





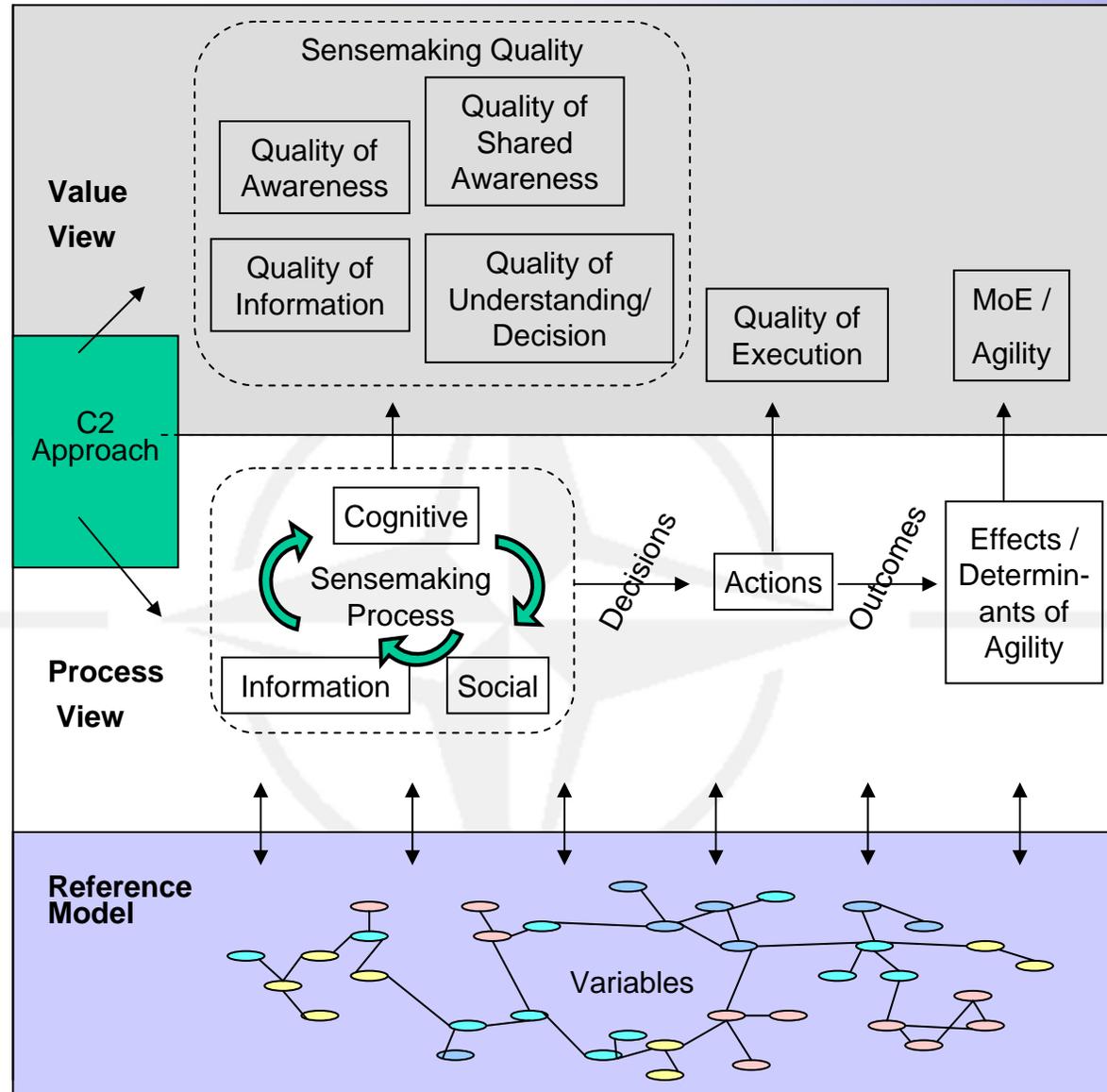
# **AF2T2EA**

## **An Illustrative Example**

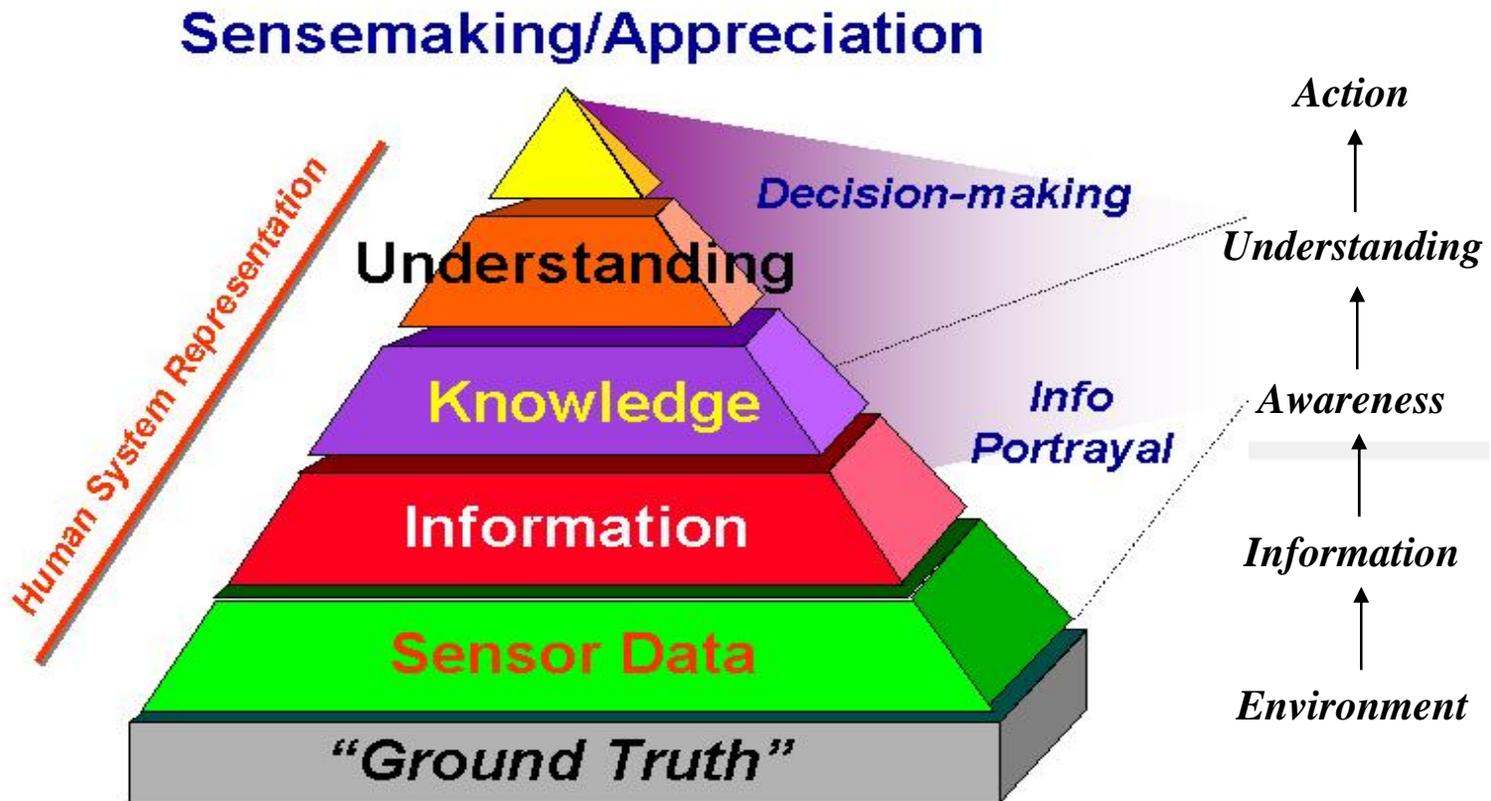
22 June 2006

**Dr. Paul W. Phister, Jr., PE**  
Senior Strategic Planner  
Information Directorate  
Air Force Research Laboratory

# Model Structure



# Cognitive Pyramid



# AF2T2EA Overview

As of May 2005

- *Current process:*
  - Lengthy process to: *Anticipate, Find, Fix, Track, Target, Engage, Assess*
  - Serial set of processes
- *Desired Attributes*
  - Focused, persistent C2ISR for all target categories, to achieve desired effects
  - C2 of ISR assets to persistently track target entities to predict the adversary's courses of action in the battlespace
  - Full-spectrum, networked ISR focused by anticipation in order to re-detect potential targets
  - C2 of ISR to cross-cue assets to precisely geo-locate targets
  - Networked, multi-sensor inputs to characterize a target's operational, physical, functional capabilities, and tactical employment patterns
  - Share information across entire operational network (i.e., collaboration)
  - C2 of ISR assets to persistently track target entities to lead to other target entities
  - Dynamic C2ISR network to enable target engagement at time and place of choosing
  - NRT automated C2 of forces to provide consistent ROE and with human-in-the-loop
  - Automated, machine-to-machine dialogue passing precise decision quality data/information across network to coalition assets
  - NRT and dynamic C2 of ISR assets and collection planning and tasking to execute battle damage assessment of operational effects
  - Deliver information in NRT across network of sensors, decision makers, and strikers to shorten AF2T2EA cycle

# Selected AF2T2EA Capabilities

**A**

- Ability to model, predict and display possible effects and threats
- Anticipate adversary's actions in order to streamline and shorten AF2T2EA cycle
- Ability to model and predict CBRNE and TIM threats and events
- Predict how (Red, Blue, Gray) actions will cascade into direct/indirect effects in support EBO
- Requires correct, current, consistent and shared information

**F**

- Fully merge and integrate sensor/information to support battlespace SA
- Accurate/real-time battlespace SA, enabling decision makers to correctly react to changes
- Rapidly and accurately update situational understanding as a result of changes in SA awareness

**F**

- Accurate and timely positive combat identification of surface, air, and space objects

**T**

- Integration/display and availability of operations information in a common operational picture
- Improve, automate, and streamline monitoring of friendly surface, air and space force location

