

# Computational Modeling and Uncertainty Quantification in the Epistemic Culture of Intelligence Analysis



Figure 1. Official Seal of the Office of the Director of National Intelligence.

## An Ethnographic Study to Affect a Cultural Tolerance for Uncertainty

The objective of this study in cooperation with the Intelligence Community is to develop a systematic approach to quantify and assess uncertainty associated with intelligence analysis.

The Intelligence Cycle consists of five steps:

1. Planning
2. Collection
3. Processing
4. Analysis
5. Dissemination

Associated with each step are uncertainties due to cognitive bias, communication, or lack of information.

## Psychology and Uncertainty

Uncertainty is traditionally considered random. Yet, in general people are more comfortable expressing uncertainty linguistically as:

- “very likely”
- “possibly”
- “slightly”
- etc.

First we need to understand the nature of business and the environment in which the intelligence analyst works.

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## Intelligence Analysis Process

We conduct an analysis of the intelligence environment which includes an ethnographic study of Intelligence Community teams to document the characteristics of intelligence analysis and the possible role of various uncertainty methods.

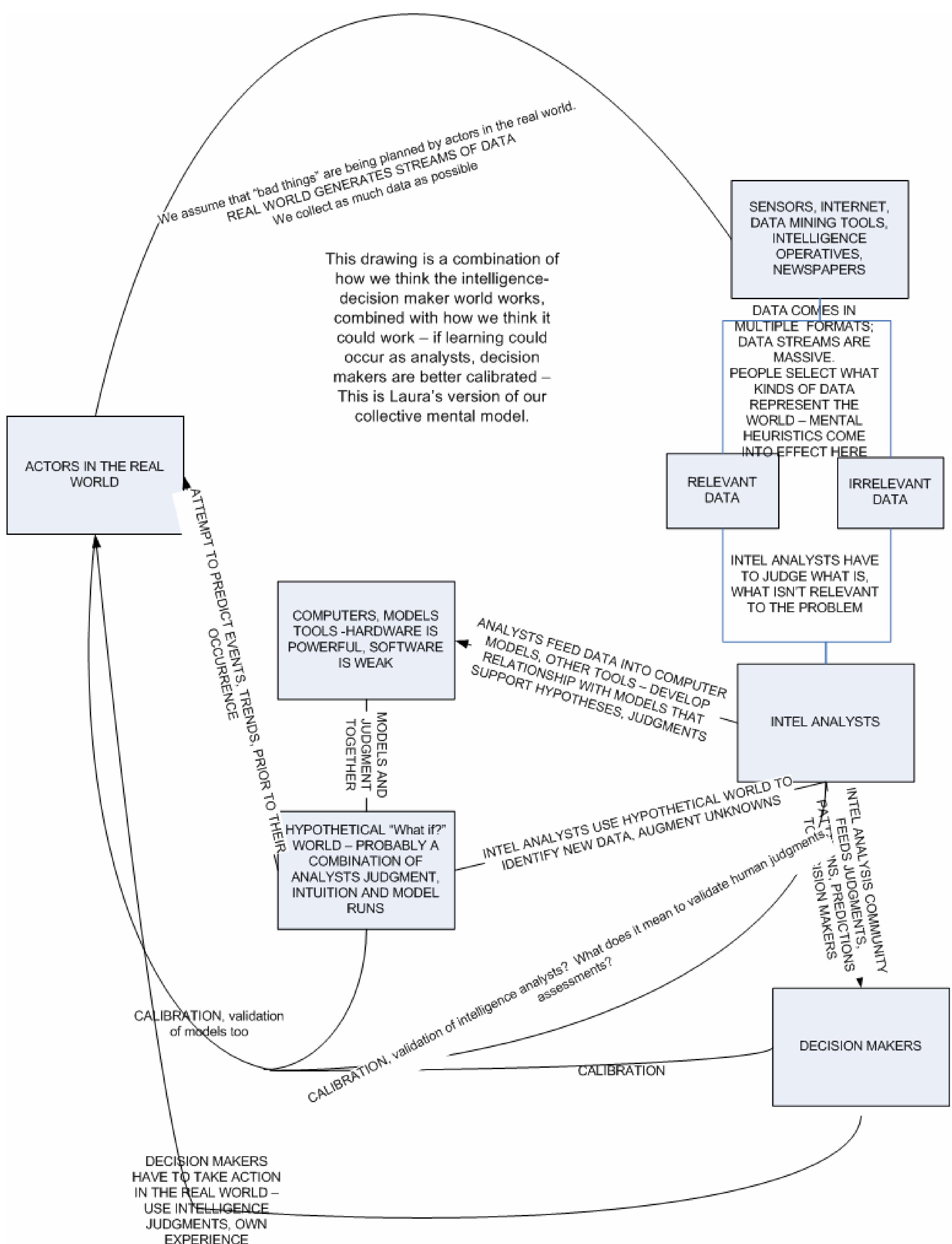


Figure 2. Information flow in the analysis process.

