelligence Community (IC) agency's signature style using essentially the same methods as publishers have traditionally used. This human-based approach can be highly subjective and often introduces latency that constrains the IC's ability to produce effective and timely intelligence products, and may inhibit potential gains offered by advanced analytics and computational methods.

Complementing these pre-publication reviews, the Office of the Director of National Intelligence (ODNI) Analytic Integrity and Standards (AIS) staff evaluate IC-wide intelligence products after they are disseminated to policymakers and warfighters using the AIS [Rating Scale for Evaluating Analytic Tradecraft Standards](#) (*RSEATS*, see Appendix). Using the *RSEATS*, AIS staff evaluate the IC's analytic products based on a number of established criteria, such as sourcing and accuracy. Analytic offices across the IC use feedback from these reviews to inform their analysts and analytic managers of where they can improve subsequent products.

Missing from the IC's analytic toolset is an objective means for quality control *as products develop*—an IC capability that will be essential should approaches such as ODNI's and the Office of the Under Secretary of Defense for Intelligence's (OUUSD[I]'s) Xpress Challenge ^[2] to craft machine-generated intelligence products bear fruit. Such a capability would also improve the quality and homogeneity of traditional, human-generated analytic products before they are delivered to policymakers and warfighters. Moreover, employing such a feedback loop would provide a means for measurably improving the timeliness of analytic production. To do so, however, the IC will require new tools.

The Challenge:

The Seekers are asking Solvers to describe a viable technical approach for enabling the automated evaluation of finished intelligence products. Solvers must provide a well-supported, technology-based justification for how the proposed solution could—at a minimum—rapidly evaluate and numerically score brief (1-2 page) analytic intelligence products against the specified criteria with no human intervention. Further, the Solvers should describe their solution in the context of allowing trained analysts and analytic managers to understand and accept the solution and be able to evaluate the solution in terms of its trustworthiness, with minimal additional training.

Two files are provided as attachments to this Challenge to help Solvers understand the nature of analytic products and how they are currently evaluated. [Sample Analytic Product Xtend Challenge.pdf](#) is a human-generated analytic product on the topic of cyber security used for the Xpress Challenge, and [AIS Response Evaluation of Sample Analytic Product Xtend Challenge.pdf](#) is the human-generated evaluation of the sample product.

Proposed solutions will be evaluated against their ability to evaluate analytic products by meeting the following **Solution Requirements**:

1. **Properly describes quality and credibility of underlying sources, data, and methodologies.**
The solution should assess whether analytic products identify underlying sources and methodologies upon which judgments are based as well as describing factors affecting source quality and credibility. Such factors can include accuracy and completeness, possible denial and deception, age and continued currency of information, technical elements of collection, as well as source access, validation, motivation, possible bias, or level of expertise. Source summary statements ^[3] are strongly encouraged and should be used to provide a holistic assessment of the strengths or weaknesses of the source base and an explanation of which sources are most important to key analytic judgments and why.
2. **Properly expresses and explains uncertainties associated with major analytic judgments.**
The solution should assess whether analytic products identify and explain the basis for the uncertainties associated with major analytic judgments, specifically the likelihood of occurrence of an event or development and the analyst's confidence in the basis for this judgment. Degrees of likelihood encompass a full spectrum from remote to nearly certain. Analysts' confidence in an assessment or judgment may be based on the logic and evidentiary base that underpin it, including the quantity and quality of source material, and their understanding of the topic. Analytic products should note causes of uncertainty (e.g., type, currency, and amount of information, knowledge gaps, and the reliability of each source) and explain how uncertainties affect analysis (e.g., to what degree and how a judgment depends on assumptions). As appropriate, the solution should identify whether products offer indicators that would alter the levels of uncertainty for major analytic judgments. Consistency in the terms used and the supporting information and logic advanced is critical to success in expressing uncertainty, regardless of whether likelihood or confidence expressions are used.
3. **Properly distinguishes between underlying intelligence information and analysts' assumptions and judgments.** The solution should assess whether analytic products clearly distinguish statements that convey underlying intelligence information used in analysis from statements that convey assumptions or judgments. Assumptions are defined as suppositions used to frame or support an argument; assumptions affect analytic interpretation of underlying intelligence information. Judgments are defined as conclusions based on underlying intelligence information, analysis, and assumptions. Products should state assumptions explicitly when they serve as the linchpin of an argument or when they bridge key information gaps. Products should explain the implications for judgments if assumptions prove to be incorrect. Products also should, as appropriate, identify indicators that, if detected, would alter judgments.
4. **Incorporates analysis of alternatives.** The solution should assess whether analysis of alternatives—the systematic evaluation of differing hypotheses to explain events or phenomena, explore near-term outcomes, and imagine possible futures to mitigate surprise and risk—as appropriate, are incorporated. Analytic products should identify and assess plausible alternative hypotheses. This is particularly important when major judgments must contend with significant uncertainties, or complexity (e.g., forecasting future trends), or when low probability events could produce high-impact results. In discussing alternatives, products should address factors such as

associated assumptions, likelihood, or implications related to U.S. interests. Products also should identify indicators that, if detected, would affect the likelihood of identified alternatives.