**T**

- Improve Commander's COA selection and dissemination process

**E**

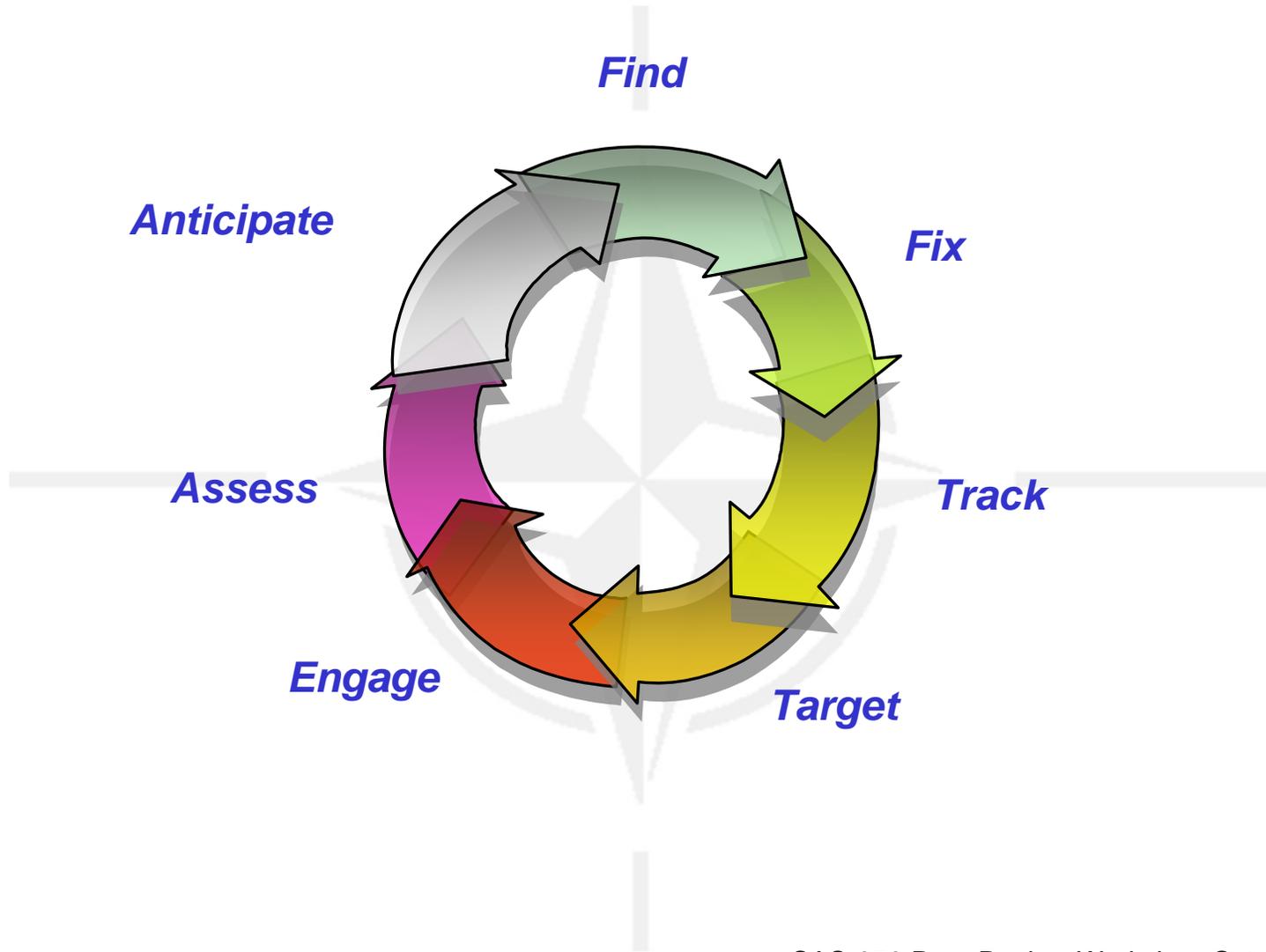
- Better optimized use of the battlespace environment
- Conduct real-time effects-based mission execution
- Real-time collaboration among all C2 entities
- Capability to achieve self-synchronization of forces

**A**

- Real-time Red, Blue Gray force status assessment
- Rapid assessment and selection of targets to maximize desired effects
- Ability to accurately assess surface/air/space impacts of physical environmental conditions
- Improve COA evaluation and requirements process

As of May 2005

# Part 1: CM Variable Mapping to AF2T2EA Events



As of May 2005



# “Anticipate” Event

*Atmospheric Weather*  
*Space Weather*  
*Sensor Persistence*  
*Sensor Coverage (Spacial)*  
*Sensor Coverage (Medium)*  
*Sensor Coverage (Spectrum)*

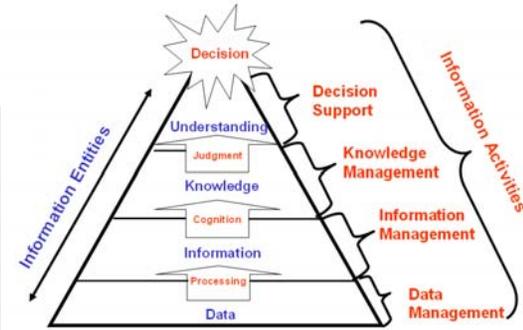
## Environment

<i>Accuracy of Individual Awareness</i>	<i>Collaboration about Intentions</i>
<i>Accuracy of Shared Information</i>	<i>Command Approach</i>
<i>Awareness about Environment</i>	<i>Experience of Personnel</i>
<i>Awareness about Forces</i>	<i>Frequency of Command Interactions</i>
<i>Awareness about Intentions</i>	<i>Frequency of Peer-to-Peer Interactions</i>
<i>Awareness about Mission</i>	<i>History</i>
<i>Collaboration about Environment</i>	<i>Quality of Interactions</i>
<i>Collaboration about Forces</i>	<i>Quality of Peer-to-Peer Interactions</i>

## Awareness

*Understanding about Environment*  
*Understanding about Intentions*

## Understanding



## Information

*Accuracy*  
*Completeness of Information*  
*Completeness of Individual Information*  
*Completeness of Shared Information*  
*Correctness of Information*  
*Correctness of Individual Information*  
*Correctness of Shared Information*  
*Currency of Information*  
*Currency of Individual Information*  
*Currency of Shared Information*  
*Consistency of Information*  
*Consistency of Individual Information*  
*Consistency of Shared Information*  
*Data Interoperability*  
*Distribution of Information*  
*Extent of Shared Information*  
*Fusion*  
*Information Quality*

*Information about Forces*  
*Information about Environment*  
*Information about intentions*  
*Information Uncertainty*  
*Network Reach*  
*Precision of Information*  
*Precision of Individual Information*  
*Precision of Shared Information*  
*Relevance of Shared Information*  
*Richness of Collaborative Environment*  
*Share Information*  
*Timeliness of Information*  
*Timeliness of Individual Information*  
*Timeliness of Shared Information*  
*Trust in Information*  
*Uncertainty*  
*Uncertainty of Shared Information*

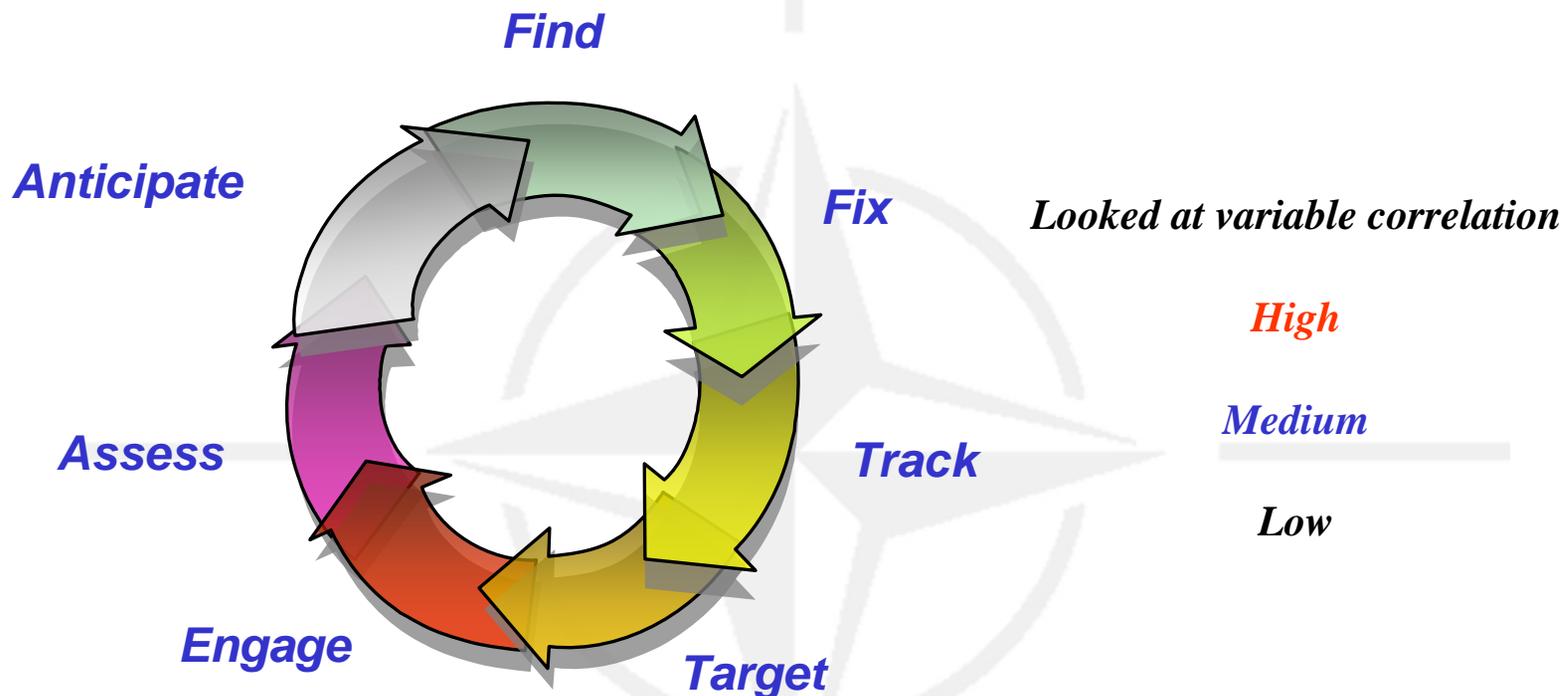
## Decision

*Accuracy of Individual Decisions*  
*Consistency of Individual Decisions*  
*Completeness of Individual Decisions*  
*Correctness of Individual Decisions*  
*Currency of Individual Decisions*  
*Force Effectiveness*  
*Mode of Decision Making of Individual Decisions*  
*Responsiveness*  
*Precision of Individual Decisions*  
*Quality of Decisions*  
*Relevance of Individual Decisions*  
*Speed of Command*  
*Speed of Decision*  
*Speed of Planning*  
*Synchronization of Actions*  
*Task Speed*  
*Timeliness of Planning*  
*Timeliness of Individual Decisions*  
*Uncertainty of Individual Decisions*

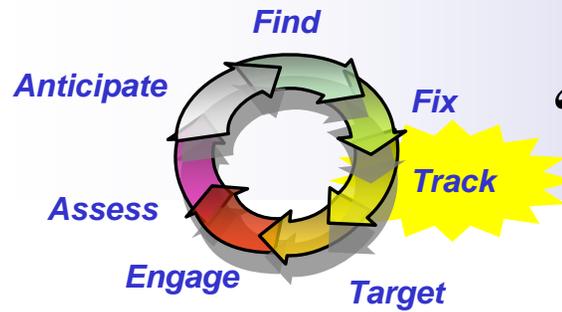
# Part 2:

## CM Variable Mapping to AF2T2EA Value

As of May 2005



As of May 2005



# “Track” Capabilities

Integration and display of operations information in a common operational picture available to entire network

*Accuracy*      *Adaptiveness*  
*Analyze*  
*Atmospheric Weather*  
*Dynamics across Time*  
*History*      *Indirect Sensing*  
*Network Reach*      *Responsiveness*  
*Robustness*  
*Accuracy of Shared Information*  
*Completeness of Individual Information*  
*Completeness of Information*  
*Completeness of Shared Information*  
*Consistency of Individual Information*  
*Consistency of Information*  
*Consistency of Shared Information*  
*Correctness of Individual Information*  
*Correctness of Shared Information*  
*Currency of Individual Information*  
*Currency of Information*  
*Currency of Shared Information*  
*Distribution of Information*  
*Dynamics across Time*

*Accuracy of collective Awareness*  
*Accuracy of Individual Awareness*  
*Accuracy of Intersection Awareness*  
*Accuracy of Partial Awareness*  
*Awareness about Environment*  
*Awareness about Forces*  
*Awareness about Intentions*  
*Awareness about Mission*  
*Completeness of Individual Awareness*  
*Consistency of Individual Awareness*  
*Correctness of Collective Awareness*  
*Correctness of Individual Awareness*  
*Correctness of Partial Awareness*  
*Currency of Collective Awareness*  
*Currency of Individual Awareness*  
*Precision of Individual Awareness*  
*Timeliness of Collective Awareness*  
*Timeliness of Individual Awareness*  
*Uncertainty of Collective Awareness*