## Goals

As a group, people behave optimally in their work environment. If new methods to account for uncertainty are to be used, then the analyst must be motivated to think in such terms. As such, our research will seek to seed new perspectives on uncertainty for analysts.

## Decision Making Under Uncertainty

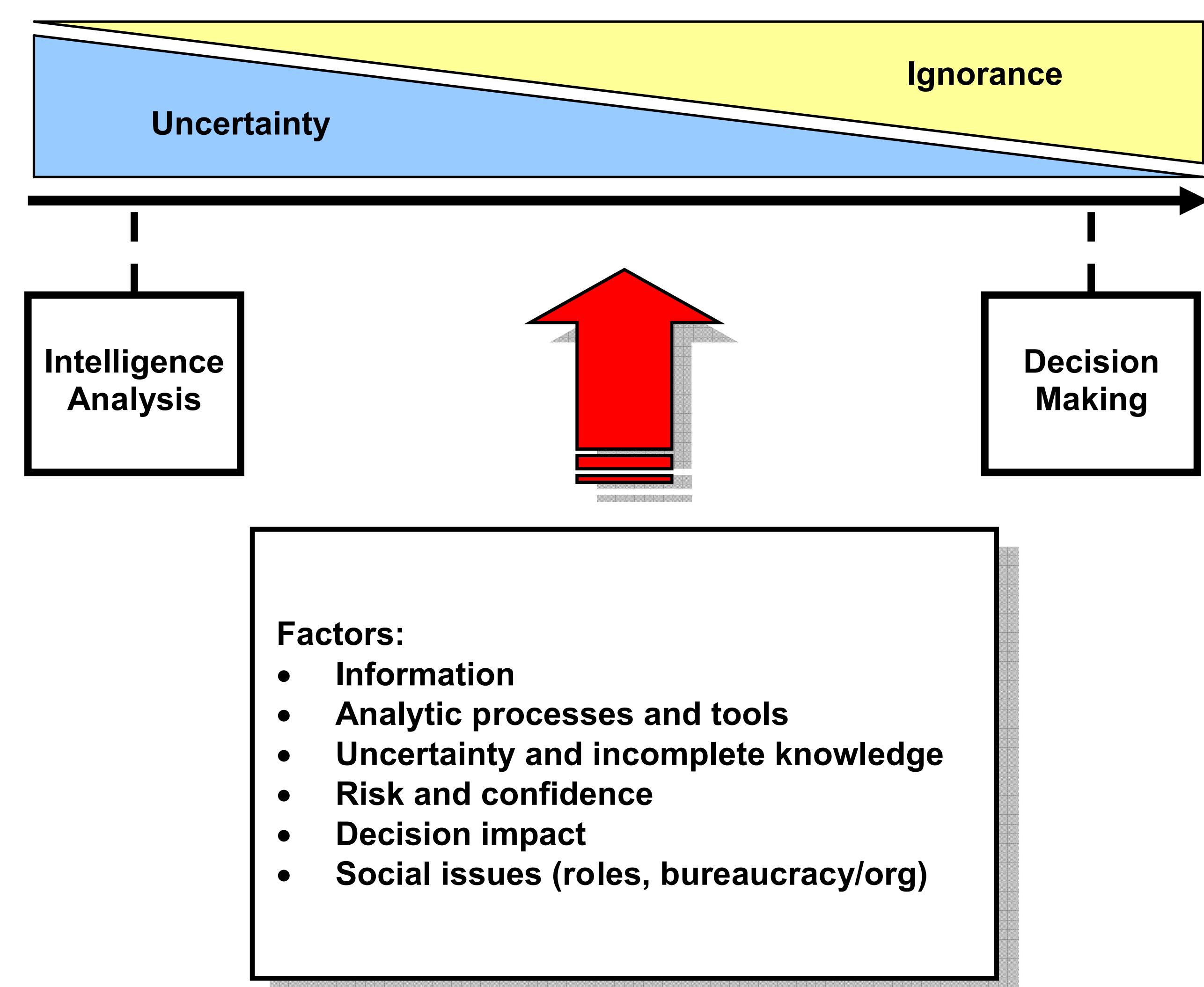


Figure 3. Decision making relative to uncertainty.

## Acknowledgements

Sandia National Laboratories Centers for:  
 Exploratory Simulation and Technologies  
 Information Systems  
 Systems Assessment and Research

## References

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- Klir, George, Uncertainty and Information, 2006, John Wiley and Sons.