Anticipatory Thinking

Anticipatory intelligence is the product of intelligence collection and analysis focused on trends, events, and changing conditions. Its objective is to identify and characterize potential threats to U.S. national interests. Anticipatory Thinking (AT) is critical for anticipatory intelligence initiatives.

Anticipatory Thinking for Smart Cities

Anticipatory Thinking Environments (ATEs) will help analysts develop core AT skills and support dynamic analyst-machine interactions.

Future-Oriented Structured Analytics

Structured Analytic Techniques

- Futures Wheel
- Futures Analysis
- Backcasting

Anticipatory Thinking Environments

Hypothesis: Anticipatory Thinking is a cognitive skill that can be developed.

- Enables analysts to envision the future
- Critical for goal-oriented planning
- Enables analysts to use information in novel ways
- Critical for taking proactive rather than reactive actions

Anticipatory Thinking for Smart Cities

Envisioning cities (and smaller communities) of the future

- Envisioning cities (and smaller communities) of the future
- Avoiding unintended consequences
- Ensuring value creation for all citizens
- Anticipating impact of the Internet of Things on critical infrastructure
- Anticipating trends and dependencies in technological, social, and policy decision spaces

Modeling Anticipatory Thinking

Supporting AT requires a solid foundation in cognitive modeling. Creating cognitive models of AT will directly contribute to formulating design requirements for ATEs. These models must be sufficiently granular, expressive, and precise to inform the design of ATE functionalities that mirror cognitive processes while at the same time enabling their extension.

Anticipatory Thinking Environments

Anticipatory Thinking Environments Framework and Platform Design

- Conduct literature review
- Knowledge elicitation and skill decomposition
- Develop design requirements
- Develop prototype Anticipatory Thinking Environment

Instrumented Anticipatory Thinking Environment: Research Platform

A Smart Cities real-time strategy game for AT will enable researchers to investigate how analysts explore implications of anticipated events by traveling forward and backward through causal chains that drive futures.

Anticipatory Thinking Environments

Research & Development Plan

- Conduct observation studies and focus groups
- Revise design requirements
- Iteratively refine Anticipatory Thinking Environment
- Conduct pilot studies

Serious Games for Training

Game-based learning environments create immersive learning experiences that are effective and engaging. ATEs will blend artificial intelligence with game-based learning technologies to create personalized training experiences that engage analysts in challenging goal-directed problem-solving episodes to explore alternate futures and develop an experiential understanding of AT.