*Accuracy of Collective Understanding*  
*Accuracy of Individual Understanding*  
*Accuracy of Intersection Understanding*  
*Accuracy of Partial Understanding*  
*Completeness of Collective Understanding*  
*Completeness of Individual Understanding*  
*Completeness of Intersection Understanding*  
*Completeness of Partial Understanding*  
*Consistency of Individual Understanding*  
*Consistency of Intersection Understanding*  
*Consistency of Partial Understanding*  
*Correctness of Collective Understanding*  
*Correctness of Individual Understanding*  
*Correctness of Partial Understanding*  
*Currency of Collective Understanding*  
*Currency of Individual Understanding*  
*Extent of collective Understanding*  
*Extent of Partial Understanding*  
*Shared Understanding*  
*Timeliness of Collective Understanding*  
*Timeliness of Individual Understanding*  
*Uncertainty of Collective Understanding*

*Extend of Shared Information*  
*Flexibility*  
*Fusion*  
*Information about Environment*  
*Information about Forces*  
*Information about Intentions*  
*Information Quality*  
*Information Uncertainty*  
*Precision of Individual Information*  
*Precision of Information*  
*Precision of Shared Information*  
*Relevance of Shared Information*  
*Shared Understanding*  
*Timeliness of Shared Information*  
*Timeliness of Individual Information*  
*Timeliness of Information*  
*Uncertainty of Shared Information*

Improve, automate, and streamline monitoring of friendly air and space force location

*Adaptiveness*  
*Analyze*  
*Collaboration about Environment*  
*Collaboration about Forces*  
*Collaboration about Intentions*  
*Collaboration about Mission*  
*Command Approach*  
*Distribution of Information*  
*Dynamics across Time*  
*Experience of Personnel*

*Responsiveness*  
*Risk Propensity*  
*Robustness*  
*Speed of Command*  
*Speed of Decision*  
*Speed of Planning*  
*Synchronization of Decisions*  
*Synchronization of Actions*  
*Task Competency*  
*Task Speed*

*Timeliness of Individual Decisions*  
*Training*  
*Trust in Information*  
*Mobility*  
*Understanding about Environment*  
*Understanding about Forces*  
*Understanding about Intentions*  
*Understanding about Mission*  
*Flexibility*

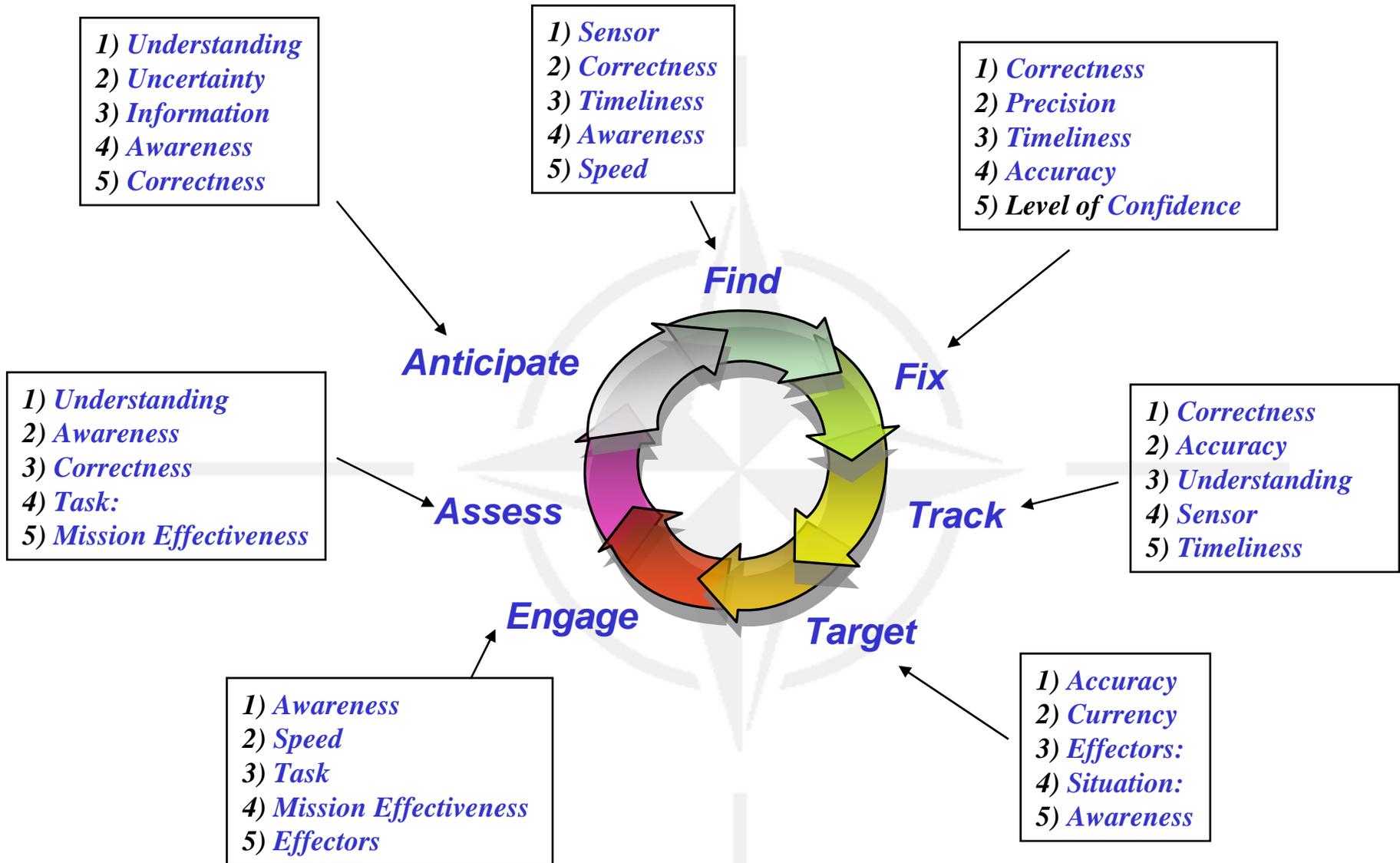
*History*  
*Innovation*  
*Level of Confidence*  
*Perception of Cause and Effect*  
*Quality of Decisions*  
*Quality of Plan*  
*Sensor Coverage (Medium)*  
*Sensor coverage (Spacial)*  
*Sensor Coverage (Spectrum)*  
*Space Weather*

**High Correlation**  
**Med Correlation**  
**Low Correlation**  
 to  
**“Track”**

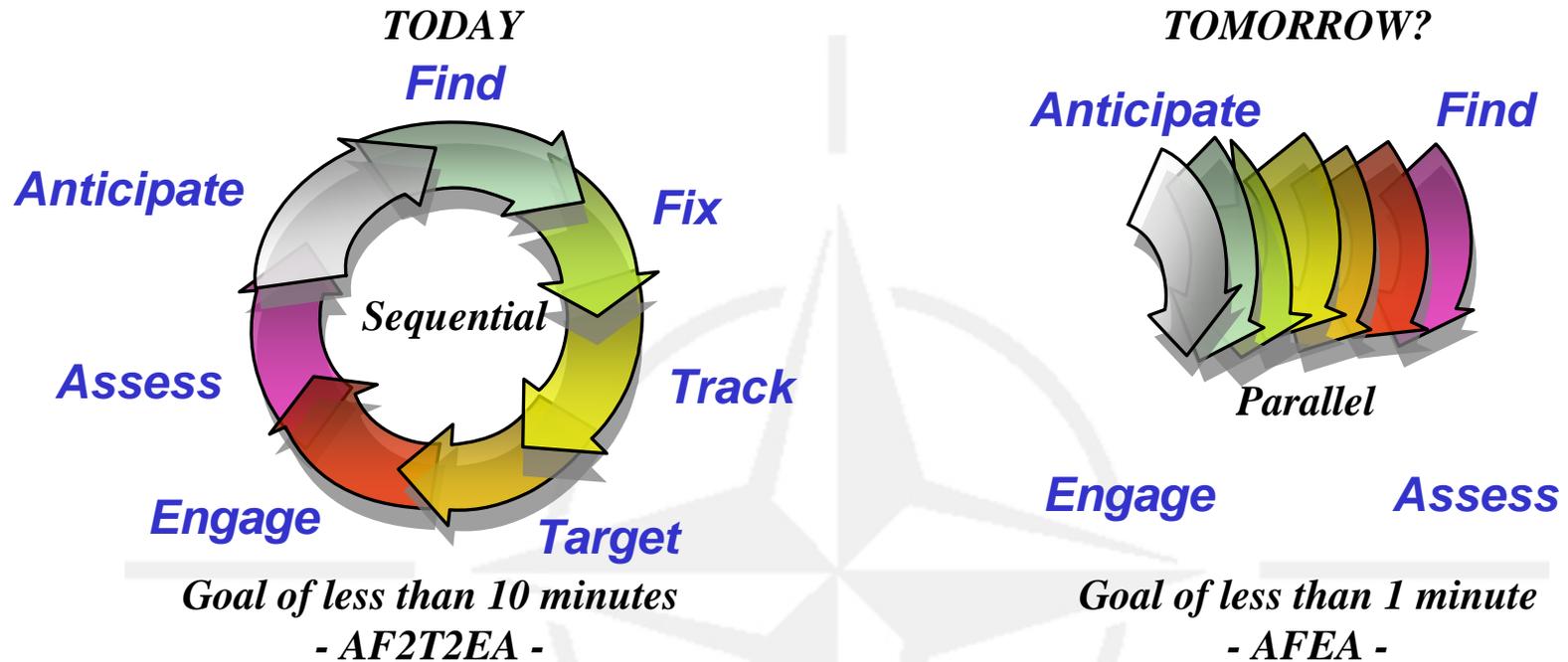
# Value View of AF2T2EA

## Top 5 Variables

As of May 2005



# Summary



- *Matched C2 concept variables to AFT2T2EA process for verification*
- *Good match for both the event and value view*
- *Goal would be to use the C2 concept variables to “assist” in moving from today’s to tomorrow’s view*



# Questions?



*“Information superiority becomes a precondition for fighting to achieve air and space superiority.”*

**LtGen Liu Shunyao**

**Chief, China Peoples Liberation Army Air Force**

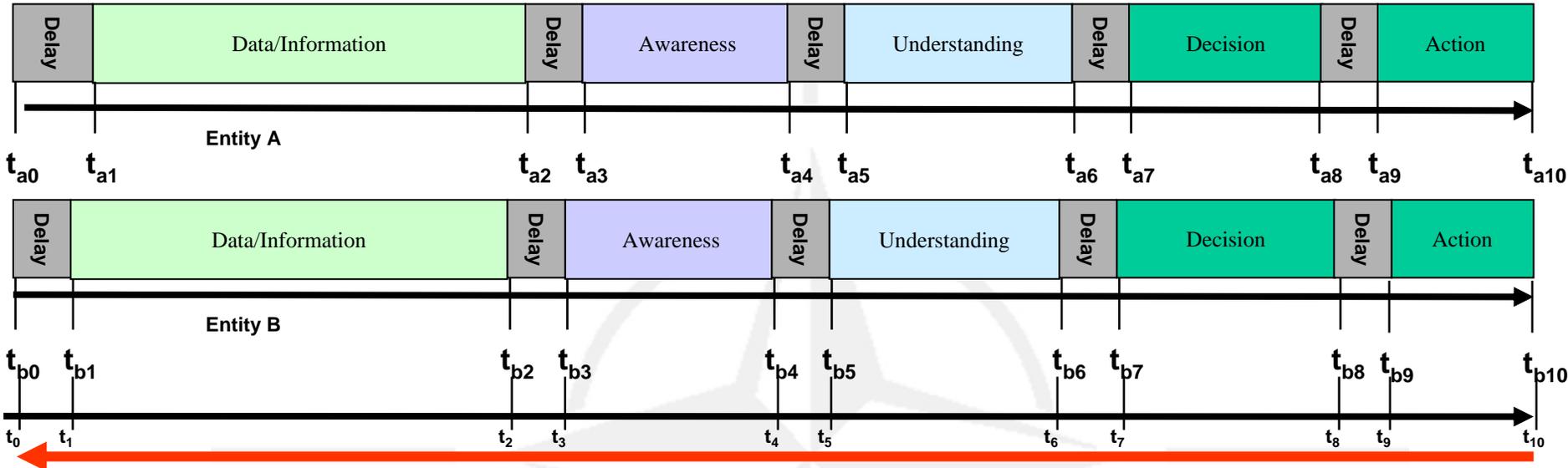
**28 Feb 2000**



# Back Ups

# Network Centric Operations Timeline Relationships

## Generic Timeline (Time in Units)



### Basic Times:

- $t_{a2} - t_{a0}, t_{b2} - t_{b0}$  Time to receive, process, disseminate data/information
- $t_{a4} - t_{a2}, t_{b4} - t_{b2}$  Time to analyze and gain awareness
- $t_{a6} - t_{a4}, t_{b6} - t_{b4}$  Time to analyze and gain understanding
- $t_{a8} - t_{a6}, t_{b8} - t_{b6}$  Time to analyze and make a decision (Speed of Decision)

