

Presentation to:  
National Academies of Sciences  
24 JAN 2018

# Challenges for Engaging in Anticipatory Thinking

**Gary Klein, Ph.D.**  
**MacroCognition LLC**

# What is Anticipatory Thinking?

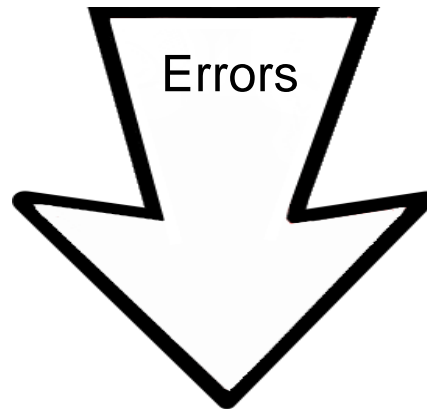
- Anticipatory Thinking is thinking ahead — looking for difficult challenges, recognizing and preparing for threats and opportunities
- Preparing to respond, versus trying to predict future states of the world
- Flags high-threat events, not simply the most predictable events
- Gambling with directed attention

# Misguided Ways to Improve Anticipatory Thinking

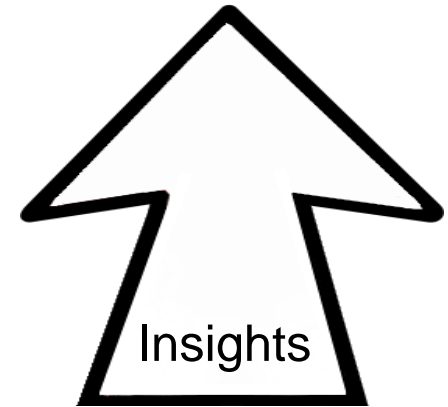
- Reduce mistakes
- Apply rigorous review processes
- Rely on critical thinking protocols, e.g., listing all assumptions
- Encourage analysts to follow procedures and tradecraft
- Evaluate analysts using forecasting accuracy
- Manage large data sets
- Use Artificial Intelligence — build smarter machines
- Try to increase discoveries and insights

Performance  
Improvements

=



+



# Misguided Ways to Improve Anticipatory Thinking

- Reduce mistakes
- Apply rigorous review processes
- Rely on critical thinking protocols, e.g., listing all assumptions
- Encourage analysts to follow procedures and tradecraft
- Evaluate analysts using forecasting accuracy
- Manage large data sets
- Use Artificial Intelligence — build smarter machines
- Try to increase discoveries and insights

# Organizational Stupidity:

## Examples of Organizational Suppression

- The Berlin Wall
- Anticipating the 9/11 attacks
- The Japanese war game for the battle of Midway
- The coup that was missed
- Sherman Kent (CIA); MG Zeira (IDF)
- Stalin's dismissal of signs that Hitler was preparing to attack the USSR
- French military during the German attack in WW II
- NASA's 1986 Challenger disaster
- Snowden, Klein and Chew (2007) study

# The Discovery Paradox

- The more surprising the insight, the greater the resistance
  - Inconsistent with existing beliefs
  - Tendency to fixate on initial beliefs, and to explain away anomalies, and reluctance to test these beliefs when anomalies arise
  - General distrust of creativity and novelty
  - Fear of making an incorrect statement — loss of credibility

# Speculative Thinking

- Speculative Thinking is about managing complexity, uncertainty, anomalies and ambiguity
- Mental simulation
- Abductive reasoning
  - Using analogs and metaphors
  - Using hypotheticals, contrasts and counterfactuals
- Positive heuristics
  - Availability, representativeness, anchoring and adjustment
- Richer mental models

Curiosity — especially about anomalies, rather than fixating on initial beliefs and explaining anomalies away
- Perspective-taking