5. **Demonstrates relevance to customers and addresses implications and opportunities.** The solution should assess whether analytic products provide information and insight on issues relevant to the customers of U.S. intelligence and address the implications of the information and analysis they provide. Products should add value by addressing prospects, context, threats, or factors *affecting opportunities for action*.
6. **Uses clear and logical argumentation.** The solution should assess whether analytic products present a clear main analytic message up front. Products containing multiple judgments should have a main analytic message that is drawn collectively from those judgments. All analytic judgments should be effectively supported by relevant intelligence information and coherent reasoning. Language and syntax should convey meaning unambiguously. Products should be internally consistent and acknowledge both significant supporting and contrary information affecting judgments.
7. **Explains change to or consistency of analytic judgments.** The solution should assess whether analytic products state how their major judgments on a topic are consistent with or represent a change from those in previously published analysis, or represent initial coverage of a topic. Products need not be lengthy or detailed in explaining change or consistency. They should avoid using boilerplate language, however, and should make clear how new information or different reasoning led to the judgments expressed in them. Recurrent products such as daily crisis reports should note any changes in judgments; absent changes, recurrent products need not confirm consistency with previous editions. Significant differences in analytic judgments, such as between two IC analytic elements, should be fully considered and brought to the attention of customers.
8. **Makes sound judgments and assessments.** The solution should assess whether analytic products apply expertise and logic to make the most sound judgments and assessments possible, based on the information available and known information gaps. In doing so, analytic products should present all judgments that would be useful to customers, and should not avoid difficult judgments in order to minimize the risk of being wrong, as long as the evidence supports those judgments. Inherent to this concept is that the analytic message a customer receives should be the one the analyst intended to send. Therefore, analytic products should express judgments as clearly and precisely as possible, reducing ambiguity by addressing the likelihood, timing, and nature of the outcome or development. Clarity of meaning permits assessment for accuracy when all necessary information is available.
9. **Incorporates effective visual information where appropriate.** The solution should assess whether analytic products incorporate visual information to clarify an analytic message and to complement or enhance the presentation of data and analysis. In particular, visual presentations should be used when information or concepts (e.g., spatial or temporal relationships) can be conveyed better in graphic form (e.g., tables, flow charts, images) than in written text. Visual information may range from plain presentation of intelligence information to interactive displays for complex information and analytic concepts. All of the content in an analytic product may be presented visually. Visual information should always be clear and pertinent to the product's subject. Analytic content in visual information should also adhere to other analytic tradecraft standards.

This Ideation Challenge requires a written proposed solution which describes novel technologies or improvements to existing technologies that meet the Solution Requirements described above. Each submission should include:

1. An **executive summary** (no longer than 1-page) of the proposed solution. All Solvers agree to allow the executive summaries of their solutions to be posted on ODNI's webpage and used in other publications reporting the results of this Challenge.
2. **Detailed description** of the proposed solution relative to existing technologies that address the Challenge criteria. Proposed solution descriptions should not exceed 10 pages in length, and should include discussion of how the solution meets each of the **Solution Requirements** stated above.
3. **Drawings/sketches/visual aids** of the proposed solution, if applicable.
4. Optional (will not impact judging): Description of resources, materials, budget, and proposed timeframe needed to develop a prototype capable of evaluating and numerically scoring analytic products.

The proposal should not include any personal identifying information (name, username, company, address, phone, email, personal website, resume, etc.) or any information the Solvers may consider as their Intellectual Property they do not want to share.

This is an Ideation Challenge, which has the following unique features:

- **There is a guaranteed award.** The award(s) will be paid to the best submission(s) **as solely determined by the Seekers**. The total guaranteed payout will be \$25,000, with at least one award being no smaller than \$5,000 and no award being smaller than \$1,000.
- The Solvers are not required to transfer exclusive intellectual property rights to the Seekers. **Rather, by submitting a proposal, the Solver grants to the Seekers a royalty-free, perpetual, and non-exclusive license to use any information included in this proposal, including for promotional purposes.**
- After initial review of submissions, Solvers with highly rated submissions may be asked to provide additional detailed information including, but not limited to, a pseudo-code or better implementation of their proposed solution. An **additional award pool of \$50,000** is available for submissions of this additional information that meet additional criteria specified in the Seekers' request. Such additional requested information is not subject to the standard Ideation licensing provision and Solvers will be asked to grant to the Seekers a non-exclusive license for US government use purposes only if chosen for an additional award.