### Individual times:

- $t_{a4} - t_{a0}, t_{b4} - t_{b0}$  Time to Awareness
- $t_{a6} - t_{a0}, t_{b6} - t_{b0}$  Time to Understanding
- $t_{a8} - t_{a0}, t_{b8} - t_{b0}$  Time to make a Decision (Speed of Command)
- $t_{a10} - t_{a0}, t_{b10} - t_{b0}$  Time to Action (Speed of Action)

### Collaboration Times:

- $\text{MAX}(t_{a4}, t_{b4}) - t_0$  Time to Shared Awareness (time to achieve a collective awareness)
- $\text{MAX}(t_{a6}, t_{b6}) - t_0$  Time to Shared Understanding (time to achieve a collective understanding)
- $\text{MAX}(t_{a8}, t_{b8}) - t_0$  Time to make a Shared Decision (joint speed of decision)
- $\text{MAX}(t_{a10}, t_{b10}) - t_0$  Time to Shared Action (joint speed of action)

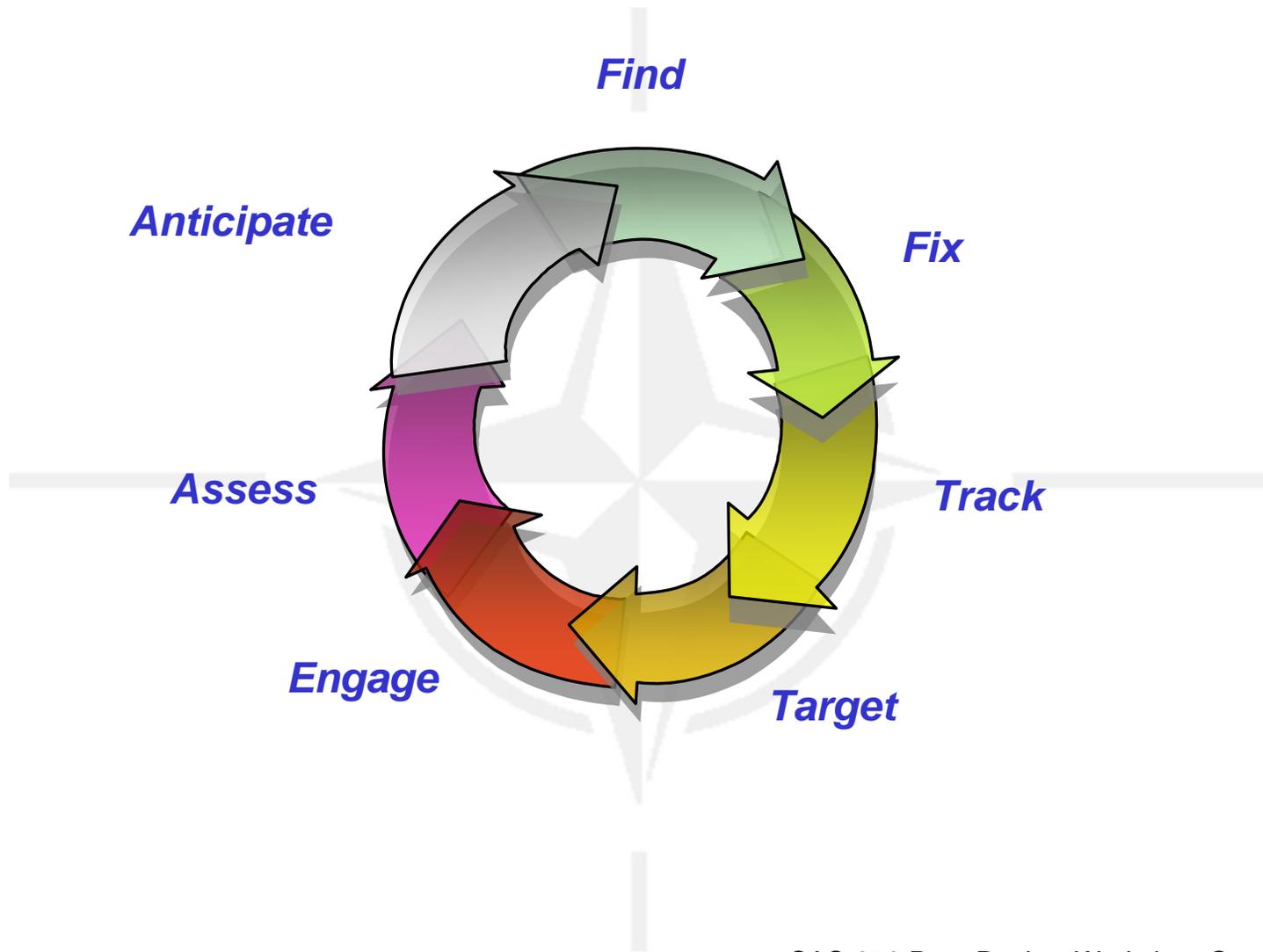
### Definitions:

- $t_0$  Start of particular time reference
- $t_8$  Time collaborative decision is made
- $t_{a8}$  Time entity A decision is made
- $t_{b8}$  Time entity B decision is made
- $t_{a10}$  Time to Action for entity A
- $t_{b10}$  Time to Action for entity B
- $t_{a3} - t_{a0}$  or  $t_{b3} - t_{b0}$  Currency of the data/information
- $\text{MAX}(t_{a3}, t_{b3}) - t_0$  Currency of the shared information
- $\text{MAX}(t_{a5}, t_{b5}) - t_0$  Currency of shared awareness
- $\text{MAX}(t_{a7}, t_{b7}) - t_0$  Currency of shared understanding
- $\text{MAX}(t_{a9}, t_{b9}) - t_0$  Currency of shared decisions
- $\text{MAX}(t_{a10}, t_{b10}) - t_0$  Currency of shared actions

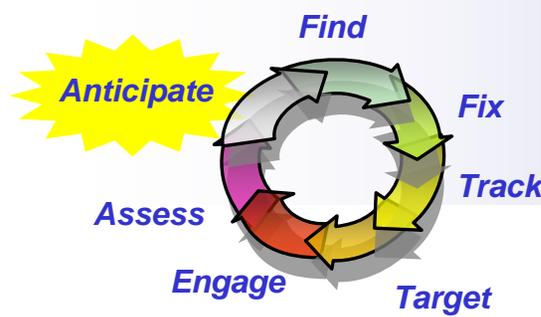
Feedback Loop

# Mapping CM Variables to AF2T2EA Events

As of May 2005



As of May 2005



# “Anticipate” Event

*Atmospheric Weather*  
*Space Weather*  
*Sensor Persistence*  
*Sensor Coverage (Spacial)*  
*Sensor Coverage (Medium)*  
*Sensor Coverage (Spectrum)*

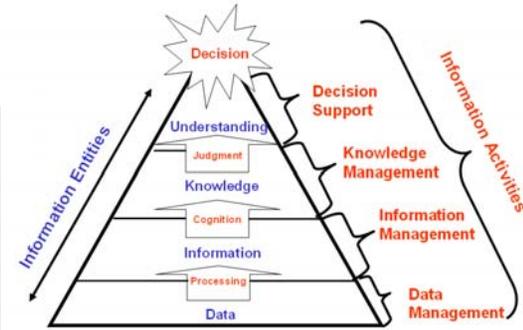
## Environment

<i>Accuracy of Individual Awareness</i>	<i>Collaboration about Intentions</i>
<i>Accuracy of Shared Information</i>	<i>Command Approach</i>
<i>Awareness about Environment</i>	<i>Experience of Personnel</i>
<i>Awareness about Forces</i>	<i>Frequency of Command Interactions</i>
<i>Awareness about Intentions</i>	<i>Frequency of Peer-to-Peer Interactions</i>
<i>Awareness about Mission</i>	<i>History</i>
<i>Collaboration about Environment</i>	<i>Quality of Interactions</i>
<i>Collaboration about Forces</i>	<i>Quality of Peer-to-Peer Interactions</i>

## Awareness

*Understanding about Environment*  
*Understanding about Intentions*

## Understanding



## Information

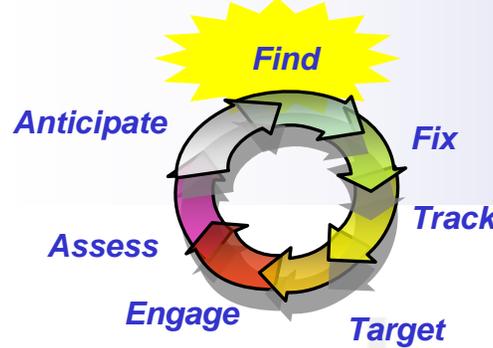
<i>Accuracy</i>	<i>Information about Forces</i>
<i>Completeness of Information</i>	<i>Information about Environment</i>
<i>Completeness of Individual Information</i>	<i>Information about intentions</i>
<i>Completeness of Shared Information</i>	<i>Information Uncertainty</i>
<i>Correctness of Information</i>	<i>Network Reach</i>
<i>Correctness of Individual Information</i>	<i>Precision of Information</i>
<i>Correctness of Shared Information</i>	<i>Precision of Individual Information</i>
<i>Currency of Information</i>	<i>Precision of Shared Information</i>
<i>Currency of Individual Information</i>	<i>Relevance of Shared Information</i>
<i>Currency of Shared Information</i>	<i>Richness of Collaborative Environment</i>
<i>Consistency of Information</i>	<i>Share Information</i>
<i>Consistency of Individual Information</i>	<i>Timeliness of Information</i>
<i>Consistency of Shared Information</i>	<i>Timeliness of Individual Information</i>
<i>Data Interoperability</i>	<i>Timeliness of Shared Information</i>
<i>Distribution of Information</i>	<i>Trust in Information</i>
<i>Extent of Shared Information</i>	<i>Uncertainty</i>
<i>Fusion</i>	<i>Uncertainty of Shared Information</i>
<i>Information Quality</i>	

## Decision

*Accuracy of Individual Decisions*  
*Consistency of Individual Decisions*  
*Completeness of Individual Decisions*  
*Correctness of Individual Decisions*  
*Currency of Individual Decisions*  
*Force Effectiveness*  
*Mode of Decision Making of Individual Decisions*  
*Responsiveness*  
*Precision of Individual Decisions*  
*Quality of Decisions*  
*Relevance of Individual Decisions*  
*Speed of Command*  
*Speed of Decision*  
*Speed of Planning*  
*Synchronization of Actions*  
*Task Speed*  
*Timeliness of Planning*  
*Timeliness of Individual Decisions*  
*Uncertainty of Individual Decisions*

As of May 2005

# “Find” Event



Atmospheric Weather  
Space Weather  
Sensor Persistence  
Sensor Coverage (Spatial)  
Sensor Coverage (Medium)  
Sensor Coverage (Spectrum)

## Environment

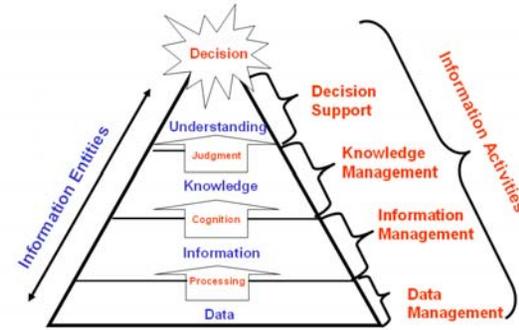
Accuracy of Individual Awareness	Collaboration about Intentions
Accuracy of Shared Information	Command Approach
Awareness about Environment	Experience of Personnel
Awareness about Forces	Frequency of Command Interactions
Awareness about Intentions	Frequency of Peer-to-Peer Interactions
Awareness about Mission	History
Collaboration about Environment	Quality of Interactions
Collaboration about Forces	Quality of Peer-to-Peer Interactions

## Awareness

Understanding about Environment  
Understanding about Intentions

## Understanding Information

Accuracy	Information Quality
Completeness of Information	Information about Forces
Completeness of Individual Information	Information about Environment
Completeness of Shared Information	Information about intentions
Correctness of Information	Information Uncertainty
Correctness of Individual Information	Network Reach
Correctness of Shared Information	Precision of Information
Currency of Information	Precision of Individual Information
Currency of Individual Information	Precision of Shared Information
Currency of Shared Information	Relevance of Shared Information
Consistency of Information	Richness of Collaborative Environment
Consistency of Individual Information	Share Information
Consistency of Shared Information	Timeliness of Information
Data Interoperability	Timeliness of Individual Information
Distribution of Information	Timeliness of Shared Information
Extent of Shared Information	Trust in Information
Fusion	Uncertainty
	Uncertainty of Shared Information



## Decision

Accuracy of Individual Decisions  
Consistency of Individual Decisions  
Completeness of Individual Decisions  
Correctness of Individual Decisions  
Currency of Individual Decisions  
Force Effectiveness  
Mode of Decision Making of Individual Decisions  
Responsiveness  
Precision of Individual Decisions  
Quality of Decisions  
Relevance of Individual Decisions  
Speed of Command  
Speed of Decision  
Speed of Planning  
Synchronization of Actions  
Task Speed  
Timeliness of Planning  
Timeliness of Individual Decisions  
Uncertainty of Individual Decisions

As of May 2005



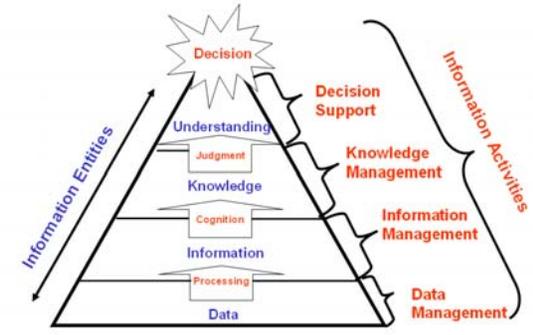
# “Fix” Event

- Analyze
- Network Availability
- Network Reach
- Network Reliability
- Quality of Communications
- Equipment
- Quality of Computing Equipment
- Sensor Coverage (Spatial)
- Sensor Coverage (Medium)
- Sensor Coverage (Spectrum)
- Sensor Persistence

## Environment

- Accuracy of Individual Awareness
- Adaptiveness
- Awareness about Capabilities
- Awareness about Intentions
- Identification
- Level of Confidence
- Task Competence

## Awareness



## Decision

- Command Approach
- Completeness of Individual Decisions
- Identification
- Level of Confidence
- Mission Effectiveness
- Task Competence
- Task Speed

## Information

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Accuracy</li> <li>Authentication</li> <li>Completeness of Information</li> <li>Consistency of Information</li> <li>Consistency of Shared Information</li> <li>Correctness of Information</li> <li>Correctness of Shared Information</li> <li>Currency of Shared Information</li> <li>Distribution of Information</li> <li>Extend of Shared Information</li> <li>Fusion</li> <li>Identification</li> <li>Information About Capabilities</li> </ul> | <ul style="list-style-type: none"> <li>Information Ambiguity</li> <li>Information Complexity</li> <li>Information Quality</li> <li>Information Uncertainty</li> <li>Precision of Individual Information</li> <li>Precision of Information</li> <li>Precision of Shared Information</li> <li>Relevance of Shared Information</li> <li>Share Information</li> <li>Timeliness of Shared Information</li> <li>Timeliness of Individual Information</li> <li>Timeliness of Information</li> <li>Uncertainty of Shared Information</li> </ul> |
|--|---|

## Understanding

- Accuracy of Collective understanding
- Accuracy of Individual Understanding
- Collective Knowledge
- Completeness of Collective Understanding
- Identification
- Level of Confidence

As of May 2005

- Accuracy
- Adaptiveness
- Responsiveness
- Analyze
- Atmospheric Weather
- Dynamics across Time
- Indirect Sensing
- Network Reach
- Robustness
- Sensor Coverage (Medium)
- Sensor coverage (Spacial)
- Sensor Coverage (Spectrum)
- Space Weather

**Environment**  
**Information**

- Accuracy
- Accuracy of Shared Information
- Completeness of Individual Information
- Completeness of Information
- Completeness of Shared Information
- Consistency of Individual Information
- Consistency of Information
- Consistency of Shared Information
- Currency of Shared Information
- Currency of Individual Information
- Currency of Information
- Correctness of Individual Information
- Correctness of Shared Information
- Distribution of Information
- Dynamics across Time
- Extend of Shared Information
- Flexibility
- Fusion
- Information about Environment
- Information about Forces
- Information about Intentions
- Information Quality
- Information Uncertainty
- Precision of Individual Information
- Precision of Information
- Precision of Shared Information
- Relevance of Shared Information
- Shared Understanding
- Timeliness of Shared Information
- Timeliness of Individual Information
- Timeliness of Information
- Uncertainty of Shared Information



<b>Awareness</b>	<b>Target</b>
Accuracy of collective Awareness	Correctness of Collective Awareness
Accuracy of Individual Awareness	Correctness of Individual Awareness
Accuracy of Intersection Awareness	Correctness of Partial Awareness
Accuracy of Partial Awareness	Currency of Collective Awareness
Awareness about Environment	Currency of Individual Awareness
Awareness about Forces	Precision of Individual Awareness
Awareness about Intentions	Timeliness of Collective Awareness
Awareness about Mission	Timeliness of Individual Awareness
Completeness of Individual Awareness	Uncertainty of Collective Awareness
Consistency of Individual Awareness	

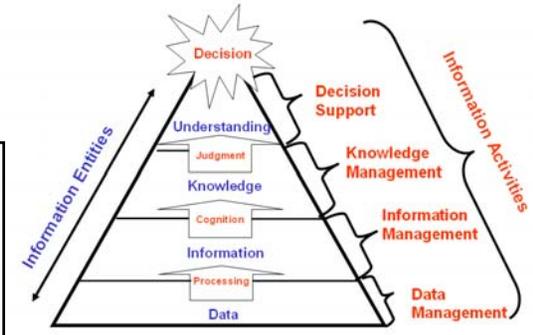
**Understanding**

- Accuracy of Collective Understanding
- Accuracy of Individual Understanding
- Accuracy of Intersection Understanding
- Accuracy of Partial Understanding
- Completeness of Collective Understanding
- Completeness of Individual Understanding
- Completeness of Intersection Understanding
- Completeness of Partial Understanding
- Consistency of Individual Understanding
- Consistency of Intersection Understanding
- Consistency of Collective Understanding
- Correctness of Individual Understanding
- Correctness of Partial Understanding
- Currency of Collective Understanding
- Currency of Individual Understanding
- Extent of collective Understanding
- Extent of Partial Understanding
- Shared Understanding
- Timeliness of Collective Understanding
- Timeliness of Individual Understanding
- Uncertainty of Collective Understanding

**Decision**

- Adaptiveness
- Collaboration about Environment
- Collaboration about Forces
- Collaboration about Intentions
- Collaboration about Mission
- Distribution of Information
- Dynamics across Time
- Experience of Personnel
- Flexibility
- Innovation
- Perception of Cause and Effect
- Quality of Decisions
- Responsiveness
- Robustness
- Speed of Command
- Speed of Planning
- Synchronization of Decisions
- Synchronization of Actions
- Task Competency
- Timeliness of Individual Decisions
- Trust in Information
- Understanding about Environment
- Understanding about Forces / Intentions / Mission
- Analyze
- Command Approach
- History
- Level of Confidence
- Quality of Plan
- Risk Propensity
- Speed of Decision
- Task Speed
- Training

**“Track” Event**



As of May 2005

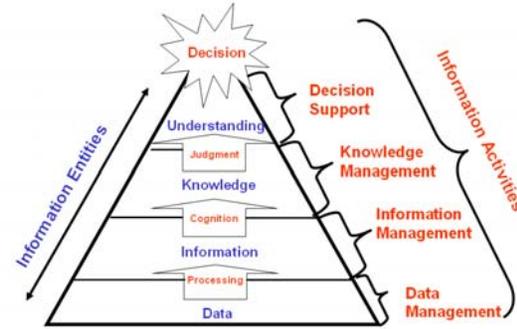
# “Target” Event



Atmospheric Weather  
 Direct Sensing  
 Indirect Sensing  
 Political Situation  
 Sensor Coverage (Medium)  
 Sensor Coverage (Spatial)  
 Sensor Coverage (Spectrum)  
 Sensor Persistence  
 Social Situation  
 Space Weather

Accuracy of Collective Awareness  
 Accuracy of Intersection Awareness  
 Awareness about Capabilities  
 Awareness about Environment  
 Awareness about Forces  
 Awareness about Intentions  
 Awareness about Mission

**Awareness**



**Environment**

Quality of Understanding

**Understanding**

**Decision**

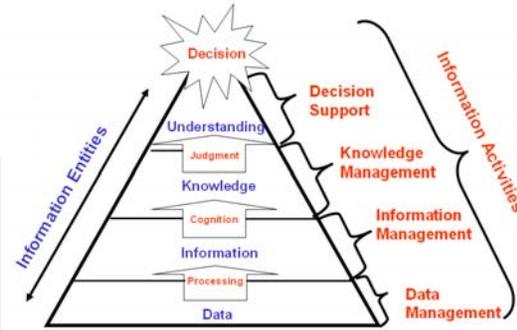
**Information**

Completeness of Information	Information about Mission
Completeness of Shared Information	Information Quality
Consistency of Information	Information Uncertainty
Consistency of Shared Information	Precision of Individual Information
Correctness of Individual Information	Precision of Information
Correctness of Shared Information	Precision of Shared Information
Currency of Individual Information	Relevance of Shared Information
Currency of Information	Share Information
Currency of Shared Information	Timeliness of Shared Information
Data Interoperability	Timeliness of Individual Information
Distribution of Information	Timeliness of Information
Extent of Shared Information	Trust in Information
Information about Environment	Uncertainty of Shared Information
Information about Forces	

Accuracy of Individual Decisions	Quality of Decisions
Appropriateness of Individual Decisions	Quality of Plan
Authentication	Resource Allocation
Command Approach	Resource Prioritization
Communication of Intent	Responsiveness
Constraint Enforcement	Risk Propensity
Constraint Setting	Robustness
Decision Participants	Role of Authority
Degree of Decision Concurrence	Skill
Dynamics across time	Task Speed
Experience of Personnel	Social Situation
Force Effectiveness	Speed of Command
Indirect Sensing	Synchronization
Individual Task Efficiency	Synchronization of Actions
Lethal Effectors	Task Competence
Likelihood of Success	Task Efficiency
Mission Effectiveness	Task Knowledge
Nature of Rules	Timeliness of Individual Decisions
Non-Lethal Effectors	Training
Political Situation	Trust in Information
	Uncertainty of Individual Decisions
	Willingness

As of May 2005

# “Engage” Event



Atmospheric Weather  
 Communications Interoperability  
 Complicated-ness  
 Data Interoperability  
 Network Availability  
 Network Reach  
 Network Reliability  
 Network Richness  
 Political situation  
 Quality of communications Equipment  
 Quality of Computing Equipment  
 electivity  
 Social Situation

**Awareness**

<i>Awareness about Capabilities</i>	<i>Awareness about Environment</i>
<i>Awareness about Forces</i>	<i>Awareness about Intentions</i>
<i>Awareness about Mission</i>	<i>Completeness of Individual Awareness</i>
<i>Correctness of Collective Awareness</i>	<i>Currency of Collective Awareness</i>
<i>Currency of Individual Awareness</i>	<i>Shared Awareness (intersection)</i>

**Understanding**

*Completeness of Collective Understanding*  
*Correctness of Collective Understanding*  
*Currency of Collective Understanding*  
*Quality of Understanding*  
*Uncertainty of Individual Understanding*

**Environment**

**Information**

**Decision**

*Completeness of Individual Information*  
*Completeness of Shared Information*  
*Correctness of Information*  
*Correctness of Shared Information*  
*Currency of Individual Information*  
*Currency of Information*  
*Currency of Shared Information*  
*Distribution of Information*  
*Extent of Shared Information*  
*Information about Environment*  
*Information about Forces*  
*Information about Intentions*  
*Information about Mission*  
*Information Quality*  
*Precision of Individual Information*  
*Precision of Information*  
*Relevance of shared Information*  
*Timeliness of Shared Information*

*Timeliness of Information*  
*Trust in Information*  
*Uncertainty of Shared Information*

<i>Accuracy</i>	<i>Adaptiveness</i>	<i>Authentication</i>
<i>C2 Doctrine</i>	<i>Clarity about roles</i>	<i>Command Approach</i>
<i>Command Arrangements</i>	<i>Communication of Intent</i>	<i>Constraint Enforcement</i>
<i>Constraint Setting</i>	<i>Control Approach</i>	<i>Criticality</i>
<i>Dynamics across Time</i>	<i>Experience of Personnel</i>	<i>Force Will</i>
<i>Extent of Shared Information</i>	<i>Identification</i>	<i>Leadership</i>
<i>Lethal effectors</i>	<i>Level of Confidence</i>	<i>Likelihood of Success</i>
<i>Mission Effectiveness</i>	<i>Mobility</i>	<i>Nature of Rules</i>
<i>Non-Lethal Effectors</i>	<i>Political situation</i>	<i>Resource Allocation</i>
<i>Perception of Cause and Effect</i>	<i>Trust in Information</i>	<i>Trust in People</i>
<i>Resource Prioritization</i>	<i>Responsiveness</i>	<i>Role of Authority</i>
<i>Risk Propensity</i>	<i>Robustness</i>	<i>Role of Emotion</i>
<i>Selectivity</i>	<i>Skill</i>	<i>Sleep Deprivation</i>
<i>Social Situation</i>	<i>Speed of Command</i>	<i>Speed of Decision</i>
<i>State of Mental Health</i>	<i>State of Physical Health</i>	<i>Stress Level</i>
<i>Synchronization</i>	<i>Synchronization of Actions</i>	<i>Task Competence</i>
<i>Task Efficiency</i>	<i>Task Knowledge</i>	<i>Task Speed</i>
<i>Team Culture</i>	<i>Team Decisions</i>	<i>Training</i>
<i>Willingness</i>		

As of May 2005

Collective Knowledge  
 Constraint Enforcement  
 Constraint Setting  
 Experience of Personnel  
 History  
 Identification  
 Lethal Effectors  
 Non-Lethal Effectors  
 Number of Mental Models  
 Policy Effectiveness  
 Political Situation  
 Social Situation  
 Stress Level  
 Team Culture  
 Team Sensemaking Behavior  
 Uncertainty

**Environment**

**Information**

Accuracy of Shared Information  
 Completeness of Individual Information  
 Completeness of Shared Information  
 Correctness of Individual Information  
 Correctness of Information  
 Correctness of Shared Information  
 Currency of Information  
 Currency of Shared Information  
 Extent of Shared Information  
 Fusion  
 Information About Capabilities  
 Information about Environment  
 Information about Forces  
 Information about Intentions

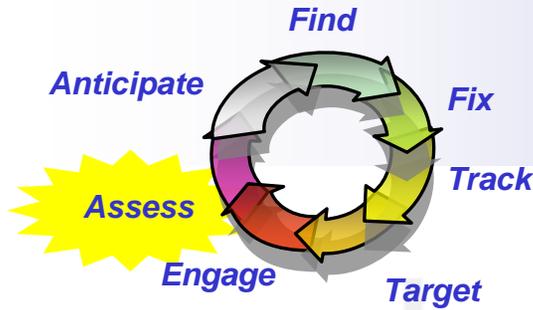
Information about Mission  
 Information Ambiguity  
 Information Complexity  
 Information Quality  
 Information Uncertainty  
 Precision of Individual Information  
 Precision of Information  
 Precision of Shared Information  
 Relevance of Shared Information  
 Timeliness of Shared Information  
 Timeliness of Information  
 Trust in Information  
 Uncertainty of Shared Information

Accuracy of Collective Understanding  
 Accuracy of Individual Understanding  
 Accuracy of Intersection Understanding  
 Accuracy of Partial Understanding  
 Completeness of Collective Understanding  
 Completeness of Individual Understanding  
 Completeness of Partial Understanding  
 Correctness of Collective Understanding  
 Correctness of Individual Understanding  
 Correctness of Intersection Understanding  
 Correctness of Partial Understanding  
 Extent of Collective Understanding  
 Extent of Intersection Understanding  
 Extent of Partial Understanding  
 Precision of Collective Understanding  
 Precision of Individual Understanding  
 Understanding about Capabilities  
 Understanding about Environment  
 Understanding about Forces / Intentions / Mission

**Understanding**

Analyze  
 Assessment  
 Constraint Enforcement  
 Constraint Setting  
 Discovery  
 Identification  
 Innovation  
 Level of Confidence  
 Likelihood of Success  
 Mission Effectiveness  
 Non-Lethal Effectors  
 Persistence  
 Stress Level  
 Task Competence  
 Task Efficiency  
 Task Knowledge  
 Task Speed

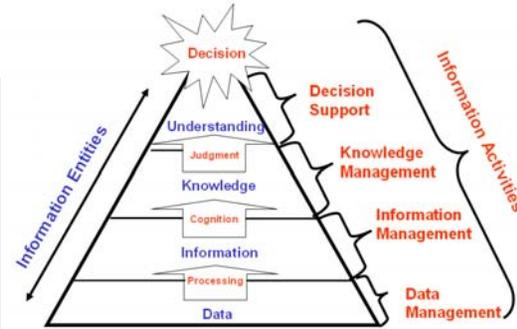
**Decision**



Accuracy of Collective Awareness	Accuracy of Individual Awareness
Accuracy of Intersection Awareness	Accuracy of Partial Awareness
Awareness about Capabilities	Awareness about Environment
Awareness about Forces	Awareness about Intentions
Awareness about Mission	Completeness of Individual Awareness
Correctness of Collective Awareness	Correctness of Individual Awareness
Correctness of Intersection Awareness	Correctness of Partial Awareness
Precision of Collective Awareness	Precision of Individual Awareness

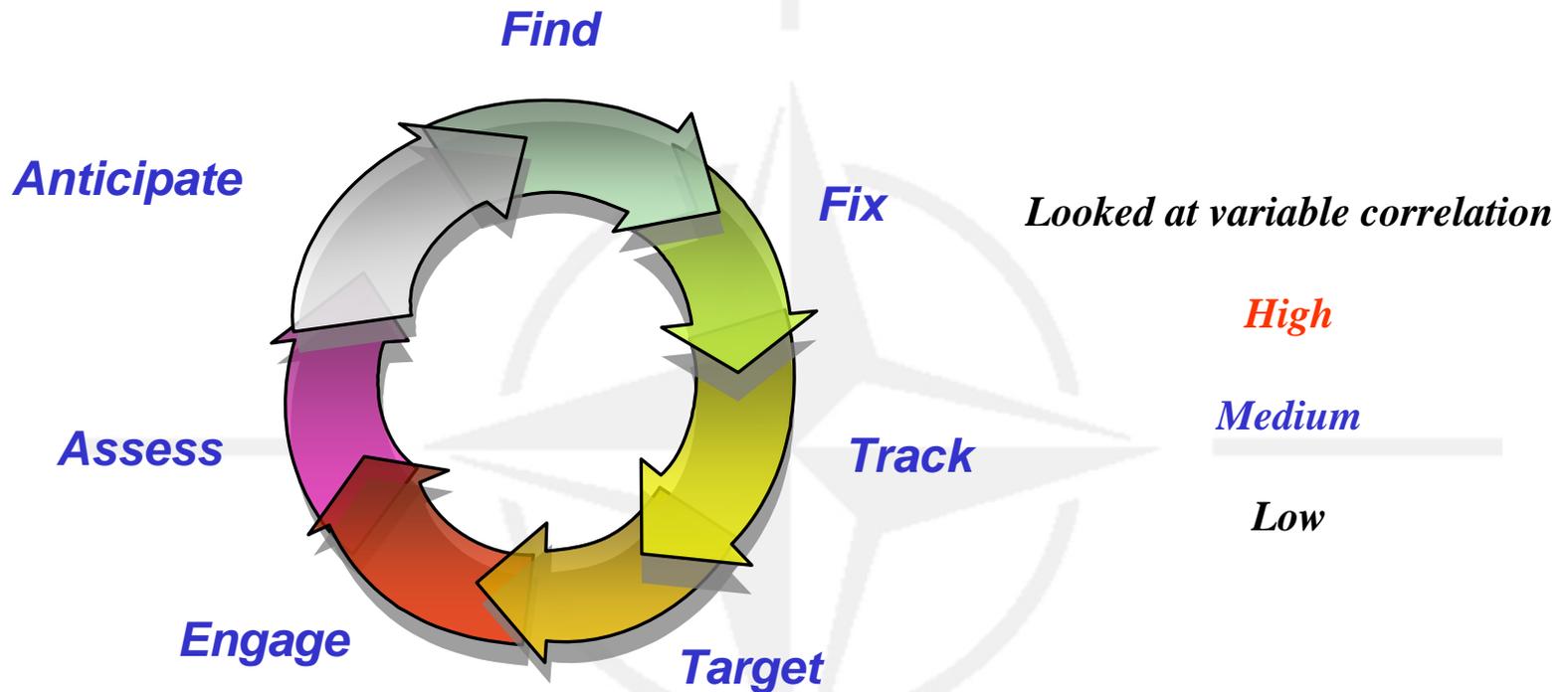
**Awareness**

# “Assess” Event

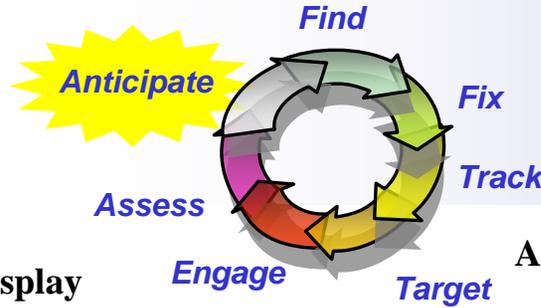


# Mapping CM Variables to AF2T2EA Value

As of May 2005



As of May 2005



# “Anticipate” Capabilities

Ability to model, predict and display possible effects, warn, and report CBRNE and TIM threats

<i>Atmospheric Weather</i>	<i>Space Weather</i>
<i>Sensor Persistence</i>	<i>Understanding about Intentions</i>
<i>Sensor Coverage (Spacial)</i>	<i>Sensor Coverage (Medium)</i>
<i>Sensor Coverage (Spectrum)</i>	<i>Understanding about Environment</i>

Anticipate adversary’s action(s) in order to streamline and shorten Find, Fix, Track, Target, Engage, and Assess (F2T2EA) cycle

- Experience of Personnel*
- Frequency of Command Interactions*
- Frequency of Peer-to-Peer Interactions*
- History*
- Quality of Interactions*
- Quality of Peer-to-Peer Interactions*
- Accuracy of Individual Awareness*
- Accuracy of Shared Information*
- Awareness about Environment*
- Awareness about Forces*
- Awareness about Intentions*
- Awareness about Mission*
- Collaboration about Environment*
- Collaboration about Forces*
- Collaboration about Intentions*
- Command Approach*
- Task Speed*
- Timeliness of Planning*
- Timeliness of Individual Decisions*
- Uncertainty of Individual Decisions*

- Accuracy of Individual Decisions*
- Consistency of Individual Decisions*
- Completeness of Individual Decisions*
- Correctness of Individual Decisions*
- Currency of Individual Decisions*
- Force Effectiveness*
- Mode of Decision Making of Individual Decisions*
- Responsiveness*
- Precision of Individual Decisions*
- Quality of Decisions*
- Relevance of Individual Decisions*
- Speed of Command*
- Speed of Decision*
- Speed of Planning*
- Synchronization of Actions*

*High Correlation*  
*Med Correlation*  
*Low Correlation*  
to  
“Anticipate”

Predict how actions (Red, Blue, Gray) will cascade into direct and indirect effects in support of effects-based operations

<i>Accuracy</i>	<i>Information Quality</i>
<i>Completeness of Information</i>	<i>Information about Forces</i>
<i>Completeness of Individual Information</i>	<i>Information about Environment</i>
<i>Completeness of Shared Information</i>	<i>Information about intentions</i>
<i>Correctness of Information</i>	<i>Information Uncertainty</i>
<i>Correctness of Individual Information</i>	<i>Network Reach</i>
<i>Correctness of Shared Information</i>	<i>Precision of Information</i>
<i>Currency of Information</i>	<i>Precision of Individual Information</i>
<i>Currency of Individual Information</i>	<i>Precision of Shared Information</i>
<i>Currency of Shared Information</i>	<i>Relevance of Shared Information</i>
<i>Consistency of Information</i>	<i>Richness of Collaborative Environment</i>
<i>Consistency of Individual Information</i>	<i>Share Information</i>
<i>Consistency of Shared Information</i>	<i>Timeliness of Information</i>
<i>Distribution of Information</i>	<i>Timeliness of Individual Information</i>
	<i>Timeliness of Shared Information</i>
	<i>Trust in Information</i>
	<i>Uncertainty</i>
	<i>Uncertainty of Shared Information</i>
	<i>Data Interoperability</i>
	<i>Fusion</i>
	<i>Extent of Shared Information</i>

Ability to model and predict CBRNE and TIM threats and events

<i>Atmospheric Weather</i>	<i>Space Weather</i>
<i>Sensor Persistence</i>	<i>Understanding about Intentions</i>
<i>Sensor Coverage (Spacial)</i>	<i>Sensor Coverage (Medium)</i>
<i>Sensor Coverage (Spectrum)</i>	<i>Understanding about Environment</i>

As of May 2005



# “Find” Capabilities

**Fully merge and integrate sensor/information to support battlespace situational awareness**

- Atmospheric Weather*
- Space Weather*
- Sensor Persistence*
- Sensor Coverage (Spacial)*
- Sensor Coverage (Medium)*
- Sensor Coverage (Spectrum)*

- Frequency of Command Interactions*
- Frequency of Peer-to-Peer Interactions*
- History*
- Quality of Interactions*
- Quality of Peer-to-Peer Interactions*
- Collaboration about Environment*
- Command Approach*

**Accurate and real-time situational awareness of the battlespace to enable decision makers to correctly react to dynamic changes**

- Command Approach*
- Experience of Personnel*
- Accuracy of Individual Decisions*
- Consistency of Individual Decisions*
- Completeness of Individual Decisions*
- Correctness of Individual Decisions*
- Currency of Individual Decisions*
- Force Effectiveness*
- Mode of Decision Making of Individual Decisions*
- Responsiveness*
- Precision of Individual Decisions*
- Quality of Decisions*
- Relevance of Individual Decisions*
- Speed of Command*
- Speed of Planning*
- Task Speed*
- Timeliness of Planning*
- Timeliness of Individual Decisions*
- Uncertainty of Individual Decisions*
- Awareness about Environment*
- Awareness about Forces*
- Awareness about Intentions*
- Awareness about Mission*
- Accuracy of Individual Awareness*
- Accuracy of Shared Information*
- Collaboration about Forces*
- Collaboration about Intentions*
- Command Approach*

*Speed of Decision*  
*Synchronization of Actions*

**High Correlation**  
**Med Correlation**  
**Low Correlation**  
to  
**“Find”**

**Rapidly and accurately updated situational understanding as a result of changes in situational awareness**

- Experience of Personnel*
- Accuracy*
- Completeness of Information*
- Completeness of Individual Information*
- Completeness of Shared Information*
- Correctness of Information*
- Correctness of Individual Information*
- Correctness of Shared Information*
- Currency of Information*
- Currency of Individual Information*
- Currency of Shared Information*
- Consistency of Information*
- Consistency of Individual Information*
- Consistency of Shared Information*
- Data Interoperability*
- Distribution of Information*
- Extent of Shared Information*
- Fusion*

- Information Quality*
- Information about Forces*
- Information about Environment*
- Information about intentions*
- Information Uncertainty*
- Network Reach*
- Precision of Information*
- Precision of Individual Information*
- Precision of Shared Information*
- Relevance of Shared Information*
- Richness of Collaborative Environment*
- Share Information*
- Timeliness of Information*
- Timeliness of Individual Information*
- Timeliness of Shared Information*
- Trust in Information*
- Uncertainty*
- Uncertainty of Shared Information*

As of May 2005



# “Fix” Capabilities

Accurate and timely positive combat identification of ground, air, and space objects

Analyze  
 Network Availability  
 Network Reach  
 Network Reliability  
 Quality of Communications  
 Equipment  
 Quality of Computing Equipment  
 Sensor Coverage (Spatial)  
 Sensor Coverage (Medium)  
 Sensor Coverage (Spectrum)  
 Sensor Persistence

Accuracy of Individual Awareness  
 Adaptiveness  
 Awareness about Capabilities  
 Awareness about Intentions  
 Task Competence

Accuracy of Collective understanding  
 Accuracy of Individual Understanding  
 Collective Knowledge  
 Completeness of Collective Understanding  
 Identification  
 Level of Confidence

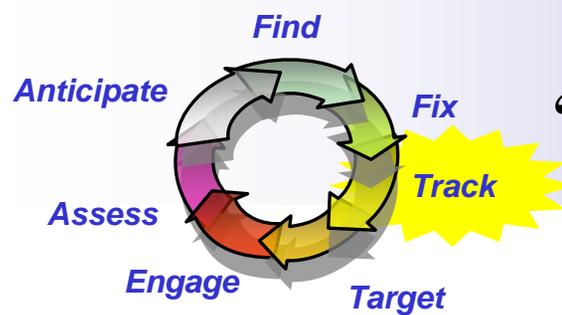
Accuracy  
 Authentication  
 Completeness of Information  
 Consistency of Information  
 Consistency of Shared Information  
 Correctness of Information  
 Correctness of Shared Information  
 Currency of Shared Information  
 Distribution of Information  
 Extend of Shared Information  
 Fusion  
 Identification  
 Information About Capabilities

Information Ambiguity  
 Information Complexity  
 Information Quality  
 Information Uncertainty  
 Precision of Individual Information  
 Precision of Information  
 Precision of Shared Information  
 Relevance of Shared Information  
 Share Information  
 Timeliness of Shared Information  
 Timeliness of Individual Information  
 Timeliness of Information  
 Uncertainty of Shared Information

Command Approach  
 Completeness of Individual Decisions  
 Mission Effectiveness  
 Task Competence  
 Task Speed

High Correlation  
 Med Correlation  
 Low Correlation  
 to  
 “Fix”

As of May 2005



# “Track” Capabilities

Integration and display of operations information in a common operational picture available to entire network

*Accuracy*      *Adaptiveness*  
*Analyze*  
*Atmospheric Weather*  
*Dynamics across Time*  
*History*      *Indirect Sensing*  
*Network Reach*      *Responsiveness*  
*Robustness*  
*Accuracy of Shared Information*  
*Completeness of Individual Information*  
*Completeness of Information*  
*Completeness of Shared Information*  
*Consistency of Individual Information*  
*Consistency of Information*  
*Consistency of Shared Information*  
*Correctness of Individual Information*  
*Correctness of Shared Information*  
*Currency of Individual Information*  
*Currency of Information*  
*Currency of Shared Information*  
*Distribution of Information*  
*Dynamics across Time*

*Accuracy of collective Awareness*  
*Accuracy of Individual Awareness*  
*Accuracy of Intersection Awareness*  
*Accuracy of Partial Awareness*  
*Awareness about Environment*  
*Awareness about Forces*  
*Awareness about Intentions*  
*Awareness about Mission*  
*Completeness of Individual Awareness*  
*Consistency of Individual Awareness*  
*Correctness of Collective Awareness*  
*Correctness of Individual Awareness*  
*Correctness of Partial Awareness*  
*Currency of Collective Awareness*  
*Currency of Individual Awareness*  
*Precision of Individual Awareness*  
*Timeliness of Collective Awareness*  
*Timeliness of Individual Awareness*  
*Uncertainty of Collective Awareness*

*Accuracy of Collective Understanding*  
*Accuracy of Individual Understanding*  
*Accuracy of Intersection Understanding*  
*Accuracy of Partial Understanding*  
*Completeness of Collective Understanding*  
*Completeness of Individual Understanding*  
*Completeness of Intersection Understanding*  
*Completeness of Partial Understanding*  
*Consistency of Individual Understanding*  
*Consistency of Intersection Understanding*  
*Consistency of Partial Understanding*  
*Correctness of Collective Understanding*  
*Correctness of Individual Understanding*  
*Correctness of Partial Understanding*  
*Currency of Collective Understanding*  
*Currency of Individual Understanding*  
*Extent of collective Understanding*  
*Extent of Partial Understanding*  
*Shared Understanding*  
*Timeliness of Collective Understanding*  
*Timeliness of Individual Understanding*  
*Uncertainty of Collective Understanding*

*Extend of Shared Information*  
*Flexibility*  
*Fusion*  
*Information about Environment*  
*Information about Forces*  
*Information about Intentions*  
*Information Quality*  
*Information Uncertainty*  
*Precision of Individual Information*  
*Precision of Information*  
*Precision of Shared Information*  
*Relevance of Shared Information*  
*Shared Understanding*  
*Timeliness of Shared Information*  
*Timeliness of Individual Information*  
*Timeliness of Information*  
*Uncertainty of Shared Information*

Improve, automate, and streamline monitoring of friendly air and space force location

*Adaptiveness*  
*Analyze*  
*Collaboration about Environment*  
*Collaboration about Forces*  
*Collaboration about Intentions*  
*Collaboration about Mission*  
*Command Approach*  
*Distribution of Information*  
*Dynamics across Time*  
*Experience of Personnel*

*Responsiveness*  
*Risk Propensity*  
*Robustness*  
*Speed of Command*  
*Speed of Decision*  
*Speed of Planning*  
*Synchronization of Decisions*  
*Synchronization of Actions*  
*Task Competency*  
*Task Speed*

*Timeliness of Individual Decisions*  
*Training*  
*Trust in Information*  
*Mobility*  
*Understanding about Environment*  
*Understanding about Forces*  
*Understanding about Intentions*  
*Understanding about Mission*  
*Flexibility*

*History*  
*Innovation*  
*Level of Confidence*  
*Perception of Cause and Effect*  
*Quality of Decisions*  
*Quality of Plan*  
*Sensor Coverage (Medium)*  
*Sensor coverage (Spacial)*  
*Sensor Coverage (Spectrum)*  
*Space Weather*

**High Correlation**  
**Med Correlation**  
**Low Correlation**  
 to  
**“Track”**

As of May 2005



# “Target” Capabilities

## Improve Commander’s COA selection and dissemination process

*Atmospheric Weather*  
*Direct Sensing*  
*Indirect Sensing*  
*Political Situation*  
*Sensor Coverage (Medium)*  
*Sensor Coverage (Spacial)*  
*Sensor Coverage (Spectrum)*  
*Sensor Persistence*  
*Social Situation*  
*Space Weather*

*313 – Information about Mission*  
*129 – Information Quality*  
*272 – Information Uncertainty*  
*283 – Precision of Individual Information*  
*133 – Precision of Information*  
*290 – Precision of Shared Information*  
*293 – Relevance of Shared Information*  
*202 – Share Information*  
*294 – Timeliness of Shared Information*  
*284 – Timeliness of Individual Information*  
*134 – Timeliness of Information*  
*89 – Trust in Information*  
*295 – Uncertainty of Shared Information*

*Quality of Decisions*  
*Quality of Plan*  
*Resource Allocation*  
*Resource Prioritization*  
*Responsiveness*  
*Risk Propensity*  
*Robustness*  
*Role of Authority*  
*Skill*  
*Speed of Command*  
*Synchronization*  
*Synchronization of Actions*  
*Task Competence*  
*Task Efficiency*  
*Task Knowledge*  
*Task Speed*  
*Timeliness of Individual Decisions*  
*Training*  
*Uncertainty of Individual Decisions*  
*Willingness*

*Accuracy of Individual Decisions*  
*Appropriateness of Individual Decisions*  
*Authentication*  
*C2 Doctrine*  
*Command Approach*  
*Communication of Intent*  
*Constraint Enforcement*  
*Constraint Setting*  
*Control Approach*  
*Criticality*  
*Decision Participants*  
*Degree of Decision Concurrence*  
*Dynamics across time*  
*Experience of Personnel*  
*Flexibility*  
*Force Effectiveness*  
*Identification*  
*Individual Task Efficiency*  
*Lethal Effectors*  
*Likelihood of Success*  
*Mission Effectiveness*  
*Nature of Rules*  
*Non-Lethal Effectors*  
*Political Situation*

*129 – Completeness of Information*  
*291 – Completeness of Shared Information*  
*282 – Consistency of Information*  
*288 – Consistency of Shared Information*  
*280 – Correctness of Individual Information*  
*287 – Correctness of Shared Information*  
*281 – Currency of Individual Information*  
*131 – Currency of Information*  
*289 – Currency of Shared Information*  
*264 – Data Interoperability*  
*13 – Distribution of Information*  
*286 – Extent of Shared Information*  
*312 – Information about Environment*  
*311 – Information about Forces*

*Accuracy of Collective Awareness*  
*Accuracy of Intersection Awareness*  
*Awareness about Capabilities*  
*Awareness about Environment*  
*Awareness about Forces*  
*Awareness about Intentions*  
*Awareness about Mission*

**High Correlation**  
**Med Correlation**  
**Low Correlation**  
**to**  
**“Target”**

# “Engage” Capabilities

As of May 2005



## Better optimized use of the battlespace environment

*Atmospheric Weather*  
*Space Weather*  
*Direct Sensing*  
*Indirect Sensing*  
*Communications Interoperability*  
*Complicated-ness*  
*Data Interoperability*

*Network Availability*  
*Network Reach*  
*Network Reliability*  
*Network Richness*  
*Political situation*  
*Quality of communications Equipment*  
*Quality of Computing Equipment*  
*Selectivity*  
*Social Situation*

## Conduct real-time effects-based mission execution

*Awareness about Capabilities*  
*Awareness about Environment*  
*Awareness about Forces*  
*Awareness about Intentions*  
*Awareness about Mission*  
*Completeness of Individual Awareness*  
*Correctness of Collective Awareness*  
*Currency of Collective Awareness*  
*Currency of Individual Awareness*  
*Shared Awareness (intersection)*

## Real-time collaboration among all C2 entities

*Completeness of Individual Information*  
*Completeness of Shared Information*  
*Correctness of Information*  
*Correctness of Shared Information*  
*Currency of Individual Information*  
*Currency of Information*  
*Currency of Shared Information*  
*Distribution of Information*  
*Extent of Shared Information*  
*Information about Environment*  
*Information about Forces*  
*Information about Intentions*  
*Information about Mission*  
*Information Quality*  
*Precision of Individual Information*  
*Precision of Information*  
*Relevance of shared Information*  
*Timeliness of Shared Information*  
*Timeliness of Information*  
*Trust in Information*  
*Uncertainty of Shared Information*

## Capability to achieve self-synchronization of forces

*Accuracy*  
*Adaptiveness*  
*Authentication*  
*C2 Doctrine*  
*Clarity about roles*  
*Command Approach*  
*Command Arrangements*  
*Communication of Intent*  
*Constraint Enforcement*  
*Constraint Setting*  
*Control Approach*  
*Criticality*  
*Dynamics across Time*  
*Experience of Personnel*  
*Extent of Shared Information*  
*Force Will*  
*Identification*  
*Leadership*  
*Lethal effectors*  
*Level of Confidence*  
*Likelihood of Success*  
*Mission Effectiveness*

*Resource Prioritization*  
*Responsiveness*  
*Role of Authority*  
*Risk Propensity*  
*Robustness*  
*Role of Emotion*  
*Selectivity*  
*Skill*  
*Sleep Deprivation*  
*Social Situation*  
*Speed of Command*  
*Speed of Decision*  
*State of Mental Health*  
*State of Physical Health*  
*Stress Level*  
*Synchronization*  
*Synchronization of Actions*  
*Task Competence*  
*Task Efficiency*  
*Task Knowledge*  
*Task Speed*

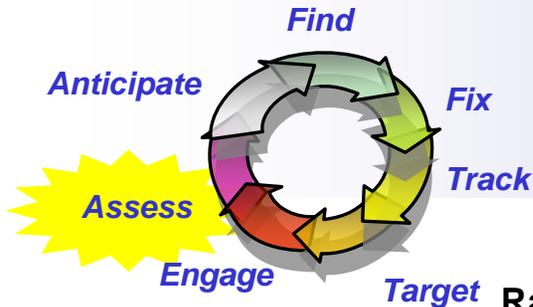
*Completeness of Collective Understanding*  
*Correctness of Collective Understanding*  
*Currency of Collective Understanding*  
*Quality of Understanding*  
*Uncertainty of Individual Understanding*  
*Trust in People*  
*Willingness*  
*Perception of Cause and Effect*  
*Political situation*  
*Resource Allocation*  
*Training*  
*Trust in Information*  
*Mobility*  
*Nature of Rules*  
*Team Culture*  
*Team Decisions*

*High Correlation*  
*Med Correlation*  
*Low Correlation*  
*to*

*“Engage”*

# “Assess” Capabilities

As of May 2005



**Real-time Red, Blue Gray force status assessment**

**Rapid assessment and selection of targets to maximize desired effects**

**Improve COA evaluation and requirements process**

<i>Collective Knowledge</i>	<i>Accuracy of Collective Awareness</i>
<i>Constraint Enforcement</i>	<i>Accuracy of Individual Awareness</i>
<i>Constraint Setting</i>	<i>Accuracy of Intersection Awareness</i>
<i>Experience of Personnel</i>	<i>Accuracy of Partial Awareness</i>
<i>History</i>	<i>Awareness about Capabilities</i>
<i>Identification</i>	<i>Awareness about Environment</i>
<i>Lethal Effectors</i>	<i>Awareness about Forces</i>
<i>Non-Lethal Effectors</i>	<i>Awareness about Intentions</i>
<i>Number of Mental Models</i>	<i>Awareness about Mission</i>
<i>Policy Effectiveness</i>	<i>Completeness of Individual Awareness</i>
<i>Political Situation</i>	<i>Correctness of Collective Awareness</i>
<i>Social Situation</i>	<i>Correctness of Individual Awareness</i>
<i>Stress Level</i>	<i>Correctness of Intersection Awareness</i>
<i>Team Culture</i>	<i>Correctness of Partial Awareness</i>
<i>Team Sensemaking Behavior</i>	<i>Precision of Collective Awareness</i>
<i>Uncertainty</i>	<i>Precision of Individual Awareness</i>

<i>Analyze</i>
<i>Assessment</i>
<i>Constraint Enforcement</i>
<i>Constraint Setting</i>
<i>Discovery</i>
<i>Identification</i>
<i>Innovation</i>
<i>Level of Confidence</i>
<i>Likelihood of Success</i>
<i>Mission Effectiveness</i>
<i>Lethal Effectors</i>
<i>Non-Lethal Effectors</i>
<i>Persistence</i>
<i>Stress Level</i>
<i>Task Competence</i>
<i>Task Efficiency</i>
<i>Task Knowledge</i>
<i>Task Speed</i>

<i>Accuracy of Collective Understanding</i>
<i>Accuracy of Individual Understanding</i>
<i>Accuracy of Intersection Understanding</i>
<i>Accuracy of Partial Understanding</i>
<i>Completeness of Collective Understanding</i>
<i>Completeness of Individual Understanding</i>
<i>Completeness of Partial Understanding</i>
<i>Correctness of Collective Understanding</i>
<i>Correctness of Individual Understanding</i>
<i>Correctness of Intersection Understanding</i>
<i>Correctness of Partial Understanding</i>
<i>Extent of Collective Understanding</i>
<i>Extent of Intersection Understanding</i>
<i>Extent of Partial Understanding</i>
<i>Precision of Collective Understanding</i>
<i>Precision of Individual Understanding</i>
<i>Understanding about Capabilities</i>
<i>Understanding about Environment</i>
<i>Understanding about Forces</i>
<i>Understanding about Intentions</i>
<i>Understanding about Mission</i>

**Ability to accurately assess air and space operational impacts of physical environmental conditions**

<i>Accuracy of Shared Information</i>	<i>Information about Mission</i>
<i>Completeness of Individual Information</i>	<i>Information Ambiguity</i>
<i>Completeness of Shared Information</i>	<i>Information Complexity</i>
<i>Correctness of Individual Information</i>	<i>Information Quality</i>
<i>Correctness of Information</i>	<i>Information Uncertainty</i>
<i>Correctness of Shared Information</i>	<i>Precision of Individual Information</i>
<i>Currency of Information</i>	<i>Precision of Information</i>
<i>Currency of Shared Information</i>	<i>Precision of Shared Information</i>
<i>Extent of Shared Information</i>	<i>Relevance of Shared Information</i>
<i>Fusion</i>	<i>Timeliness of Shared Information</i>
<i>Information About Capabilities</i>	<i>Timeliness of Information</i>
<i>Information about Environment</i>	<i>Trust in Information</i>
<i>Information about Forces</i>	<i>Uncertainty of Shared Information</i>
<i>Information about Intentions</i>	

**High Correlation**  
**Med Correlation**  
**Low Correlation**  
 to  
**“Assess”**